

# CLAW AMPUTATION



**Lambert, Leonard and May**  
Nantwich, Cheshire

## Claw Amputation Case Study

Sara Pedersen - Lambert, Leonard and May

**Background to the Study:** Lameness not only has a detrimental effect on the productivity of cattle but it also has serious welfare implications. This is because it is both a considerable source of pain and probably the most common cause of distress in dairy cattle. Lameness is also fast becoming a very hot topic with more and more milk buyers requesting some degree of lameness monitoring in their contracts.

Claw disorders account for 90% of lameness cases in dairy cattle, the majority of which are infectious in origin. The hind claws are most frequently involved, with the hind outer claw affected in up to 85% of cases.

The most common indications for claw amputation are necrotic toe, infected solar ulcer and white line disease. Once infection has entered the claw, either via the sole, wall or interdigital space, unless dealt with quickly, it invariably spreads to surrounding structures. At this stage, once infection has entered the joint, the treatment options are limited: 1) Immediate slaughter 2) Amputation of the claw 3) Digit salvage technique e.g. 'coring'.

With the rise in replacement costs, farmers are keener than ever to retain a cow in the herd and avoid culling her. As a result we have seen a rise in the number of claw amputations being undertaken. But is it worth it?

### Study Outline:

95 cows that had undergone claw amputation between 1st January 2000 and 30th June 2007 were included in the study. All 'amputees' were matched with a 'control' in the herd that was of similar parity, stage of lactation and production level. 44 farms were included in total. All cows recruited were followed until the 31st July 2007 and their cull date recorded if they left the herd before this date.

### Results:

Amputation was performed at all stages of lactation and age at amputation ranged from 0-11th lactation. 69% of claws removed were hind claws with 53% of all claws removed being hind outer.

Comparison of 'amputees' and 'controls' showed no difference in survival at 100 days

and 365 days postamputation. 54% of amputees completed their next lactation.

Long term survival (years) in the herd was dependent on whether it was a front or hind claw that was removed. Cows that had a front claw removed survived in the herd just as long as their matched herdmates (median survival of 36.6 months). However, cows that had a hind claw removed did not survive as long in comparison with a median survival of 26.2 months.

One cow underwent amputation in June 2001 and is still going strong!

Claw amputation can offer a successful alternative to culling, however preventing lameness in the first place must remain a priority.

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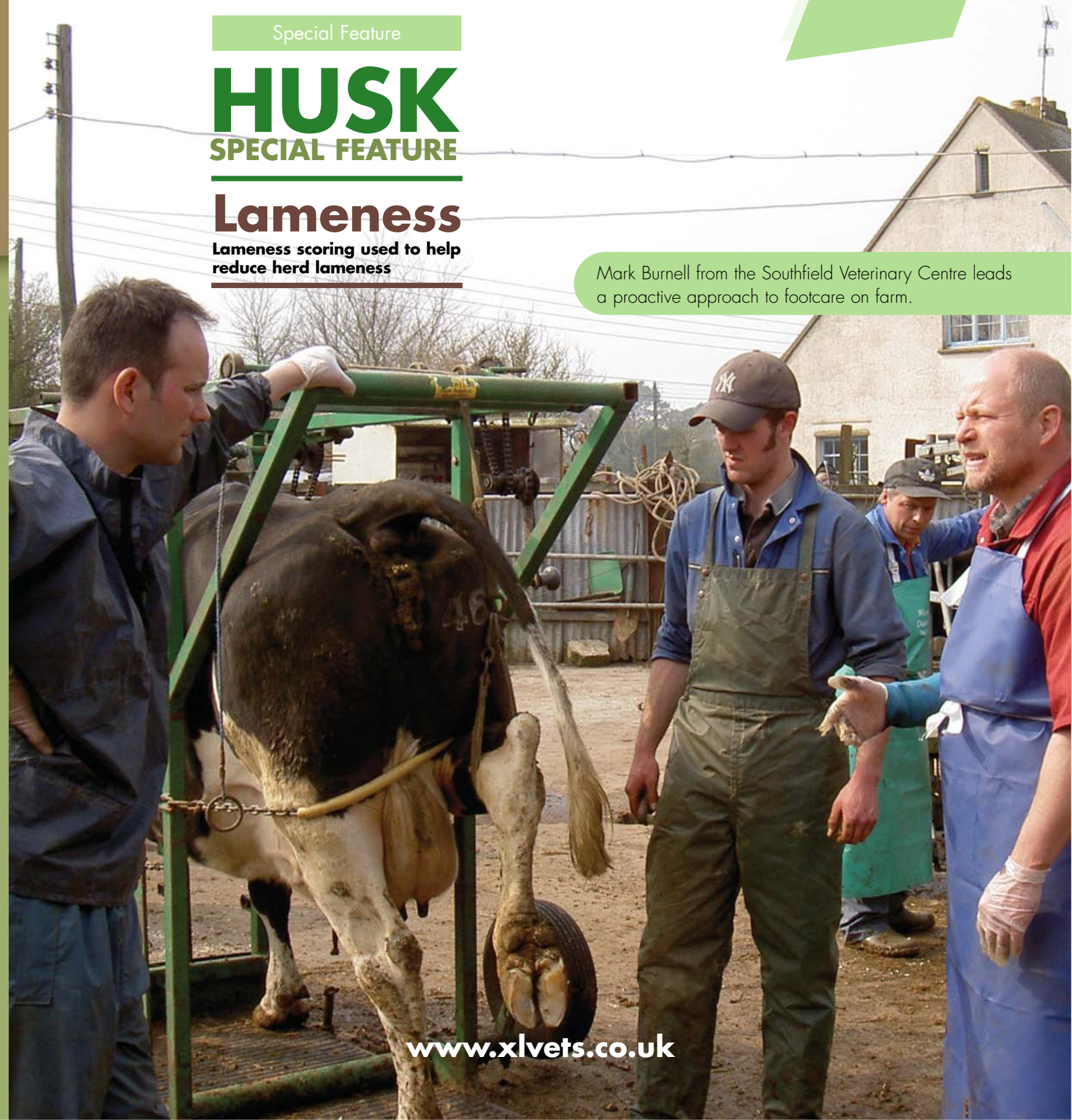
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## Lameness

Lameness scoring used to help reduce herd lameness

Mark Burnell from the Southfield Veterinary Centre leads a proactive approach to footcare on farm.



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Lameness scoring of herds is increasingly being adopted as a management tool to systematically and proactively prioritise cows for treatment and for monitoring the impact of foot care programmes. However, the use of varying scoring systems and behavioural markers of lameness has led to confusion, not least amongst farmers.

## MONITORING LAMENESS ON FARM...

Last autumn a group of dairy industry representatives attended a meeting at Nottingham University hosted by the MDC to discuss the standardisation of lameness scoring in the UK. The meeting was well attended, with representatives from research institutes, universities, the veterinary profession, foot trimmers, breeding companies, advisory bodies, milk retailers and the farming community being present. The outcome was a group consensus on a unified approach and terminology for lameness scoring on farm.



# LAMENESS and Mobility

**Nick Bell**

The University of Bristol, Langford

### **Locomotion, lameness and mobility - terminology for farmers**

Locomotion scoring has been used in research for many years, with Manson and Leaver describing the first scale (Manson and Leaver 1988). The addition of locomotion as a linear trait by Holstein UK was a welcome advance in the late 1990s, but has meant most farmers now recognise locomotion scoring as a breeding tool and not for identifying cows likely to benefit from treatment.

Consequently, the term lameness scoring was adopted to eliminate confusion. Since then there have been repeated calls by farmers for a more positive approach to herd lameness scoring. Benchmarking of herds according to the percentage without obvious signs of lameness has been widely requested, from which the term mobility scoring was born. A key outcome of the meeting in Nottingham was group agreement on terminology: a herd level mobility index based on a cow level

lameness score. There was unanimous support for an MDC national standard for lameness scoring using a 0-3 score.

The descriptors, formulated by subsequent expert consultation, are likely to resemble those in Table 1. These descriptors are still to be agreed and fully tested, but have been formulated using studies on repeatability and predictive value using lesions (Table 1).

This scoring system undoubtedly needs to be supported with training to ensure scorers consistently recognise the signs of uneven weight bearing (dew claws on do not drop to ground evenly on both left and right limbs, the rhythm of limb swing is uneven and/or a head nod is present) and obviously shortened strides (tender footed cows with an arched back).

Recent repeatability data suggests agreement is poorest for score 0 and but near 100% for score 3.

**Below:** Nick Bell is a research fellow based within the Division of Farm Animal Science at The University of Bristol, Langford where he has worked for five and a half years. His work has focused on methods of controlling lameness in dairy cows and herd health planning. He would like to acknowledge the support of his colleagues at Bristol, the MDC and a working group put together by the MDC for the data and the score descriptors in the table.





The Sprecher posture score (promoted by Zinpro), despite its popularity, has not been supported by evidence of repeatability or validity (specificity or sensitivity) and consequently many researchers feel it is too crude for use as a management tool, particularly in first lactation heifers. For farms requiring a greater spread of scores, usually because the numbers of score 2 cows is overwhelming, then half scores can be used to prioritise treatment.

Table 1: Lameness scoring

Score: 0
<b>Good Mobility</b>
<b>Description:</b> Cow walks with a flat back; even weight bearing and rhythm on all four feet. Long, fluid strides possible.
<b>Suggested Action:</b> No action needed but may benefit from routine (preventative) claw trimming.
Score: 1
<b>Imperfect Mobility</b>
<b>Description:</b> Cow steps uneven (rhythm or weight bearing) OR strides shortened; <u>affected limb or limbs not immediately identifiable.</u>
<b>Suggested Action:</b> May benefit from further observation and routine (preventative) claw trimming.
Score: 2
<b>Impaired Mobility</b>
<b>Description:</b> Uneven weight bearing on a limb that is immediately identifiable AND/OR obviously shortened strides (usually with an arch to the centre of the back, that may increase as the cow begins to move).
<b>Suggested Action:</b> Lamé and likely to benefit from treatment.
Score: 3
<b>Severely Impaired Mobility</b>
<b>Description:</b> Unable to walk as fast as a brisk human pace (cannot keep up with the healthy herd) AND signs of score 2.
<b>Suggested Action:</b> Very lame and likely to require immediate attention; nursing and probably further professional advice, possibly even culling.

