HEALTH

THE UNIVERSITY of EDINBURGH
The Royal (Dick) School
of Veterinary Studies

The Jeanne Marchig International Centre for Animal Welfare Education

What you will learn: How different *production* systems impact on welfare of dairy cattle

Welfare considerations related to the health considerations of dairy animals

Potential approaches to mitigate behaviour-related welfare issues in dairy animals

Potential opportunities to promote positive animal welfare through behavioural interactions

Lameness

Lameness is a debilitating and painful condition and thus is a major welfare problem in dairy cows. The origins of lameness are multifactorial. Lameness can result from interactions between farm environment (e.g., housing facilities, path condition, and floor type), farm management (e.g.,frequency of hoof trimming, and hygiene), nutrition,and animal characteristics (i.e.,breed, age and hoof conformation).

Access to pasture is beneficial in reducing lameness by providing soft and hygienic walking surfaces, promoting exercise, reducing restlessness and increasing lying times.

There is a perception that lameness is much less of a problem for cows at grass compared to cows kept indoors all year round.However, in countries with pasture-based milk production systems the annual incidence of lameness can be similar to that reported in housed production systems.

It is not only the presence or not of pasture that will determine higher incidence of lameness. Poor quality roadway surfaces, long walking distances to the milking parlour and poor herding skills contribute to the incidence of lameness in pasture-based systems.

Obviously severely lame cows are barely able to bear weight on the affected limb. Examples of severe lameness can be commonly recognized by farmers. However, lower degrees of lameness are harder to identify. Treating severely lame cows is more difficult, costs more and is less effective than treating cows before lameness has progressed to become severe. Therefore, early detection of lameness can be beneficial to achieve better treatment outcomes.

In addition, moderately lame cows may be in pain and treatment may be neglected if this is not considered to be worth addressing. Severe lameness deserves to be categorized and monitored separately. The recommended mitigation strategy for lameness includes regular gait scoring with early treatment of lame cows. Reducing the risk factors on farms will also help to reduce incidence of lameness on dairy farms. Dimensions and design of the lying area(s) and cubicle furniture should match the size of the cow ensuring that comfort is optimised, freedom of lying behaviour (natural postural changes) is allowed and risk of injury is minimised.

Dairy cows should be provided with dry, soft and deformable lying surfaces. Walking and standing surface should be clean, dry, non-slip and avoiding sharp edges. Tracks for pasture access should be suitable for long-distance walking (e.g. even surfaced, free from stones and debris).

Gait scoring is most accurate when done on flat, solid surfaces, which may be difficult to find in externally managed cows, or in indoor housing with suboptimal flooring.

Preventative hoof trimming (aiming to maintain correct weight bearing and minimize and prevent lesion development) is a key component of preventing lameness. Regular foot bathing is also recommended to reduce lameness caused by infectious diseases. Overgrown hooves are a risk factor for lameness, and the ideal frequency of preventative hoof trimming depends on farm management.

Early identification of lameness is, therefore, critically important for improving outcomes. Strategies to relieve pain and pressure on the injured area and promote healing include a trim that effectively relieves pressure, a hoof block, or an analgesic. Cows should be provided proper bedding such as sand or lime plus sawdust in the paddocks to provide comfort to hoof.

Mastitis

Mastitis is a disease characterised by inflammation of the mammary gland in response to trauma or infection, mostly bacterial, in the mammary gland. Depending on its severity, it can cause systemic illness and associated fever, dehydration, recumbency, and even death. Both local and systemic infection are associated with reduced milk yield and feed intake. Mastitis can be spread from an infected cow's udder and teat skin to uninfected cows during milking (contagious mastitis), particularly if good hygiene of milking equipment, whether in the parlour or by hand, is not maintained, or via bacteria in the cow's environment that enter the teat ends (environmental mastitis).

The condition can be divided into clinical mastitis (associated with clinical signs or symptoms) and subclinical mastitis (where an infection is present but has not yet caused noticeable disease). This is usually detected as a higher number of somatic cells in the milk(threshold of 200,000 somatic cells/mL) or heat or inflammation of the udder. Clinical mastitis is a painful condition and is associated with changes in behaviour, affecting dairy cow welfare.

