Lameness in dairy cows: the developing story

With 35 years’ experience as a cattle vet, Dick Sibley gives a personal view of how approaches to lameness in dairy cows in the UK have changed over the years and where the challenges remain.

MY professional career has spanned five decades. In that time I have experienced some major animal health disasters involving cattle. Bovine spongiform encephalopathy (BSE), foot-and-mouth disease and bovine tuberculosis (TB) have threatened the industry that I serve, and cost millions of pounds. But lameness has inflicted more pain and suffering on more cows during those decades than any, or all, of those animal health catastrophes.

Early experience
I qualified from the University of Bristol in 1977 and joined a traditional mixed practice in Horsham, Sussex. In my first job as the nipped vet, my morning round list generally comprised dehorning and castrating cattle and looking at lame cows, with the occasional welcome interruption of a calving or a milk fever. As the youngest and fittest in the practice, armed with little more than enthusiasm and naivety, I tackled my morning’s physical struggle with ungrateful patients with the appreciation that I was earning a living for the first time and playing the Herriot role as a real vet.

The lame cows were the nearest thing I got to having to carry out a clinical examination, make a diagnosis and provide a treatment in accordance with my clinical training. History taking was generally confined to asking how long the poor cow had been lame, and in some cases, asking tactically which limb the farmer thought she was lame on.

My favourites were those cows that got better and made a full recovery with the judicious use of the foot knife and a can of purple spray. Cattle lameness was a sporadic clinical problem of individual cows that was treated classically with little recording or monitoring of incidence or prevalence. My impressions of the causes and incidence of different lesions were confirmed by a survey of cattle lameness by veterinary practitioners in 1977, and published by David Weaver and colleagues in Veterinary Record in 1982 (Russell and others 1982).

The enthusiasm for treating lame cows soon wore off among most new graduates in practice within the first year or two, the handling facilities on many farms comprised a rope and beam, with some farmers even insisting that the use of such modern mechanical aids would threaten the cow’s welfare and result in a broken leg. Brute force and a strong back were required. The idea of putting a lame cow in a crush was frowned upon in case it would ‘go down’. Within a few years, the four words of dread – “While you are here” – drained the spirit of any visiting vet after calving a cow, dehorning the bullocks or taking the Brucella bloods, as the farmer magically conjured up two or three lame cows to add a precious half hour to the day, stealing the time from a lunch break or a reasonable finish before dark.

Growing problem
Even by this period in the history of cattle disease, there was a growing appreciation that lameness was a growing problem. David Weaver and colleagues published the first edition of Cattle Lameness in 1972, which became the must-have textbook for aspiring cattle vets. Ownership of the second edition of 1981 really marked a commitment to cattle health, describing as it did the clinical features of a multitude of lesions and injuries involved in cattle lameness. But in reality, white line abscesses were the problem most commonly seen in practice; they were sporadic and relatively easy to treat. The occasional refractory case required a more careful search of the smallest of black holes, and some became an issue of penicillin deficiency; but in general most got better and made a full recovery with the occasional welcome interruption of a calving or a milk fever.

Rise of the sole ulcer
Lameness changed in the early 1980s. The sole ulcer became the predominant cause of chronic and painful lameness. Instead of jets of pus discovered in the lateral white lines of...
lame cows, deep-seated granulation tissue beneath overgrown horn of the outside claw of the back foot became the commonest presentation. These cases were not easy to treat, as they involved painful and sensitive lesions that made it difficult to handle cows using the rope and beam system. How those poor cows suffered. All sorts of pain were inflicted in the name of treatment procedures and remedial trimming, which involved removing the granulomatous tissues and attempting to prevent recurrence. Every veterinary practice concocted its own mixtures and potions to apply to the ulcerated sole in a vain attempt to get the horn to regrow. In reality, very few were cured, although alleviation was possible by judicious remodelling of the foot. For me, my Eureka moment was a move to Devon, where my pioneering colleagues (David Temple and the late John Malseed) introduced me to the use of the wooden block. By 1980, we were routinely sticking blocks on cows with sole ulcers, alleviating pain and helping the injured sole to heal.