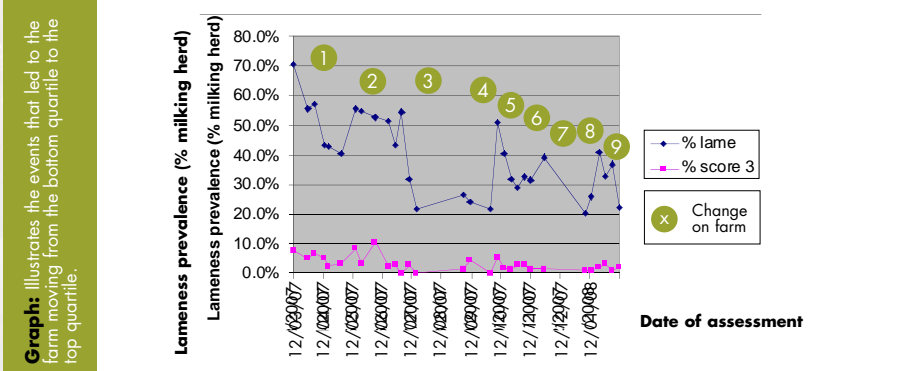
The odds of detecting a lesion

Lameness scoring of herds is fraught with difficulties that make it appear more of an art than a science. Research suggests 90% of lameness is due to pathology within the foot, but early claw horn lesions may not be immediately apparent on foot trimming. Nonetheless, these cows will usually derive benefit from treatment before lesions are grossly visible. Studies that relate foot lesions to lameness score would suggest the odds of finding a lesion increase almost linearly with increasing lameness score. Scoring on clean, level concrete walkway is essential for reliability. Repeated scoring will add confidence to an individual cow's score as does more careful individual examination of the cow's gait.

Screening herds for lameness - principles into practice

Traditionally screening herds for lameness has occurred at herding, during the milking routine and during bulling checks. Generally this fails to detect all except the very lame (score 3) cows or those with grossly visible disorders, and misses the earlier stages of lameness (score 2, and possibly score 1) when lesions are more responsive to treatment and more likely to resolve completely following treatment.

The University Farm at Wyndhurst has had major problems maintaining foot health. In March 2007 lameness was recorded at over 70% at lameness review. The 100 cow herd is autumn calving, has a 7,700L 305 day milk yield and is endemically infected with digital dermatitis. The cows were out by day by the time the assessment was made. The graph below illustrates the events that led to the farm moving from the bottom quartile to the top quartile for score 2&3 lameness prevalence (48.9-79.2%) to the top quartile (0-22.2%) and the key role that lameness monitoring had in driving forward improvement.



Locomotion scoring has been used in research for many years.

Nick Bell - Bristol University

Event on farm

- 1 Antibiotic treatment of herd followed by 5% copper sulphate foot baths once every 2 weeks. Cows turned out by day in early April and out by day and night by late April.
- 2 Score 2 policy formalised. Examination and treatment of as many score 2 cows as possible (30 treated in June). Cows with more than two consecutive scores of 2 were prioritised. The records from these treatments were important in confirming digital dermatitis and sole bruising as the key causes of lameness. Permanent foot bath installed by mid-June.
- 3 Cows waiting in gateway ceased (due to Foot-and-Mouth Disease preventing the A38 being crossed). Kling on blue used in footbath.
- 4 Winter housing and autumn calving. Loss of herds person meant staff shortage and footbathing became sporadic.
- 5 Extra layer of rubber inserted under rubber cubicle mats to improve lying comfort. Mat installed on turn out of parlour exit. Antibiotic footbath used.
- 6 Forceplates installed in footbath for 3 weeks (preventing footbathing).
- 7 Footbathing re-instated. Antibiotic footbath used to regain control of infectious lameness.
- 8 Drains blocked preventing footbathing.
- 9 Footbathing re-instated.

The regular screening of the herd has been extremely useful for monitoring the impact of interventions and confirming that regular footbathing has been the most important feature in controlling lameness. The treatment drive prompted the discovery of more sustainable

preventative measures. It also generated action lists for the early detection and treatment of lameness, the most likely reason for the percentage of score 3 cows being consistently below average from mid-October, and occasionally in the best quartile, having been in the worst quartile in March. Several cows in the herd have been identified as being vulnerable to sole bruising by virtue of thin soles and standing times are being actively managed. In the words of the farm manager, 'finding the time to treat score 2 cows has prevented the score 3s'.

A policy is now in place whereby cows that have been score 2 for a month are examined within a month, as these cows do not appear to recover without intervention. Evidence for optimal detection and intervention regimes is lacking and a case-by-case approach is probably sensible. The score 3 cows are examined within 24 hours if they are new cases and cows that remain score 3 are referred to the vet for a treatment and prognosis.

Opportunities to watch cows walk

Researchers have traditionally scored herds as they exit the parlour at milking. A key barrier to lameness scoring by the farmer is the lack of opportunity to watch the whole herd walk unobstructed in single file apart from at milking and the lack of spare labour capacity on farm. Scoring from the milking pit is ineffective. Approaches that have been successfully adopted on the more progressive farms include:

- 1 Identifying score 2 and 3 cows as they walk in single file on the way to the collecting yard or as cows are moved at other times, such as on return to fields.
- 2 Scoring cows as they loaf or move between lying area and feed barrier. Unless performed systematically, some cows are likely to be overlooked.
- 3 Vet scoring at TB testing or at PD. Only cows in the first half of lactation are observed.
- 4 Asking the foot trimmer to score a group of cows. Foot trimmers are in short supply and they may not be willing to sacrifice time for scoring.

- 5 Milk recorders and linear assessors. Other trained assessors may be available to independently score herds as part of the services they offer.

Many farms that have regular foot trimmer visits have realised the value of monthly screening to identify the milder score 2 cows for attention rather than targeting the severe score 2 cows and score 3 cows as has traditionally occurred. The severe score 2 and 3 cows generally benefit from more than a foot trim and a block i.e. careful and repeated trimming; nursing and possibly referral to a vet.

Standardisation of scoring

Lameness scoring without standardisation is prone to poor repeatability. Lameness score training materials are currently available online ([www.cattle-lameness.org.uk](http://www.cattle-lameness.org.uk)) and through organisations like the Kingshay Trust. Other materials will soon be available through the MDC, who will be publishing their 0-3 National Standard for Mobility scoring. Reaseheath College, in conjunction with Owen Atkinson from Lambert, Leonard and May and Steve Bradbury, have produced an excellent DVD on foot trimming, the latest version of which will contain guidance on identifying the behavioural indicators of lameness.

Benchmarking and following trends

As with any subjective scoring there is scope for inter-observer variation, so if the data is to be used for benchmarking, the same person should score over time whenever possible. Benchmark standards vary according to which score is used. Data from the Healthy Feet Project would suggest there are large variations in lameness prevalence between and within farms, but as a guide, the following figures have been derived from a representative sample 227 farms (Table 2).

Table 2: Lameness score benchmark data from 227 farms

	Acceptable Mobility Score 0 + 1 - not lame	Impaired Mobility Score 2 - lame	Severely Impaired Mobility Score 3 - very lame
Worst UK Farm	20.8%	58.2%	31.2%
Worst 25% UK Farms	51.1%	40.6%	7.8%
Median	64.0%	31.0%	3.3%
Best 25% UK Farms	77.8%	20.7%	1.00%
Best UK Farm	100.0%	0.0%	0.0%

As with any benchmarking exercise, results need to be handled sensitively. Studies have demonstrated that many farmers are unaware of the mild signs of lameness and mobility indices will often come as an unpleasant surprise to many farmers who have not realised the proportion of the herd exhibiting signs of score 2 lameness.

To discuss any aspect of this article and to ensure the health of your cows' feet, talk to your XL vet today.





## Getting it right is a journey and not a destination...

Mark Burnell from Southfield Veterinary Centre, Dorchester presents a farm case study

The farm is an 8,500 litre, 200 cow TMR fed cubicle-housed unit, with aspirations to reach 9,500 - 10,000 litres. Lameness was identified as a major problem with several heifers requiring culling in early lactation and many older cows with poor locomotion.

A preliminary farm visit confirmed the presence of a large number of lame cows, both with foot and hock problems. A locomotion(mobility) score was carried out for all the cows and the most seriously lame cows attended to as soon as possible. The records of these and previously examined lame cows were analysed using Interherd which revealed that 81% of the cows had horn related problems (sole ulcer, white line abscess and bruising) and 18% had slurry related problems (digital dermatitis, foul in the foot).

The next stage was to carry out a full lameness risk assessment for the farm; this involved looking at all aspects of housing and management including heifer rearing and dry cows. Cow tracks and gateways were left for the time being, the intention being to review these after turnout as they were not considered to be such a major problem. The most significant findings were:

- Cubicles too densely stocked
- Mattresses were old, some were damaged and the surface was very abrasive
- Cubicle head rail was too low
- Slurry was allowed to build up in parts of the cubicle house (where the tractor scraper could not access)
- Automatic scrapers were producing a large wave of slurry which washed over the cows feet and created a pile in front of the slurry store that cows could walk through
- Heifers were reared on straw and had no exposure to concrete or cubicles before calving
- There were too many overgrown claws
- Footbaths were too short
- There was evidence of poor rumen function (SARA)

An action plan was drawn up with short and longer term aims:

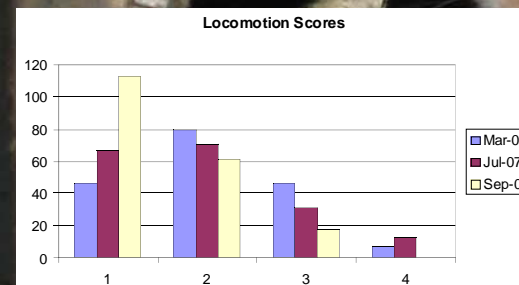
- 1 The cubicle head rail was raised to the recommended 1.2m above the bed.