Mastitis is a multifactorial disease, and the risk factors are diverse; no housing system (including access to pasture) has been consistently identified as superior to others with regards to the incidence or prevalence of mastitis. Type of bedding is a key housing-related hazard associated with mastitis prevalence.

Cows housed in sand-bedded cubicles have lower somatic cell counts than those housed in cubicles with organic bedding materials. Maintenance of bedding is also associated with risk to mastitis, but this differs based on the type of material used.

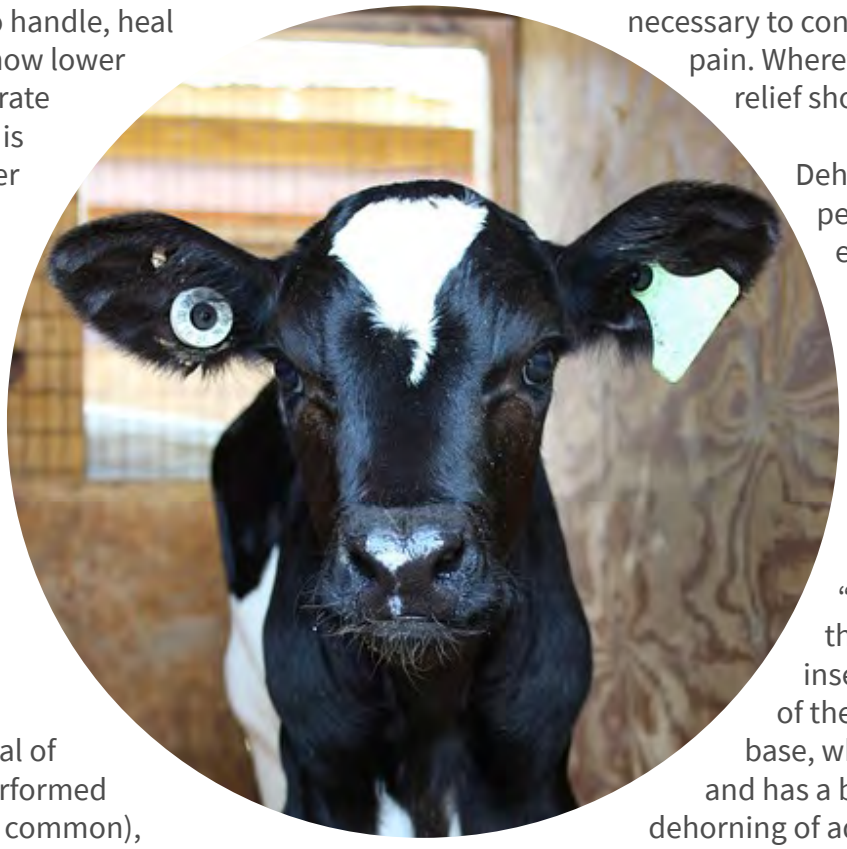
Assessment of key mastitis hazards, which are mostly cow and management related, should be undertaken regularly and a farm-specific plan for the control, including treatment and prevention of mastitis, should be formulated based on disease patterns and risks present on-farm. Udder health should be routinely monitored on farm using both the incidence rate of clinical mastitis and individual cow somatic cell counts to take timely and appropriate management decisions.

Signs of clinical mastitis include udder abnormalities (e.g., swelling, heat, hardness, redness) and changes in milk (e.g., watery appearance, flakes, clots). There is a strong body of evidence supporting the use of a non-steroidal anti-inflammatory drug (an analgesic: NSAID) for severe mastitis to reduce inflammation and other indicators of pain. The consistent use of pre- and post-milking teat disinfection procedures combined with proper udder preparation, milking technique, and equipment function (including hygiene if hand milking)are all important factors to preventing udder infection. Keeping the cow and her environment clean and dry is a key factor to reducing the risk of udder infection.

Painful procedures

Disbudding and dehorning

Disbudding and dehorning are procedures to permanently prevent horn growth (disbudding) or remove the horns in older animals. This is done for the safety of cattle and personnel when cows are housed in close proximity and can cause damage to one another. All methods of disbudding and dehorning are painful at any age. However, animals are easier to handle, heal more quickly, and show lower reduction in growth rate when the procedure is performed at younger ages.