Farm animal veterinary practice can be very isolated; learning by trial and error or bitter experience within a small, albeit progressive, practice was slow and unacceptable. During the 1980s there was a developing appreciation that continuous professional development was integral to progressive veterinary practice. The British Cattle Veterinary Association (BCVA) became established as the primary provider of CPD for cattle vets; formal presentations and scientific papers filled four meetings a year, but the real work and learning was done in the bar. To some, it was a sad image of the profession. We were doing on the day that John F. Kennedy was assassinated in Texas. Cattle vets of a certain age know what they were doing on March 20, 1996, when Stephen Dorrel, the then Health Secretary, announced to the world that there was an association between BSE and cows and a scourge of the modern dairy industry.

Roger described an outbreak of small skin lesions between the heels of dairy cows, causing acute lameness but readily treated by the excoriation of the lesion and the application of gentian violet and oxytetracycline. Our North American colleagues described this disease as ‘hairy warts’ and admitted a familiarity with it, while perhaps understating the possibility that we might have imported it with their Holsteins. The disease spread quickly between herds and within herds and remains a major problem in dairy cows to this day.

John Webster at the University of Bristol was also raising concerns about the welfare of farm animals, particularly dairy cattle, and using the letters columns of Veterinary Record to highlight his concerns (Carter and others 1991).

Rather than being dismissed as a fringe wellfarist, Professor Webster was putting a scientific bent to the welfare debate, with constructive ideas on how the developing problem might be managed. Yields, energy deficits, and the metabolic demands on the high-yielding dairy cow became his focus; these concepts have since been embraced by vets and farmers and have become the mainstay of dairy cow husbandry and management to maintain cow health. We now know that the energy demands on the cow, highlighted by Webster, predispose it to the multitude of problems that occur in early lactation, including lameness. The health destiny of the cow (including lameness) is set in these first few weeks (Webster 1993, 1994). But his work was overshadowed by the developing storm that was BSE.

**Effect of the BSE crisis**

Those of a certain age know what they were doing on the day that John F. Kennedy was assassinated in Texas. Cattle vets of a certain age know what they were doing on March 20, 1996, when Stephen Dorrel, the then Health Secretary, announced to the world that there was an association between BSE and a new variant of CJD in young people. The cattle world imploded. This news potentially signalled the end of the UK dairy cattle industry. Plans were drafted to slaughter the entire UK cattle herd, which was one way to solve the lameness problem! Bizarrely, in the end, the beef sector took the brunt of the inevitable crisis, and the dairy sector, which had been the main problem with BSE, escaped relatively unscathed. The BSE crisis galvanised public interest in farm animal production systems, and retailers (perceived as the guardians of the public interest) raised concerns about the implementation of quality assurance beyond...
the farm gate. Coincidentally, the Farm Animal Welfare Council (FAWC), under the chairmanship of Sir Colin Spedding, became interested in the dairy cattle sector and commissioned a report into the welfare of dairy cows.

The FAWC Report on the Welfare of Dairy Cattle was published in 1997 (FAWC 1997). It contained a plethora of realistic and justifiable criticisms and recommendations, including the following paragraph on lameness: ‘All dairy farmers and stockmen must take heed of this serious problem, monitor the situation and take appropriate preventive and corrective action. Veterinary advice may be required. The issue already is a matter of public concern, and if action is not taken, there may ultimately be calls for legislative control. FAWC intends to review the situation in five years and comment to Ministers, as necessary.’

The threat of legislation to deal with dairy cow lameness goaded the industry into action. Indeed, the report nourished the interest of two significant organisations: the RSPCA, in the guise of its Freedom Foods assurance department, and Unigate, a significant purchaser and processor of milk. These two organisation collaborated with the BCVA to develop and introduce quality assurance schemes to include standards of cattle welfare, and introduced the concept of auditable written herd health plans for dairy herds. While the early sets of standards were based on measurable inputs such as the dimensions of a cubicle bed and the provision of feed space, the BCVA endeavoured to persuade those involved that the future of welfare assurance would be the measurement and monitoring of health outcomes, including lameness.