Above: Cow with a sole ulcer

- 2 Automatic scrapers were set to maximum frequency and the blades changed.
- 3 More effort was put into chopping the straw already being included in the diet and regular checks were made on the diet using a Penn State separator. Some water was added to try to reduce 'sorting'.
- 4 At the heifer unit a feed passage was created in the straw yards and scraped daily so that they had some exposure to concrete.
- 5 A regular foot trimming regime was initiated using the practice foot trimmer, including regular locomotion (mobility) scoring and detailed recording.
- 6 Efforts to be made to improve slurry clearance around the buildings and by the lagoon.
- 7 The worst mattresses were replaced as soon as possible with Kryberg mats, and the quantity of shavings used increased and put on daily.
- 8 Increased frequency of footbathing using copper sulphate but also antibiotic as required and ensuring all cows and heifers are footbathed before entering the milking herd.
- 9 A 'fresh cow' group is planned using gates that can be attached to the cubicles so that the size can vary depending on the number of cows calving. The advice is to ensure that this area is always has one or two spare cubicles to keep it as stress free especially for the heifers.
- 10 Farm staff to be trained so that prompt attention to lame cows is carried out on a daily basis.
- 11 Long term the plan is to investigate the possibility of exposing heifers to cubicles during the rearing period.

To date there has been a big reduction in the hock problems and foot lameness is improving as measured by the locomotion scoring with an approximate increase of 50% of cows classed as score 1 (not lame) - work continues.

# Lameness



Southfield Veterinary Centre  
Dorchester, Dorset



It is no coincidence that housing cattle for the winter results in increased levels of lameness within the herd. This is partly because sheds and cubicles are often not designed with cow comfort in mind and older housing may not be suitable for the Holstein/Friesian breed. Common signs of poor cubicle design include swollen knee and hock joints, hock lesions and wounds on the hip bones.

Just have a look around your herd. How many animals are lying properly in the cubicles? Can each animal stand with all four feet in a cubicle comfortably? Cows standing with their back feet in the passageway are at a greatly increased risk of lameness due to increased weight load on and standing in slurry. An average Holstein/Friesian cow requires a cubicle length of 10 feet - many older cubicles are much smaller than this.

Modifications do not need to be expensive; for example simply removing a solid neck rail and replacing with a flexible strap can effectively increase the length of the cubicle.

When considering cubicle design, it is useful to watch a cow at pasture to see how she stands up - she needs plenty of room in front to lunge forwards and also room for her front foot to be stretched out in front of her. Cubicles with a solid wall in front prevent a cow from standing up easily and so can lead to injury. To prevent problems in first lactation animals, heifers should be cubicle trained from yearling

age, use the most comfortable cubicles that you have available e.g. with mats and plenty of straw bedding to encourage them to lie correctly. Tyres can be used in adult cubicles to make them a more appropriate size.

#### Digital dermatitis (DD)

This is one of the most common causes of lameness in housed cattle. Slurry is the biggest risk factor for DD so keeping cows' feet out of slurry is a priority. Many dairy herds routinely foot bath throughout the housing period and, done correctly, this can be an effective way of treating and controlling DD.

#### Antibiotic foot baths

These (including Lincospectin, Tylan and Erythrocine) can be used as a treatment if more than 10% of the herd are affected although many of these products are unlicensed for this use. Once the DD is under control, a disinfectant foot bath can be used; many products are available and usually contain copper sulphate, zinc sulphate or formalin.

There are advantages and disadvantages to each one, speak to your vet to find out which is most suitable for your farm.

To be truly effective, the feet must first be clean of all muck, this can be achieved by either hosing the feet off individually or passing them through a water bath prior to the main foot bath.

#### Locomotion scoring

This should be carried out on a regular basis to assess the prevalence of lameness in the herd. This is a specification of most herd health plans and some milk buyers have caught on to this and are insisting that this is done as part of their contract. Locomotion scoring is a simple visual assessment (0-3) looking at the whole cow as well as individual leg (see box).

Your XL vet can carry out an initial annual assessment and can then provide training to enable you to carry it out for the rest of the year.

ROSE JACKSON OF THE SCARSDALE VETERINARY HOSPITAL EXAMINES THE CAUSES OF LAMENESS WHILST HOUSING CATTLE FOR WINTER

Have a look around your herd. How many animals are lying properly in the cubicles? Can each animal stand with all four feet in a cubicle comfortably?

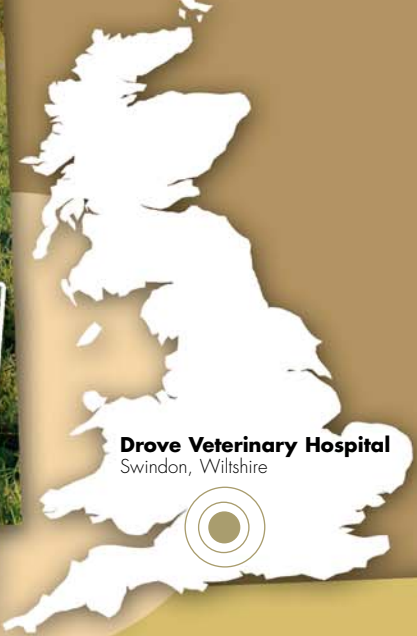
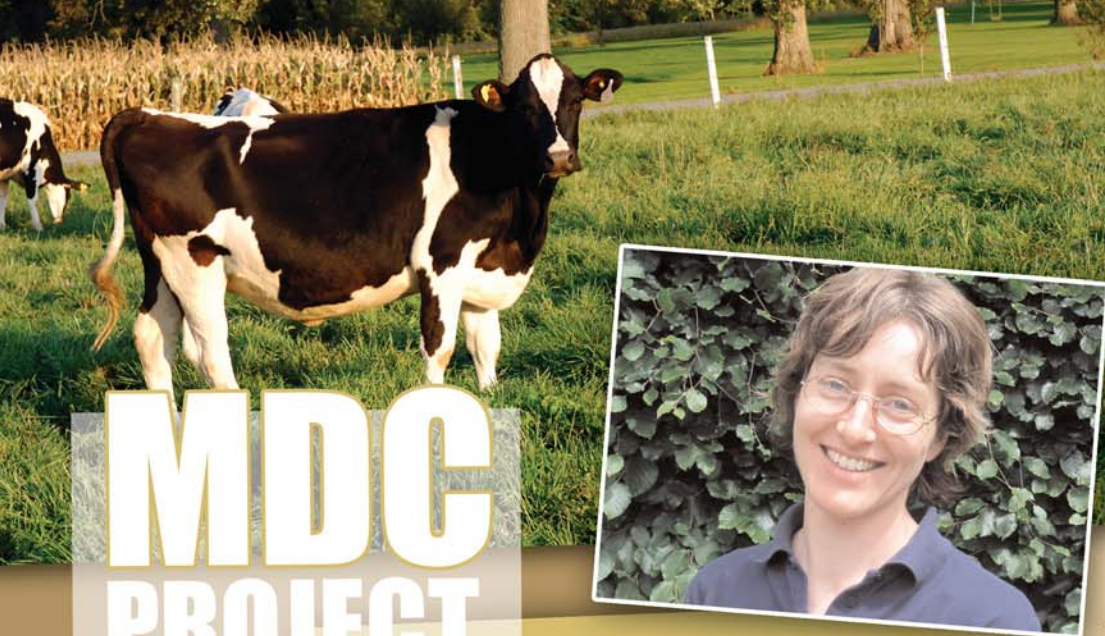
# LAMENESS IN UK DAIRY CATTLE

*by Rose Jackson*



Scarsdale Veterinary Group  
Derby, Derbyshire





## Recommended Changes

## Farm A

This herd of 170 organic Holstein Friesians had a lameness prevalence of 28.7% which corresponded quite well with an annual incidence of 84.7%. Both are well over the target of 15% and 39% respectively. Most foot lesions were diagnosed as white line disease and sole ulcers (total of 79%) with some digital dermatitis being present (8%) and quite a few visible hock lesions. The total cost of lameness was £33,000 per year (£19,400/100cows/year). The infrequency of foot trimming caused overgrown feet with weakening of the white line and pinching of the typical sole ulcer spot. Also long walking distances in the summer and rough cattle tracks were increasing the risk of white line disease. Advice was given to routinely trim all cows' feet at least once a year, ideally in late lactation and to review cattle track design.

The cubicle design left room for several improvements. There are times when there were as many cows as cubicles available. The basic measurements are fine, but do vary a lot. The bedding consists of straw on concrete, which results in several cows with hock lesions. All this increased standing times and therefore put more pressure on feet. Advice was given to reduce stocking density and to provide mats or mattresses to increase comfort and lying times. Also adjustments to cubicle divisions and head rails should be made and broken concrete in the yard needs to be repaired.

Milking was done in 3 groups, which meant standing times were short. Feeding an organic diet based on grass silage meant ruminal acidosis was unlikely to be a contributing factor in the number of sole ulcers.

Cows are adequately clean, but regular foot bathing needs to stay in place, certainly before risk periods, to keep digital dermatitis under control.

## Farm B

This herd of 181 milking cows had the highest locomotion score of 40.5%. The incidence was of 63.5% is a lot lower than the expected 2.6 times prevalence. This means the herdsmen consider a cow to be lame less easily than the locomotion scoring vet and not as many feet are picked up, treated and recorded as necessary. More care needs to be taken in the future to identify lame cows, treat them as soon as possible and record them properly. The main diagnosis was sole ulcers with white line disease coming second. The cubicles were all shorter than the ideal 2.4 metres with too high a kerb. This made cows stand half in the cubicles and they had problems reversing out. This results in increased pressure on tendons and sole horn creating more sole ulcers. In the long term a new cubicle shed might be built. In the short term moving the head ropes forward and adding a fillet at the front will increase cubicle comfort greatly.

Standing times before milking are quite short. The entry to the parlour is round an awkward bend though, where bruising of horn can occur. In any future building works this should be addressed.

The cow tracks are topped with hardcore which will contribute to white line disease. Changing the topping to 'cundy' peelings will increase cow comfort.

## Farm C

This herd of 160 cows had a second lowest prevalence (21%) and incidence (26%). The actual incidence is probably a lot higher due to insufficient data being available for recording. White line disease (44%) and digital dermatitis (28%) were the most diagnosed causes for lameness. The incidence of only 8% sole ulcers reflects the straw accommodation that is currently used. This year a new cubicle shed is built which will have cubicles that are long and wide enough. Straw yards are normally more comfortable for cows, so hopefully the new cubicle shed will be designed well and not increase levels of lameness.

