

Effective measures needed to minimise cattle lameness

THE 2014 Cattle Lameness Conference, held in Worcester last month, drew some 80 researchers, veterinary surgeons and company specialists. Nick Bell, who introduced the speakers with enlightening cartoons, pointed out that since the last conference there had been over 500 peer-reviewed papers published.

The growing evidence-base was applauded but by the end of the day the overall impression was that there is still very much more to be unravelled about issues to do with the bovine hoof.

Sole ulcers

Professor Karl Nuss (University of Zurich) gave an in-depth review of the development of sole ulcers and associated pain. Sole ulcers are painful when pressure is applied but they do not always result in lameness. Cows are able to hide their pain and gait is not always affected but as a risk for culling, sole ulcer is considered to be a major factor.

Utilising videos of cows walking on a moving treadmill, the normal weight-bearing attitude of the foot was demonstrated. The images showed the twisting and placement of the claws of the hoof.

It was shown that the greatest pressure was when the hoof has first contact, then lower pressure when the leg is upright with increased pressure as the cow moves forward.

These points of pressure explain how damage to the hoof occurs. The lateral claw touches the ground first and the heel, in both the fore and hind limbs, impacts first.

Comparisons with elk indicate that paired toes of the bovine foot differ

in length and there is a natural genetic disposition to claws of different lengths. This difference has not been shown to result in an increase in sole ulcers. The mechanical impact that is transferred from the pelvis directly to the longer lateral digit in the hind limb may play a role in the pathogenesis of

RICHARD GARD attended the 2014 cattle lameness conference last month and found there is still very much more to be unravelled about issues to do with the bovine hoof



sole ulcer. Further studies are ongoing.

Observations of claws from cows leaving pasture and after the cows are housed show a rapid change in the contour and shape of claws. On hard ground there is "an overwhelming predisposition of the lateral claw of the pelvic limb to overload and develop a sole ulcer".

Prof. Nuss said that mechanical factors rather than systemic inflammatory factors are the main cause of sole ulcers.

In discussion he indicated that the detection of early sole ulcers is best carried out when the cow is standing as cows can mask the pain when they walk. Monitoring the standing cow is expected to be suitable for automated detection.

Claw lesion treatment

Margit Groenevelt (University of Bristol) introduced the findings of a combined study involving veterinary and social science to advance effective claw lesion treatment.

Her colleague Sue Horseman had carried out farmer interviews and assessments. Four dairy herds were involved and the cows scored for lameness every two weeks. Cows were matched for parity and stage of lactation and randomly allocated to a treatment and control group.

As a cow showed score two in the treated group she was treated using the Dutch five-step method within 48 hours.

Control cows were treated as the farmer saw fit. Sole haemorrhage and digital dermatitis were the most prevalent conditions. Recovery rates at two weeks



Jon Huxley (left) with Hettie Thomas, Jo Speed, Jim Willshire and Margit Groenevelt.

after treatment were 78% for the treated cows and 21% for the controls.

It was discussed that the poor results from farmer self-treatment explains why farmers get demoralised by lameness treatments as they see little success for their efforts. The motivation to identify and treat lame cows is limited. It was commented that "never getting cows lame is probably the best cure".

Telephone interviews with 84 farmers and face-to-face discussions with 12 of them investigated farmer attitudes to detection and treatment of lame cows. The majority of the farmers were confident in their ability to detect lame cows and half of them expected to treat lameness within 48 hours.

Different understanding

The term "lameness" was reserved by farmers for "severely lame" and therefore the low detection levels recorded by other workers may be correlated more with alternative language than low detection ability. An understanding of "treatment" also differs.

Hoof trimming and placing a cow on straw may or may not be considered as treatment. Understanding a farmer's point of view towards lameness is important if improvements are to be achieved.

Hettie Thomas (University of Nottingham) described a treatment study for newly lame cows in one claw. The final analysis of the results will be published later.

The "control" was a five-stage therapeutic foot trim which would provide a resolution in about 67% of cases. Adding a hoof block improved matters further.

Hoof trimming with a NSAID increased the success rate to around three quarters of cases and the best outcome was from trim, hoof block plus NSAID.

In terms of herds rather than cows, early treatment resulted in no severely lame cows with the overall incidence of cases falling. It is clearly important to have accurate assessments of the effectiveness of treatment programmes.