These embryonic quality assurance schemes led to the introduction of the National Dairy Farm Assurance Scheme, which in turn was the main instigator of what are now the Red Tractor Standards. The dairy industry took it upon itself to get its own house in order and demonstrate to an ever-discerning consumer that the products from dairy cows were not only safe, but also produced from animals that were healthy and well cared for. The group commissioned to set the standards for the national assurance scheme was aware of the difficulties of setting standards for health and welfare that had no reliable methodology for measurement. It was perplexed to discover that standard measurements of lameness, considered as one of the most significant welfare threats to the dairy cow, were not available. Even descriptions of lesions and interpretations of lameness varied with different workers, making the setting of rigorous standards impossible. The original requirement to simply record the treatment of lame cows and the response to treatment after seven days was met with derision and incredulity by the dairy industry and vociferous dairy farmers. An alternative to what was seen as an over-burdensome requirement to record lame cow treatments was needed to evaluate the number of lame cows in the herd regularly. A somewhat complex system of lameness scoring derived by Manson and Leaver a decade previously was introduced into the standards and adopted by the BCVA in its health planning system, but few adopted the system as the expertise to score reliably and repeatedly was lacking.

**Scoring and surveillance**

Few took up the concept of lameness scoring and lameness surveillance. The RSPCA now became involved, and drove its own farm assurance standards and auditing structure onward to meet the needs of its Freedom Foods Scheme, training its own assurance assessors in lameness detection and measurement. Meanwhile, the idea of assuring health and welfare and the potential to manage a measurable outcome was embraced by the developing team of welfare enthusiasts at Bristol university. Under the leadership of John Webster, and latterly David Main, the passionate team of vets and scientists in Bristol’s Farm Animal Behaviour and Welfare unit (and, in particular, the young and enthusiastic Nick Bell) became interested in farm animal production, and particularly dairy cattle welfare. Funding was eventually obtained from Defra to deliver a major project on dairy cattle lameness, initially to determine the effects of heifer management and husbandry on lameness in adult cows. This required the development of a robust and repeatable simple scoring system for lameness that could be readily adopted by vets and farmers as well as researchers and academics. Research from the group had already discovered the extreme variance between farmer records and perceptions of lameness (and mastitis) prevalence, and the reality as measured by robust monitoring (Bell and others 2006).

The outcomes of this original research were manifold, and included the novel concepts of farmer engagement in the whole process of health management. It was discovered that motivated and educated farmers could find their own solutions to problems, given the right technical help and proper resources. The tangible outcome was the development of a simple, repeatable and robust method of measuring herd lameness: mobility scoring, which has now become the standard method of measuring lameness. The system was announced to the profession in 2009 (Bell and Huxley 2009), and highlighted in 2012 (Sibley 2012).

**Research**

A significant effect of BSE has been to sap government research funds and starve researchers of money for many aspects of animal health and welfare. Funding for lameness research dried up. This disease has few friends; there are limited products that can be sold to profit from it, no vaccines, and relatively low use of antimicrobials and other pharmaceuticals. The pharma industry was not particularly interested in funding lameness research, government was concentrating on public health issues associated with farm animals, and the industry levy body, the Milk Development Council, focused its priorities on marketing rather than research. A relatively unknown but well-endowed charity, the Tubney Charitable Trust, came to the rescue.

Tubney was set up by Miles and Bryony Blackwell in 1997. Miles had been a successful chairman of the family book selling and publishing company. They both died, unexpectedly and at a relatively young age, in 2001. The Tubney trustees continued the work and pledged to use the funds as determined by the Blackwells, and spend out the entire fund. (The fascinating history of this organisation can be read in its publication Giving Our All: Reflections of a Spend Out Charity.)

By the time the charity closed its books on March 13, 2012, it had spent nearly £65 million, of which £20 million was spent on farm animal welfare. Its funding strategy was to support projects that would leave a legacy, and a major project to engage and manage dairy cow lameness was successful in securing significant funds. This was led by the Animal Behaviour and Welfare team at the University of Bristol, which had been established through the previous project funded by Defra.