Digital dermatitis mainly occurred in the winter despite the fact that cow cleanliness is generally good. Foot bathing routine has lapsed and needs to be reinstated. Cows do not walk far in the summer, but loose stones on concrete roads are contributing to white line disease. Adding cundy peelings will improve cow comfort and reduce lesions. Standing times for milking are short as cows are milked in two groups. There is a low incidence of ruminal acidosis, ketosis and LDA's, but cows are fed in one group allowing late lactation cows to gain too much condition. This can lead to problems around calving and lameness around 4-6 weeks post calving.

Feet should be trimmed at least once a year, ideally before drying off and any lesions found need to be recorded properly. Biotin can be added to the diet to improve horn quality.

## Farm D

This herd of 220 cows had the lowest locomotion score (12.8%) of the five farms. This corresponded with the lowest incidence of lameness (28.6%) which was well under the target of 39%. There was a remarkable absence from digital dermatitis in this herd, which will have to be protected by biosecurity measures in the future. The main diagnoses of lameness were white line disease and sole ulcers. Factors involved in this were a history of ruminal acidosis, standing times and cow track design. It was advised to improve cubicle comfort by adding brisket fillets, replacing the sand and lowering kerb height. Further advice to reduce standing times included milking in different groups and making a separate heifer group. All this should reduce the impact of standing on concrete on sole bruising and haemorrhages and therefore reduce incidence of sole ulcers. Improving the comfort of the cow tracks by providing cundy peelings and adding long fibre to the TMR diet will help to reduce the incidence of white line disease.

## Farm E

This herd of 250 cows has had a lameness problem for years. The lameness prevalence measured by locomotion scoring was the same in December 2004 as in December 2006 (34%). The incidence of 110% is also well over the target of 39%, but at least care is taken that cases are looked at and treated regularly. By far the main diagnosis were sole ulcers (42%) with digital dermatitis coming second, although the latter might be under recorded because of very frequent foot bathing procedures. The new light and airy cubicle shed for the milking cows works well as the cows are comfortable and clean. Cubicle dimensions are fine apart from a slightly high kerb.

Standing times on concrete are quite long and could be reduced by milking in groups and making a separate heifer group.

**£1000 FOR 1000 COWS** The performance of locomotion scoring and investigation of lameness records to identify causes and advise on improvements to reduce incidence of lameness on farm. Janet Blickmans from Drove Veterinary Hospital reports on the project.

## Outline of project:

- The project started with a group meeting where we presented the principle of locomotion scoring, explained the 'Dutch method' of foot trimming and discussed the main causes of lameness and their treatments. We handed out a printout of the presentation slides for future reference. We also explained the aim of the MDC project and the time frame involved.
- We then followed this up with individual farm visits where one of the vets involved carried out locomotion scoring of the milking herd. We also collected lameness data from the farmers' records and inspected other management aspects like cubicle dimensions, standing times and walkways.
- We invited a guest speaker, Keith Cutler of Endell Veterinary Hospital, to attend an on-farm session for all involved farms. We put the 'Dutch method' of foot trimming in practice by inviting everybody to trim some cows' feet under the expert eye of Keith. Questions arising from this and general lameness aspects were discussed.
- Results of the locomotion scoring were collated and put in individual reports detailing our findings and recommendations.
- In our final meeting we presented the locomotion scoring figures and benchmarked the farms blindly against each other. The reports were presented at this meeting and a presentation was given on cow comfort.

## Results:

- None of the farms in the group (identified here as farms A-E) used locomotion scoring as a tool to identify lameness, although farm E had it performed by a vet once in December 2004.

- All 5 herds were Holstein Friesians, only farm A was organic.
- The size of the herds ranged from 160 - 250 dairy cows.
- The average production level of the farms was 8359 litres per cow per year, ranging between 6,300 (farm A) and 9,000 (farm B) litres per cow per year.
- Four of the farms house their milking cows in cubicles and farm C will change shortly from straw yards to cubicles.
- Locomotion scoring was carried out by three different vets. Farm A by vet 1, farm B and C by vet 2 and farm D and E by vet 3. This was done to distribute the workload, although a better comparison would have been possible with one vet carrying out all the locomotion scoring.
- Locomotion scoring was carried out on a 1-5 scale on all the milking cows and therefore gives a good (but not complete) picture of the prevalence of lameness.
- The lameness prevalence, measured as a percentage of cows with a score of 3-5, varied greatly between the five farms:  
farm A - 28.7%, farm B - 40.5%, farm C - 21%, farm D - 12.8%, farm E - 33.7%.
- The lameness incidence, taken from the records available on the farm were as follows:  
farm A - 84.7%, farm B - 63.5%, farm C - 26%, farm D - 28.6%, farm E - 110%.
- The estimated cost of lameness per 100 cows per year varied from £4419 to £28601.
- The comparison shows some discrepancy between prevalence and incidence which can be due to lack of recording, over-recording or calving pattern and seasonal influence.
- The most diagnosed cause for lameness cases was white line disease. The next most common cause diagnosed was sole ulcers except on farm C which interestingly is the only farm with straw yards.
- Digital dermatitis was present on all farms except farm D. Farm C had the highest incidence and this was linked to a lapse in foot bathing regime.
- All farms had recommendations to improve cow tracks to reduce the incidence of white line disease.
- Incidence of white line and sole ulcers were related to standing times in the collecting yard on farms D and E.
- Inadequate cubicle dimensions on farms A and B. Farm A has widely varying cubicle width and farm B's cubicles are too small altogether.
- Cubicle bedding varied. Concrete and straw on farm A led to a high incidence of hock lesions. Mats or mattresses were recommended.
- Sand cubicles are recommended as the ideal. As only farm D used sand in some cubicles this recommendation was difficult to assess.
- All farms except farm D used a foot bath with varying regularity. The non existence of digital dermatitis on farm D was a surprise. Every effort should be made to ensure this absence persists.
- Foot bathing appears to control dermatitis which was highlighted on farm C where it had lapsed and dermatitis incidence was highest of all farms.
- Only two of the farms include biotin in the ration. This is known to improve horn quality and can help reduce the incidence of sole ulcers and white line disease.



# PREPARING for Turnout...

With turnout around the corner, it is worth taking a few moments to consider the options for protecting cattle against lungworm.

With turnout around the corner, it is worth taking a few moments to consider the options for protecting cattle against lungworm. Where there is a known problem, a belt and braces approach includes the use of a vaccine (Bovilis® Huskvac) before turnout.

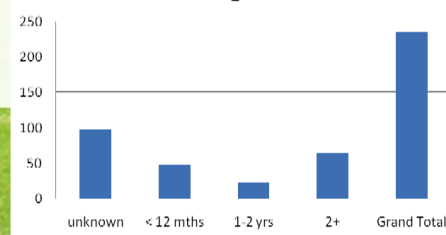
It is easy to assume, and it has traditionally been accepted, that husk is a problem of younger cattle. However, over the past few years there have been an increasing number of reports of the disease affecting adult cattle. In 2007, VIDA figures show more cases of the disease in animals over two years of age than in any other age group. The change in the age profile of the disease means a change in the effect on the economics of the disease.

While in youngstock the main effect remains a reduction in growth rates, leading to longer finishing times or time to first service, in older cattle the disease can depress milk yields and reduce fertility.

For a 100-cow dairy herd yielding an average 7,000 litres, the cost of an outbreak could be as high as £15,000 in one year alone. What is more, this is only the result of two deaths, three culled animals and three abortions. What it doesn't take into consideration is any extra vet visits, current replacement costs, diagnostic testing and the loss of milk during treatment, so the eventual cost of an outbreak could be much more. The cost of vaccinating is negligible in comparison.

You'll need to plan ahead, since vaccination requires two doses of the vaccine to be given with an interval of four weeks between doses and a minimum of two weeks between the second dose and turnout. The vaccine can be safely administered to pregnant or lactating heifers, and can also be used as a preventive measure against lungworm outbreaks in adult cattle. All farms should have a parasite prevention plan in place. If you haven't or if you've had any outbreaks in the past or have introduced bought-in stock please discuss the best approach to minimising the risk of an outbreak this spring with your XL vet.

Number of diagnoses in cattle



## CASE STUDY

### Crewkerne Somerset

A policy of blood testing to monitor lungworm then treating in alternate years with anthelmintics had to stop when the AH Warren Trust's Greencombe Farm went into organic conversion.

Vaccination with Bovilis® Huskvac is now a key part of the herd's health plan and a good example of how a treatment strategy has been replaced by preventive management, says farm manager Andy King. 'We used to get away with spot treatment. But the downside on any farm is that when you've got a problem, it's really too late. In our case, a percentage of animals were exposed and really challenged by lungworm. So a policy of 'let's see what happens' is a risky one,' he says.

The farm's 250-cow herd near Crewkerne produces 7100litres/cow and is one of seven sites owned by the Trust. It finished conversion in 2005 and with core values that people, cows and the environment are essential to the business, meant that the focus is on the highest standards of stockmanship, together with fortnightly vet visits. 'We see our vet as an investment not a cost. We could have potentially cheaper vet bills, but this would create a welfare issue on farm. We try to prevent disease - not just treat the symptoms.

'Yet because of a rising incidence of lungworm infection due to our milder, wetter weather, the traditional organic protocol of gradual infection to generate natural immunity isn't possible, hence the introduction of a vaccination programme using Huskvac.'

Andy believes both conventional and organic units would benefit from assessing their risks and challenges from lungworm. 'We asked our vet, Jereme Darke of the Kingfisher Vet Practice, what would suit us to control lungworm and vaccination is little to pay compared with the potential losses.'

However, he adds that it's important to have a full control strategy that includes grazing management and takes into account the age spread of heifers in a year round calving herd. 'We aim to balance a bit of lungworm challenge with stocking density. We have one block of unimproved land bordering the river which we don't graze as it's potentially a big lungworm problem area.

'Vaccination should be carried out correctly to fully benefit stock, but it's not the easiest job when there is a range in size of young animals going out. If you are trying to dose

a 500kg beast, have you really got it all down their throat? You also have to bear in mind that Huskvac is a hard to handle vaccine that is also time sensitive. You need to be organised.'

Farms which have let vaccination lapse are those experiencing the most serious outbreaks of lungworm, as are those who never vaccinate, or where parasite control is poorly managed, according to vet Jereme Darke. 'Farmers stop vaccinating because they perceive they don't have a problem any more and partly because of cost cutting,' he says.