Although a lameness incidence of 20% is achievable, there is a discussion around what that really means and whether such figures are acceptable. Clearly, 0% category three cows is a clear achievement at the herd level.

Role of treponemes

Following the development of antibody-based technology, treponemes have been isolated, identified and their role in digital dermatitis examined. Stuart Carter (University of Liverpool) explained that three treponeme phylotypes were shown to be present together in almost all bovine digital dermatitis (BDD) lesions but were not detected on normal cattle foot skin.

Investigations have also shown that the main, and probably only, infection site is the BDD lesion. Slurry samples have proved to be negative.

The same organisms are responsible for DD in goats and sheep. Lesions in cattle have typically been recorded between the heel bulbs but lesions are



Stuart Carter (left) with Nick Bell and Professor Karl Nuss. Below: Niamb O'Connell with Brian Pocknee.



Claws at pasture and after two months in house [photos by courtesy Prof Karl Nuss].

now seen on the coronary band at the front of the hoof. The treponemes penetrate the skin through the hair follicles, form a lesion which is then colonised by secondary bacteria which leads to a full-blown incidence of digital dermatitis.

Antibiotics only attack the secondary infection. It is believed that the lower incidence of BDD with cows at grass is because of the reduced risk from secondary infection.

Treponemes have been detected within bacteriophages and this may provide a means of transfer between cows.

Prevention has to be the best approach and work is ongoing to identify suitable vaccine candidates.

With BDD, cows generate a non protective antibody response which is maintained during clinical disease and any vaccine will need to overcome this.

Additionally, there may be opportunities with genetics as BDD has a host-specific susceptibility. The future for BDD management is seen as a mixture of vaccines, good farm practice and effective treatment.

Niamh O'Connell

(Queens University Belfast) has looked into practical solutions on farm to the problem of digital dermatitis. The time spent standing in slurry has been linked to BDD incidence but this may be due to an increase in skin permeability.

Some cows persistently suffer from BDD and others do not and this may be linked to different behaviour of individuals within a group regarding standing time and slurry immersion.

Foot-bathing is commonly carried out on farm but there are wide differences between the products used and the management of baths. Parlour washings and hypochlorite have been shown to have no beneficial effect but are commonly used.

The environmental concerns regarding the disposal of a 5% solution of copper sulphate indicate unacceptable usage but this has been found to be the most effective for disease control.

Lower concentrations are not effective but many farmers surveyed do not know the concentration of the copper sulphate being used. There is a need for clear, practical advice to farmers.

Practitioner's view

The impact of lameness from a

practitioner's point of view was highlighted by Jim Willshire (Endell Veterinary Group).

Clinical lameness decreases lactation yield but the timing of the lameness influences the effect. The pain of lameness increases lying down time and reduces feeding, leading to an energy imbalance with an increase in metabolic disorders.

Stating that thin cows get lame and that lame cows get thin, he said that once thin a cow is more likely to get lame. The impact of reduced mobility on udder health is a concern and poor foot health may lead to more clinical mastitis.

Foot lesions have been shown to increase the calving to conception interval by up to 40 days. Cows visited every two weeks that are lame at both visits before AI have shown a 49% drop in conception rate. The effects on fertility are not straightforward.

Lameness leads to an increase in culling, both for direct lack of mobility and also concurrent disease. The results of a study into the effect of lameness on conception, from an

18-month study of 836 cows, are due for publication.

Steering group

In 2013 the Dairy Cattle Mobility Steering Group was set up. This involves all aspects of cattle lameness with representation encompassing the technical and the practical.

Jo Speed (DairyCo) described the background to the establishment of the

group and the aims. Basically it appears that information will be gathered and communicated with activities and recommendations brought to the attention of the industry.

Achievable, affordable and effective measures to minimise lameness and maximise mobility are being targeted to eradicate severe lameness.

Posters

Seven poster presentations were judged by the delegates and the best poster awarded to a combined team from the RVC, Bristol and Oxford on "Quantifying transitions between different levels of mobility score in dairy cows". With fortnightly mobility scoring, the majority of cows will be detected as MS2 before progressing to MS3.

• The conference was organised by the RVC, The Dairy Group and Nottingham University. For the proceedings, visit the website www.cattl lamenessconference.org.uk.

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