The Tubney Trust Healthy Feet Project started in 2007. This major project did not centre on pure research, the group recognised...
that enough was already known about cattle lameness to make a difference to the growing problem. It had become evident that some 20 per cent of the dairy cattle in the country, over 400,000 cows, were lame at any one time – a near doubling of the estimated prevalence of the 1970s (Clarkson and others 1996).

There was a contention that the escalating lameness problem was due not to a lack of understanding of the disease, but to problems of awareness, dissemination of technical information to enable farmers and their professional helpers to take appropriate interventions, and resources to implement those changes.

Some 250 dairy farms, mainly in the south west, became engaged in the project. Half had expert interventions and the other half were monitored but had no professional interventions, acting as controls. One of the most edifying outcomes of the project was that the control farms improved their lameness prevalence nearly as much as the intervention farms. The simple act of measuring and monitoring created such an awareness that farmers became hungry for information and help.

One of the major successes of the Tubney Trust Healthy Feet Project was the partnership formed between the charity, the academics, the processors, welfare organisations, organic associations and the farmers themselves. Everyone pulled in the same direction, with the same aim and objective, without any government help or intervention. This collaborative approach could, and should, be used as the model for future industry-wide health and welfare programmes. The recommendations of the EAWC of 1997 had been implemented.

Another significant achievement has been the legacy. The procedures and protocols have been adopted in major funded regional projects such as the South West Healthy Livestock Initiative and, more recently, the national Healthy Feet programme sponsored by the industry levy body DairyCo. As a result, coordinated and structured lameness management is now readily available to any and every dairy farmer involving specifically trained vets.

Changing role of vets

I now rarely treat a lame cow. This is not just a function of age and decrepitude; most are treated by well-trained farmers, herdsmen or professional foot trimmers. The function of the veterinary surgeon has changed. Our time and professional skills are better used to approach the problem strategically, identifying issues and correcting the causes of lameness rather than its results. We still see new and emerging diseases of the bovine foot, and a trickle of research continues to feed our hunger for scientific discovery and novelty. Scholars such as those sponsored by the Dartington Cattle Breeding Trust and others continue an academic interest in lameness management, giving scientific rigour to developing strategies on prophylactic foot trimming and treatment protocols. But the major advances have been in the awareness and approach to lameness management on our dairy farms. Some of our pioneering dairy farmers now exult a zero tolerance of lameness as their objective. They focus their efforts on preventing the problem, knowing that lame cows are rarely cured. Housing systems, management systems and husbandry techniques now take lameness into account, and the success has been staggering. Many herds now have fewer than 5 per cent of the cows showing any form of lameness, compared to the average of 20 per cent just a few years ago.

Dairy cow lameness is not inevitable. An army of professional foot trimmers now tend the feet of thousands of dairy cows. They spearhead the growing group of paraprofessionals that will help us keep cows healthy. Their activities and procedures are under scrutiny and debate (eg, Blowey and Inman 2012; VR, January 5, 2013, vol 172, p 23). Meanwhile, the future for the veterinary practitioner will be to devise and disseminate strategic approaches to lameness management, focusing on prevention rather than cure. We now understand that the modern dairy cow needs regular care of its structures of the claw from the hostile environment in which the cow stands, walks, twists and turns. It really wants to spend half its life lying down in a comfortable bed, wandering to feed every now and again, and socialising with its herdmates.

Our job is to find ways of meeting these needs, providing the environment and husbandry that safeguards the cow’s health while maintaining its production efficiency. The future of lameness management will be the assessment, measurement, quantification and management of risk. This risk-based approach is now being developed by researchers and workers, and used by computer health management programmes (including myhealthyherd.com, with which I am involved), to help vets deliver a true predict and prevent model rather than the traditional test and treat. One day, cows’ feet will not need trimming or treating. They will work as they should without our interventions.

Developing a herd plan: tracks and gateways are a potential source of trauma and damage to susceptible feet

References

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