Yet weighing up treatment with prevention on medicine costs alone, Jereme says vaccination at around £7/head is a one-off, whereas treating adults costs at least £5 a shot and must be done more than once a year. 'Then consider the effect disease has on stock: from cows which die, to sick cows losing milk yield, and subclinical cases which show no clinical signs yet growth is stunted or milk yield reduced. Compared to current milk prices and replacement costs, £7 is peanuts.'

The most significant factor in a lungworm problem is its unpredictability, he warns. Large numbers of infective larvae rapidly build up and warmer, wetter autumns and winters mean they are active on grass for longer. This means that programmes which control gut worms are not always effective against lungworm, so vaccination is the best policy.

'Lungworm has to be controlled, otherwise it's like waiting for a bomb to go off. It is more of a seasonal problem, but never rely on a farm's history. Years such as 2007 where the autumn was dry and stock stayed out until November meant that if cattle were wormed in September or October, they could have become re-infected before housing - you certainly couldn't guarantee they were lungworm free.'

And Huskvac isn't just for using on youngstock. Bought-in adults are another risk as they have an unknown status when it comes to lungworm infection and vaccination, adds Mr Darke. 'They could contaminate pasture, though it's more likely



Above: Andy King - Farm Manager



Above: Jereme Drake - Veterinary Surgeon



they are at greater risk than their new herdmates so you need to take steps to protect them. Ideally, worm then vaccinate with Huskvac.'





## Callington Cornwall

Too much treatment and not enough prevention in youngstock is leading to reduced immunity and more cases of lungworm in adult dairy cows. Continuous worming programmes fail to give stock the immunity they need, says Stuart Gough of Calweton Vets in Cornwall, who diagnosed lungworm in several dairy herds last autumn.

'There was no major yield drop, but cows definitely were not achieving their potential which creates a significant effect over the whole lactation. What is more, losses are rarely recouped,' he says, adding that all cows in these herds had to receive veterinary treatment for their condition.

Vaccinating youngstock with Bovilis® Huskvac, then boosting immunity by allowing them to graze contaminated pasture is the only way to ensure that adults are not affected by lungworm, he points out. However, a struggling dairy industry making cutbacks has seen many producers trying to do without Huskvac. This trend has been compounded by an increase in the use of anthelmintics leading to a reliance on worming to treat lungworm. As a result, Stuart suspects many herds are now over-worming.

'Many farmers prefer to monitor and treat according to the results, yet still think they are doing a good job. Instead, they should use their vets to help come up with a lungworm control programme based on risk assessment and management practices for their farm.'

Modern management from extending the grazing season, to milking very high yielding cows, affects lungworm incidence as well. Longer grazing periods may benefit from a trickle effect of lungworm exposure and protection - but only if they vaccinate first. Stuart also believes that high yielding cows can't deal as effectively with a large lungworm challenge, because metabolic stress affects their immune system.

He warns those herds which operate a zero grazing policy (only turning dry cows out to grass) that they could be making their cows susceptible through non-exposure. What is gained in diet and management consistency during lactation, is soon put at risk when mild, wet weather creates a sudden boom in larvae populations at pasture. Such lungworm explosion is very harmful to stock with little, or no, immunity. 'We tend to see symptoms in late summer and autumn which

means cows need exposure at grass from mid summer to help maintain their immunity.'

One client with firsthand experience of what happens when cows without immunity are turned out to grass, is Roger Goodman of Ashgrove Farm near Launceston. He moved farms three years ago, joining his own herd of 70 cows to 120 that were housed all year round and milked through two robots. Alarm bells started to ring when an eight-year old cow, which had produced 18,000 litres in her last lactation, died suddenly.

'Cows giving over 30 litres/day were milked by robot. Once they got back in-calf and dropped below 30 litres, they were moved to a different shed and put through the parlour,' he explains. Roger soon turned low yielders out to grass and quickly decided that he didn't like automated milking at all. The high yielders, therefore, followed suit and he sold the robots. 'The cows all ran together and this high yielding cow dried herself off. We put her with the dry cows, but when she calved she wasn't right at all. I called Stuart and the cow died while he was examining her'.

'A post mortem showed one of the worst cases of lungworm they had ever seen. It was put down to the fact she had been inside for a good two years and had lost her immunity, so when she went out the sudden build up of infection was too much'.

All cows were immediately wormed, and as someone who had routinely vaccinated his youngstock using Huskvac, Roger continued the practice. 'We used to use a slow-sustained release product for heifers as well, until one year the group calved and were not right. I lost two heifers and a couple started coughing. Stuart said it was probably lungworm because the slow continuous-release wormer gave them no chance to boost their immunity.

'We now use a pulse-release bolus instead, supported by a vaccination strategy,' he says.

'I've used Huskvac for at least 15 years - it's too expensive not to, when you do all that work to calve heifers at two years.

'We are in a wet area (about 65" of rainfall) but I've had no problem with lungworm since using Huskvac. It's like insurance: you never know it works until you stop, but that's too big a risk to take.'



Calweton Veterinary Centre  
Callington, Cornwall



Above: Roger Goodman - Ashgrove Farm

## Northwich Cheshire

Rearing replacement heifers can be costly, but investment in good parasitic control pays a dividend in more ways than one for Cheshire-based cheese-maker Joseph Heler.

The Helton herd of 280 pedigree Holsteins, not only supplies milk for processing, but has established a reputation through local pedigree auctions as a provider of high genetic merit replacement heifers.

Herd manager Mark Thornton knows that the success of a dairy cow is often rooted in investing in a strong, healthy calf. The first grazing season can often be critical. 'With our vet we have developed a thorough parasite control programme for gutworms and importantly lungworm. Having seen the consequences of husk outbreaks, we ensure young stock are always vaccinated before turnout,' he explains.

Husk can emerge as a mass infestation of lungworms. Having established themselves on pasture, the lungworm larvae complete their life cycle in the calf's lung and upper airways. This has a severe impact on the host animal's breathing.

Typical signs include a husky cough or laboured breathing due to a build up of parasites and fluid in the respiratory system. 'Death or incapacity may result, but at the very least, growth rates can be very poor. The situation almost invariably worsens and lost growth and vigour can rarely be recovered.

The effects continue into adulthood. It is widely acknowledged among researchers, advisers, vets and farmers that milk yield in mature animals can be cut by an average 10%. On top of that, there are additional feed, medicine and labour costs.

'We know that to do well heifers have to hold their own; the commercial buyer is looking for something with a bit of power. With rearing costs of £850/head there is no room for unnecessary expense but investment in the parasitic control programme is a good investment', adds Mr Thornton.

At Joseph Heler's, The Parkes, near Audlem, Cheshire, all calves are vaccinated with Bovilis® Huskvac oral lungworm vaccine prior to turnout. Two doses are administered six weeks apart and at least two weeks before turnout. 'Our programme is reviewed on an on-going yearly basis with our vet Mark Proctor of Willows Veterinary Group,

Northwich, and meets the needs of farm assurance', adds Mr Thornton.

Despite being on the market for nearly 30 years Huskvac, or Dictol as it was formerly known, still represents one of the best investments a stock-keeper can make in disease prevention, suggests Mr Proctor. 'It is a unique product and concept that has stood the test of time. Some worming regimes involve frequent dosing or use of long acting anthelmintics but none can offer the level of protection against husk afforded by Huskvac.

'A few years ago, when season-long continuous treatment with ivermectin wormers was in fashion, many clients suffered outbreaks of husk in young adult milking cattle. The consequences were severe and we concluded that their immunity to lungworm was poor, possibly due to the highly effective wormer regimes.

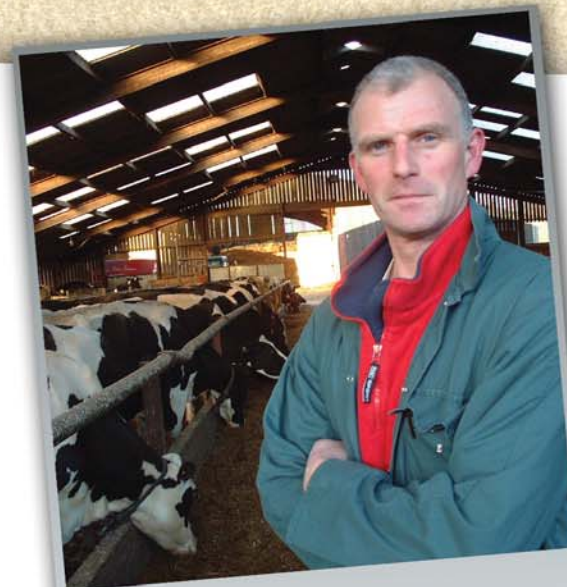
'The situation was rectified in our practice when many clients reverted to the Huskvac system that they had previously abandoned. 'We will continue to recommend Huskvac as an integral and highly cost effective vaccine for dairy heifer rearing. It can be used side-by-side with a sensible gut worm control regime - something your vet can advise on, as part of every farm's Herd Health Plan'.

Healthy calves lead to healthy heifers, suggests Mr Thornton. 'We have a herd average of approaching 8800 litres at 4.1% butterfat and 3.35% protein. Heifers sold through the Western Holstein Breeders Club sales at Beeston Castle market have recently averaged 1750gns apiece.'

'Our system works well. As they say if it works don't try and fix it !'

**With our vet we have developed a thorough parasite control programme for gutworms and importantly lungworm.**

Mark Thornton - Herd Manager



Above: Mark Thornton - Herd Manager



Willows Veterinary Group  
Northwich, Cheshire





### Timing made easy

A pro-active Huskvac ordering service, run by Shepton Veterinary Group's office manager Cathy Snook, has benefited the vet practice as well as its farmer clients and their dairy youngstock. When the lungworm vaccine stopped being delivered direct to farms, Cathy collected orders from farmers, so that the practice could place and take delivery of one big bulk order, a process that was time-consuming with scope for administrative errors too.

Huskvac's relatively short shelf-life and production run, dictate the timetable. This starts as early as January with a reminder in the practice newsletter about lungworm. 'Farmers want to ensure they receive stocks in plenty of time before youngstock are turned out to grass. They need to allow four weeks between the two doses, then an additional two weeks before turning out,' Cathy explains.

Having one point of contact for farmers plus a friendly voice on the end of the phone has proven a good incentive and Cathy believes the practice's clients value the service provided.

'When we order the first dose, we automatically order the second lot for use in four weeks' time. Most farmers order mid February and I would say 70% of orders peak in February and March as the majority of farms here turn out stock at the beginning of April.'

Farmers have to phone by Monday lunchtime, so that Cathy can place a bulk order with the veterinary wholesaler which is delivered 24 hours later. 'Then it's all hands to the deck. We sort and label individual orders, storing them in our fridges until collection. Then I contact all of the farmers to let them know it's ready to collect - some need a bit of a reminder.'

Les Davies is one dairy farmer who finds the ordering service a real help: he knows only too well what happens when Huskvac isn't ordered in time. Mr Davies, together with son Colin and grandson Thomas, runs a 100-cow organic herd at Butleigh Road Farm, Glastonbury, Somerset. Production averages 6000 litres.

About nine years ago, Les remembers losing three steers to lungworm and 10 replacement

Friesian heifers failed to perform well. For some reason, he says he was too late in ordering his lungworm vaccine. 'I've always vaccinated for lungworm, ever since I started farming. But something happened that year and we'd left it too late, so we didn't bother and decided to chance it when we turned out,' he explains.

In September, three eight-month-old Hereford cross steers died suddenly and were found to be full of lungworm. 'Our Friesian replacements didn't put on weight and were coughing, although they did eventually calve into the herd. There were no problems in the adult cows.'

Farming on the wet Somerset levels, both lungworm and fluke are an issue. As an organic herd, Les needs a derogation for using Huskvac and fluke control and blanket treatment is not allowed.

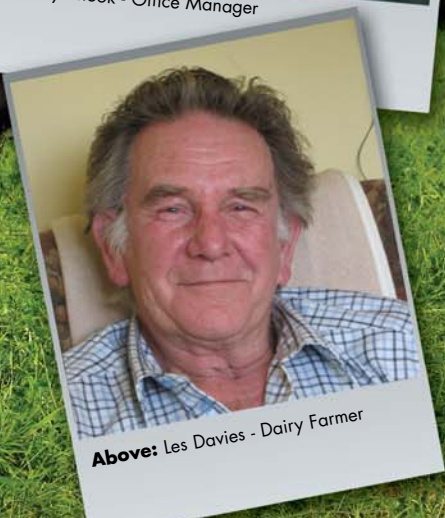
'We now order our Huskvac in February - Cathy reminds us - and stock is vaccinated in March and April ready for turnout at the end of April and beginning of May. The youngest going out is 5-6 months old and, to be honest, the cost of prevention doesn't come into it.'

### Farmers want to ensure they receive stocks in plenty of time before livestock are turned out to grass.

Cathy Snook - Shepton Veterinary Group



Above: Cathy Snook - Office Manager



Above: Les Davies - Dairy Farmer



Images by Intervet

## Taking a milk sample for culture

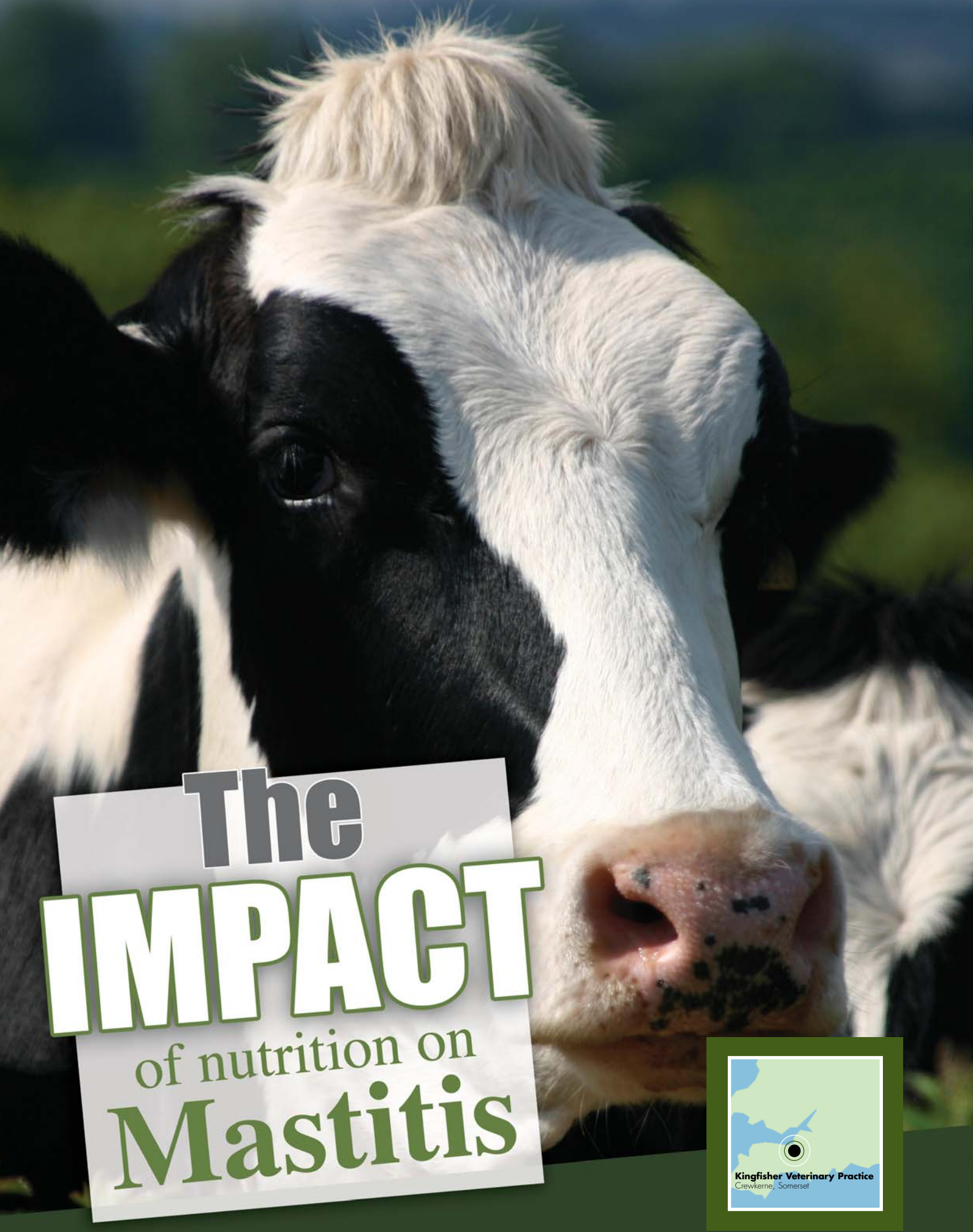
The following procedure should give good results...

Milk sampling for bacterial testing is an important part of dairy farming but don't waste your time by taking a poor sample. The quality of the results (and hence value for money) obtained from submitting a milk sample for bacteriology is very much determined by the quality of the initial sample. The following procedure should give good results.

- Ensure the operator has clean hands. Wash and dry if necessary, or wear clean gloves.
- Wash and thoroughly dry the teat if it appears dirty.
- Strip and discard the first 4-6 squirts, thus flushing out non-mastitic bacteria from the teat canal.
- Thoroughly rub the teat end with a swab soaked in surgical spirit (cotton wool soaked in surgical spirit is OK).
- Take the top off the sterile container keeping any contamination from entering the pot or getting on the lid.
- Hold the bottle at an angle of 45 degrees or less and draw out one squirt of milk in a diagonal direction. If the bottle is held vertically, there is a much greater risk of dust and debris falling into the sample during stripping. One good 'draw' is sufficient. It is not necessary to fill the bottle.
- Replace the cap and label the bottle with cow identity, quarter, date and farm name.
- Store the sample in the fridge (+4 degrees C) until it can be brought into the Practice. Storage for up to 72 hours at 4 degrees C is acceptable, although best results are obtained if the sample is taken to the laboratory immediately. Freezing reduces bacterial numbers (especially for coliforms) but is a useful alternative. Frozen samples can be stored up to 1 month.







# The IMPACT of nutrition on Mastitis



How does the nutrition of the cow impact on the health of the udder? This article is a summary of a paper presented at the British Mastitis Conference 2007, by Alistair Hayton of Kingfisher Veterinary Practice in Crewkerne, Somerset, a member of XLVets.

Fundamentally, the incidence and severity of mastitis cases will depend on the balance between disease challenge and the cow's immunity. The two main focuses of research on the effect of nutrition on udder health have been the effect of energy status and the influence of certain micronutrients.

### ENERGY STATUS

In the week before and week after calving, a cow's normal immune function is suppressed due to hormonal changes. While some level of immunosuppression is normal, if deficiencies in energy and micro-nutrients exist, this may exacerbate the problem leading to increased disease susceptibility.

At the start of lactation, the combination of a lower dry matter intake and a huge increase in the demand for energy create a negative energy balance (NEB) in modern high yielding dairy cows.

This 'energy gap' can in some animals lead to ketosis and fatty liver disease. There is evidence that ketotic cows are less able to resist intra-mammary infection. For example, one study looking at energy status in the first 9 weeks of lactation demonstrated that 5% more cows had mastitis and 8% more cows had an elevated somatic cell count (SCC) if sub-clinically ketotic, than if non-ketotic. Furthermore, chronically ketotic cows were 1.7 times more likely to have an elevated SCC than cows that were not ketotic for two or more weeks in the post-calving period.

supplementation should be considered during periods where the immune system is under 'stress' due to reduced competency or of high levels of exposure to infectious pathogens.

Feeding supplemental vitamin E at 1000iu/day during the dry period and 500iu/day during lactation has been shown to significantly reduce the incidence and duration of intra-mammary infections and clinical mastitis. Another study found that feeding the same levels of vitamin E in the dry period (1000iu/day) reduced clinical mastitis at calving by 30% and that increasing this to 4000iu/day for the last 2 weeks of the dry period resulted in an 80% reduction of clinical mastitis at calving and a 60% reduction of mastitis cases.

### Micronutrient - Selenium

Trials have demonstrated that selenium supplementation can improve udder health, as measured by a reduction in somatic cell count. For example, cows supplemented with 2mg of selenium per day showed greater resistance to mastitis when experimentally challenged with E.coli compared to the control cows on a diet with 0.04ppm selenium.

### Short dry periods & mastitis

The effect of shortened dry periods on udder health is still under investigation. Cows with shortened dry periods compared to the conventional 60 days, do show less body fat mobilisation and decreased liver triacylglycerides post-calving which would suggest a positive advantage to udder health. Furthermore cows will have a lower yield at drying off which has been shown to be a risk factor for the acquisition of new intra-mammary infections during the dry period.

On the other hand, short dry periods will reduce the period of time where the udder is completely dry which is accepted as the time when the gland is most resistant to infection and also potentially reduce the exposure to antibiotic dry cow therapy, thereby reducing the opportunity of removing pre-existing infections.

A review of data from field studies of US dairy cattle concluded that "herds with mastitis problems should be cautious in shortening days dry because short dry periods led to higher cell scores in the subsequent lactation compared with 60-d dry". In contrast, a study in Denmark comparing 4, 7 and 10 week dry periods found no difference in clinical mastitis rate between the groups. Given the current lack of understanding it would be advisable to only consider short dry periods where clinical and sub-clinical mastitis is not a problem.

<b>Pre-Calving</b> Obesity (BCS>4.0) Severe feed restriction Feeding excess energy Long calving interval	 ++ +++ ++ +
<b>Post-Calving</b> Diseases and infections Fasting Feed restriction Ketogenic diets Sudden feed changes	 ++ +++ ++ + +

**Table 1: Risk factors for fatty liver in lactating dairy cows**  
The number of + represents slight, moderate, and strong risk factors for fatty liver.

### MICRONUTRIENTS - Vitamins A & E

Cows must obtain their requirement of vitamins A and E directly from the diet. Vitamin A is involved in resistance to infection, particularly mastitis. Supplementation of vitamin A should be specifically considered in diets containing high levels of concentrates, low levels of green forages, high levels of poor quality forages and in the time around calving (the periparturient period.) Additionally,

However, there is no clinical evidence for an improvement in udder health beyond a supplemental level of 0.3ppm selenium.-

### Mycotoxins

Mycotoxins are recognised as having the potential to lower immunity. A reduction in mastitis and cell counts has been seen on some farms following the removal of contaminated feed or the use of a mycotoxin absorbent.





The most obvious signs of heat stress are increased respiration (panting) and water consumption, resulting in reduced fertility and milk yields. However, another adverse effect of heat stress which is often overlooked, is the increased incidence of both clinical and sub-clinical mastitis.

High yielding cows fed appropriately are generally never cold as they can be compared to walking furnaces. For example, a 600kg cow producing a modest 30 litres/day, generates around 1.4kW/hr of heat energy. Inevitably, this heat production increases the chances that she will be heat-stressed at higher temperatures.

Today's Holstein cows are 'working' harder to utilise the vast amounts of feed offered to them in supporting their needs. The 'work' involved in digestion creates more heat energy which needs to be removed from the body. This is harder to do in our 'muggy' British climate and so can lead to mild heat stress in average UK conditions, with high yielding cows being the most at risk.

The immediate observed signs of heat stress are shown in table 1, and a summary of potential consequences in Table 2.

Heat-stressed cattle change their eating behaviour, selectively eating feeds which are readily digestible and leaving the forage/roughage element. Besides selectively eating feeds, their total feed intake is reduced. The consequences are a reduction in milk yield, and decreases in both butterfat and protein levels. The knock-on effect of selective feeding may also be acidosis, due to the changing forage:concentrate ratios, and also the onset of ketosis.

A decline in fertility following periods of high temperature has also been reported, either as a reduction in the number of observed heats (the heat period is shorter, there are fewer standing mounts and more silent heats) or cows not holding to service.

Factors contributing to Heat Stress

Dairy cows need to maintain a constant body temperature at around 38°C. The key factors influencing this are: air and radiant temperature, wind speed and relative humidity.

Air temperature and radiant temperature directly influence the heat exchange ability of the animal. As wind speed increases, so does the amount of heat transfer from the surface of the cow. Increasing airflow over a cow has a dramatic effect on evaporative

heat loss from the skin. Air flows as low as 10 km/hr (2.8 m/sec) can reduce respiration rates in heat stressed animals by as much as 50%.

When the relative humidity increases, animals will become heat stressed more quickly. In winter, it can make the animals' coats wet which reduces their insulating properties. In summer, it reduces evaporation and limits heat loss.

Above a temperature of 25°C, cows attempt to lose heat by sweating. So heat stress is often considered to be a summer problem.

However, cows housed in the winter can also become heat stressed, especially where ventilation is poor. For instance, the average temperature in the West Country during the winter is 8-10°C, however inside a fully stocked building the temperature can be up to 10°C higher than the outside ambient temperature. Add to this a relative humidity of around 55% and animals 'feel' the temperature is higher by about 8°C (ie 26-28 °C). So it is quite feasible for many herds to be suffering mild heat stress as a consequence.

Heat stress and mastitis

Heat stress is believed to increase mastitis incidence due to: 1) heat and humidity increasing the pathogen load in the environment, hence a greater incidence of mastitis in warm weather. And 2) evidence suggests that some of the seasonal changes in the levels of mastitis may be due to a decrease in resistance of the cow's immune system - a consequence of metabolic diseases, nutritional management, and heat stress. What is known for certain, is that cooling cows down leads to a reduction in the level of mastitis.

Combating Heat Stress

First steps in minimising the risks of heat stress, and cooling cows down, is the provision of cool, clean water and shade.

Housed cows - air movement is essential, in addition to shade and water, the latter for drinking and also for direct application to the cow. However, care is needed as humid conditions or poor ventilation may make the

heat stress situation worse. Additionally, it is imperative that overcrowding is prevented as this reduces airflow over the cows, reducing their ability to get rid of heat, and also increases the heat generated in a given area.

Cows at pasture - shading from direct sunlight is imperative and cows will positively seek out shelter. But care must be taken not to create foul and damp underfoot areas as a result of cows always congregating in the same space - this increases the bacterial load on cows' teats and therefore clinical mastitis. Water should be close to shade as cows will not walk far in high temperatures, humidity and sunshine.

Cooling cows while at pasture can be achieved by the provision of cooling ponds, as cows willingly immerse themselves in water. There is some debate as to whether this can increase mastitis incidence or not. The contrasting viewpoints may be a result of the way purpose-built ponds, often with moving water, are managed versus natural ponds.

In the dispersal yards and feeding areas, the installation of fans, combined with spraying water onto cows can also be useful to increase evaporation rates as cows 'sweat' and so dramatically reduce the effects of heat stress. The combination can also have benefits in fly control.

Ration changes - Provide a more energy dense diet to compensate for reduced intakes, but be wary of not upsetting the forage:concentrate ratio. The mineral content may need adjustment to replace that excreted by the increased sweating.

Feeding times - Increasing the amount of feed available during the cooler part of the day is also important - feeding 60-70% ration between 8pm and 8am has successfully increased milk production during hot weather. If the cow's feed intake matches her requirements there is less chance of her being susceptible to diseases such as mastitis.

Handling times - Additionally, heat stress can be reduced by avoiding any stressful handling of cattle during the hottest time of the day.

# HEAT STRESS AND MASTITIS

Signs of Heat Stress

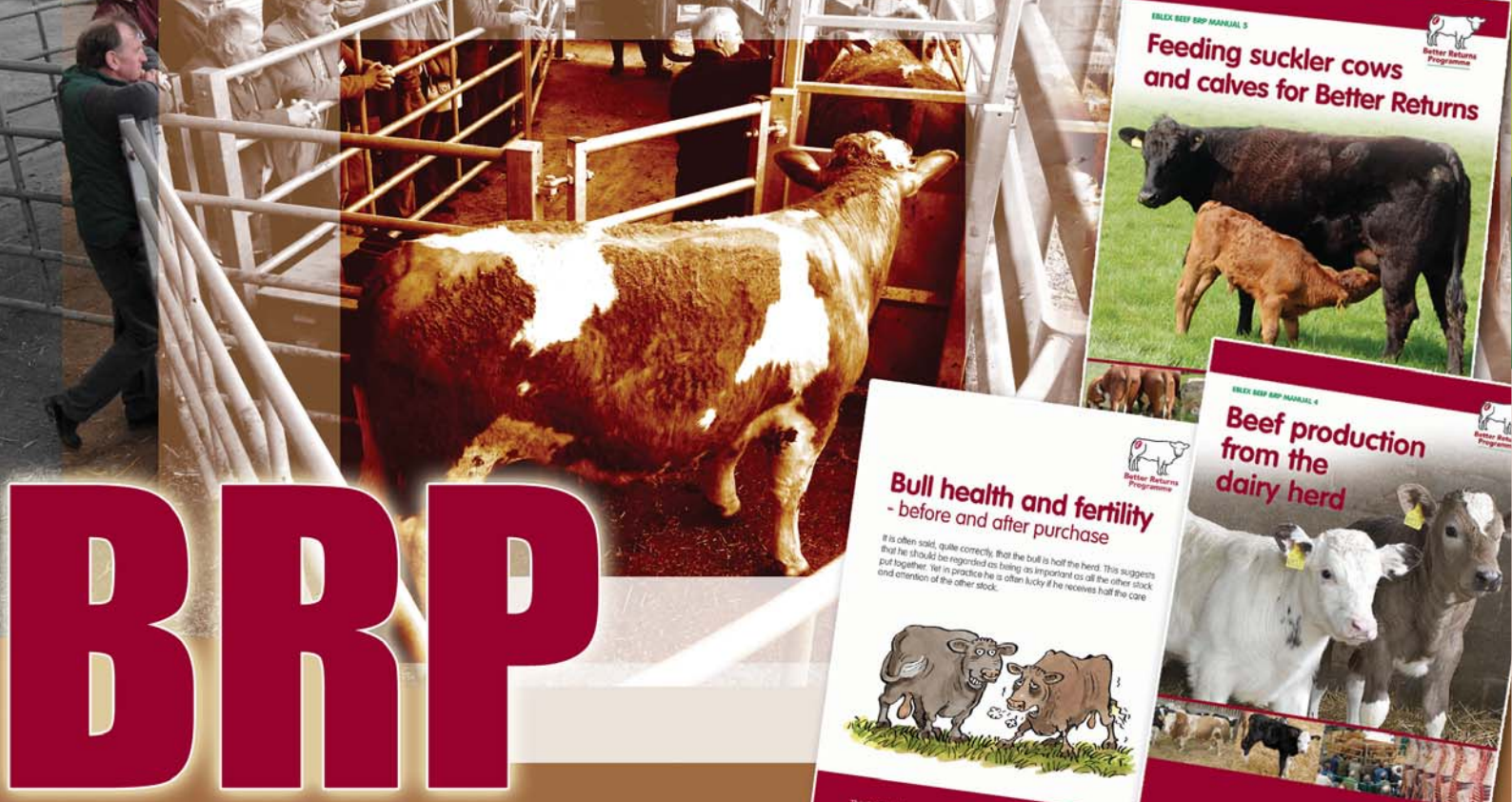
- Respiration rate increases (panting)
- Increase in water intake
- Eating readily digestible feed
- Avoiding forage/roughage element
- Reduced feed intakes

Consequences of Heat Stress

- Reduction in milk yield
- Reduction in milk quality
- Acidosis
- Ketosis
- Decline in fertility
- Increase in SCC
- Increase in mastitis cases

Heat Stress and Mastitis Heat stress in cattle is not just a problem during long hot dry summers, it can commonly occur when cattle are housed in the winter. In a paper presented to the British Mastitis Conference in 2007, Brian Pocknee, Senior Consultant with ADAS reviews the issue and provides practical advice for consideration.





The EBLEX Beef Better Returns Programme (Beef BRP) is nearly two years old and more than 10,000 beef farmers are taking advantage of the many technical leaflets, manuals and other innovative material available. And that's not to mention the hundreds of people who have attended events providing practical advice and top tips on a wide range of subjects.

'To start getting the most from Beef BRP you just need to make a quick phone call,' says Netta de la Cour, Beef BRP Project Manager, EBLEX. 'Once registered on the programme, you will receive a free copy of each manual and the technical leaflets that are of most interest to you. You will also be invited to events that are being held in your area, which are completely free to attend.'

#### Five manuals are available right now

**1** - Choosing bulls to breed for Better Returns deals with each stage of the decision-making process involved in buying a stock bull or making an AI decision - from identifying drivers for the profitability of a herd, through setting specific breeding objectives, to interpreting EBVs when buying a recorded bull. It also deals with the difference between terminal sire EBVs (where the potential effect on returns is achieved directly through the bull's progeny) and maternal traits (when breeding female replacements, for example).

**2** - Beef selection and handling for Better Returns is full of top tips and practical pointers, helping you ensure you are sending cattle to slaughter at the best time to earn the optimum price. Simply by choosing a market to target and making selection and finishing decisions based on the needs of that market, producers can make better returns. The manual goes through the key handling points for assessing fat class and conformation on a beef animal and includes information on the different needs of the market.

**3** - Improving cattle handling for Better Returns provides fascinating insight into the psychology of cattle, focusing on the best methods to herd and move animals, as well as some practical hints and tips on handling facilities. There are all sorts of benefits to improving cattle handling systems - safety, happier animals, fewer meat quality issues, reduced labour costs. This manual helps producers to see things from the point of view of their cattle.

**4** - Beef production from the dairy herd suggests that dairy producers could be making better returns through the use of EBVs, sexed semen and by finishing cull cows with a target market in mind. A beef cross calf can be worth around £100 more than a dairy bull calf, better breeding can add another £30 to that price. More attention to cull cows can make an extra £30/cow on top of this. Altogether, a few improvements to a dairy system could make the equivalent of an extra 2p per litre (per cow with an average lactation).

**5** - Feeding suckler cows and calves for Better Returns is the latest manual from Beef BRP and runs through the best feeding regimes for suckler cows, calves and bulls to achieve the best result. With the cost of feed going up all the time, the key message of this manual is to make the most of what you have available to you on your farm or locally - without compromising cow and bull fertility and calf growth.

Coming soon - manuals on costings, reseeding and cattle housing

For a **FREE** copy of any of the manuals, EBLEX levy-payers can call 0870 241 8829 or email [brp@eblex.org.uk](mailto:brp@eblex.org.uk)

#### Other material available through Beef BRP

Working with the National Beef Association and XLVets, Beef BRP has produced a leaflet on Bull health and fertility - before and after purchase.

'It is often said, quite rightly, that the bull is half the herd,' says David Black, Managing Director of XLVets and technical author of the leaflet. 'This suggests that he should be regarded as being as important as all the other stock put together, yet in practice he is often lucky to receive half the attention and care that he should.'

The leaflet guides producers through the 'do's and don'ts' of buying a stock bull and contains some top tips on introducing him to the herd and his new environment.

Well managed grass delivers a low cost feed and potentially can provide growth rates of 1kg/day or more. More profitable beef from grass has been produced in association with the British Grassland Society.

A new Beef Diseases Directory has been produced to run through some of the most common diseases in UK beef herds and includes some best practice advice and herd health tips. The new Mini feeds directory is full of information on various feeds for use in the beef herd, helping producers to formulate correct rations, cut costs and achieve better returns. Farm herd health planning - cutting disease costs for better returns provides advice on keeping disease out of your herd.

Better Returns from buying and selling store cattle does what it says on the tin, and provides some good advice on what to look for when buying and selling store cattle.

The Beef BRP team has produced a set of Cattle finishing performance targets. The information is presented in the form of a 'turn and reveal' disc covering a range of different cattle types.

**All of this material, and information about events, are available from the Beef Better Returns Programme - just call 0870 241 8829 or email [brp@eblex.org.uk](mailto:brp@eblex.org.uk)**

## Herd Health and Fertility

- a Bonus from Correctly Managed Nutrition



Herd health is one of the major requirements for successful dairying. When Robert and Matthew Gardiner, North Hill Farm, Tunley, near Bath, adopted a team approach to tackle the issue of low butterfat, they did not expect to see such dramatic improvements in herd health and fertility as a result of the change of diet. The healthcare team of Robert, Matthew, Keenan Rumans Consultant, Mark Voss and XLVet Michael Head from Shepton Veterinary Group, explain their approach..

The main reason for a change of feeding regime for the 150 large British Friesians was to try to improve the levels of both butterfat and protein in their milk. 'We are selling our milk to Wyke Cheese, and when you are supplying a cheese maker, it's crucial that milk quality is both high and consistent' says Matthew. The Gardiners are currently receiving 27 pence per litre, and as they are paid on quality, this is the key to a profitable business.

A family business, North Hill Farm covers 500 acres, where wheat, barley, maize grass and 30 acres of rape are grown. 'We've been Keenan owners since 1990, but we have never used Keenan nutrition, as we decided we would just continue to carry on with our own guy' explains Matthew. Their original nutritionist was employed by a feed company, and Robert and Matthew soon began to realise that the advice they were being given was very biased. So, they decided to change to another nutritionist, who was independent, as last summer the butterfat levels were at an all time low.

Initially, things went quite well, but problems soon began to 'kick in'. 'We were being advised to feed cake in-parlour to the high yielders, 10 kgs for 50 litre cows, and 8/8.5 kgs for 40 litre cows' Matthew comments. 'Of course, as you would expect, milk yields peaked immediately and highly, but the 'ski-slope' effect soon kicked in!' Butterfat dropped to 3.3% and he was beginning to worry about losing the Wyke contract.

Matthew discussed the problem with Keenan's Mark Voss, who offered to visit the farm and help out. On his subsequent visit Mark was 'concerned' at the advice the Gardiners had been receiving. 'When I first went to North Hill, an excessive amount of concentrate was being fed in-parlour.' Quite a lot of maize silage was also being fed, plus home grown cereals, so there was a lot of starch in the overall ration leading to far too much rumen activity, subsequently reducing butterfat levels, and contributing to other issues such as

lameness' explains Mark. He continues 'The cows were experiencing the classic high peak, but quickly falling off in lactation, and this was certainly not helping fertility.' Too much was being asked of the early lactation cows.

Matthew agrees that they were having a great deal of trouble with fertility, even seeing when cows were bulling, but had not put these problems down to feeding issues. 'We were wasting a lot of money on fertility aids, we would PD a group of cows and only 30/40% would actually be in calf.'

When Mark heard about these herd health issues plus butterfat problems, he changed the emphasis to getting more milk later in lactation, easing the pressure on the cows to keep them healthy. 'I introduced Soda Grain into the ration, drastically slashed parlour feed, and the cows are now on more of a single Mixed Ration.'

Robert and Matthew are 'amazed' at the difference in herd health since working with Mark. 'We were not expecting such results, but this winter the cows are bulling very strongly, and a few weeks ago, we PD'd 10 cows and almost 100% of them were in calf!' They also have no concerns about body condition gained in late lactation, as the cows are using the extra energy to produce extra litres.

Mark says 'This has not been an overnight 'fix'; it's taken a month or two for stale cows to pick up as they progress through lactation. He explains 'We are now working with the cows, ensuring that they are giving butterfat and protein later in lactation, rather than constantly asking for more when they are at their peak'. He is looking forward to implementing the Keenan Dry Cow System, which is a low energy, high fibre feeding regime to North Hill, to get the first months of lactation off to a much better start.

The Gardiners' vet, Michael Head of Shepton Vets has also been impressed with these improvements. Michael explains 'Our team

of seven dedicated dairy vets have been responsible for the veterinary care at North Hill Farm for just over two years. Lameness had been an on-going problem. The herd was locomotion scored to exactly measure the extent of the problem, and from this a prevention and treatment plan was formulated. This has involved the construction of a double footbath at the parlour exit, the regular attendance of a foot trimmer, and Andrew, the excellent dairyman going on a foot trimming course conducted by the practice. Both Robert and Matthew are pleased with the dramatic improvements in lameness control.'

'The Farm Team met bi-annually to discuss health and production issues. However, it was becoming increasingly difficult to communicate. I attend the farm on a regular fortnightly visit, and it was apparent that the quality of bulling was poor, and, as a consequence conception rates were low. Through regular body condition scoring it also became apparent that some cows were losing in excess of one condition score in the first 100 days of lactation! This is significantly correlated with poor conception rates. Energy problems were detected when a blood metabolic profile was conducted in some fresh calved cows. The farm was also having unacceptable numbers of left-displaced abomasums (LDA).'

'Combined with the low milk butterfats, milk proteins and communication problems, Keenan Rumans were taken on as nutrition advisors. The team, working closely with Keenan's Mark Voss, is now very happy with the improvements made in milk quality through the nutrition advice correcting ruminal acidosis, fertility, including bulling behaviour and continuing improvement in lameness. Well done everyone!'

Matthew concludes 'Working closely as a team with Keenan dedicated nutrition alongside our veterinary service has certainly proved to be extremely beneficial for herd health and profit at North Hill Farm.'