Disbudding is the removal of the horn bud before it has attached to the skull (normally before 2 months of age). Disbudding is always preferable since is less invasive and less painful than dehorning (horn removal after attachment). Removal of horn buds can be performed using hot-iron (most common), caustic paste, or using knives (or 'scoop').

Disbudding may need to be delayed in exceptional circumstances to ensure proper application of the procedure; in case of a sick calf or one whose buds are insufficiently developed at two months (horn buds develop earlier in Holstein calves compared to beef breeds).

Proper procedures are important to prevent injury, infection, and re-growth (and subsequent need for a repeat procedure). When using caustic paste, it is important to ensure it does not spread to other animals (in groups or adjacent pens) or to other areas of the treated animal (a particular risk if the calves are outside and it rains). For all methods, a local anaesthetic is needed to reduce the pain during the procedure and an analgesic is necessary to control longer lasting pain. Wherever it is available, pain relief should be used.

Dehorning can be performed using embryotomy wire, guillotine shears, or dehorning knives, saws, spoons, cups, tubes, or high-tension rubber bands. When cattle have large horns, they are sometimes "tipped", a procedure that removes the insensitive sharp end of the horn but leaves the base, which is innervated and has a blood supply. Surgical dehorning of adult cattle is very invasive and associated with increased risks of sinusitis, bleeding, prolonged wound healing, and infection, and appropriate pain relief should be used during and after surgery.

Breeding cows to polled (genetically hornless) sires results in polled calves and is strongly encouraged as a means of avoiding the need for disbudding/dehorning. In hot climates, the horns can act as means to dissipate heat and play a role in reducing the effects of heat stress.

Tail docking

It was believed that tail docking dairy cows would improve comfort for milking personnel, enhance udder cleanliness, reduce incidence of mastitis, and improve milk quality and milk hygiene. However, it is well known that tail docking provides no overall advantage in terms of cow cleanliness, udder health, or milk quality. On the contrary, tail docking compromises dairy cattle welfare since it causes acute pain, increases the risk of post-operative infection and chronic pain due to neuromas. Also, tail docked cattle may also experience greater discomfort from flies as they are not able to use the tail to control flies. Trimming the switch can be used instead of tail docking to improve cleanliness and worker comfort, if necessary. Tail docking of dairy cows is prohibited in some countries.

Extra teat removal

Supernumerary teats (also referred to as extra or sprig teats) may be found in heifers as extensions of a primary teat, between the front and rear teats, or behind the rear teats. Supernumerary teats can interfere with milking and create another entry point for bacteria, thereby increasing the risk of infection and mastitis.

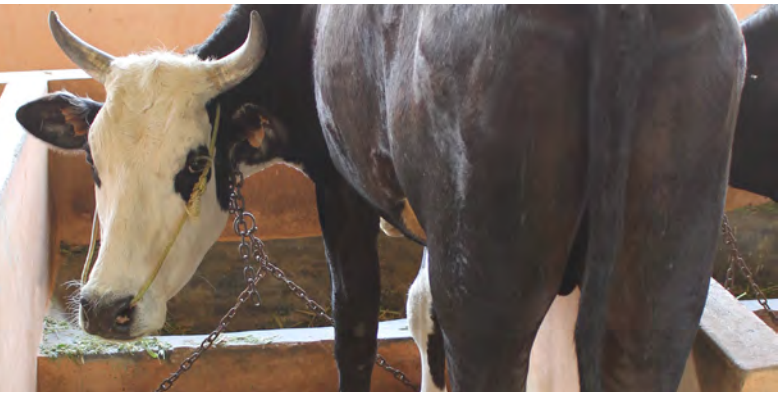
Removing supernumerary teats for purely cosmetic reasons is not ethical or acceptable. If removing extra teats, they must be removed using proper equipment and veterinary techniques, as early as possible, and pain relief should be used during the procedure and for recovery.

Castration

While not a routine practice in the dairy industry, castration may be performed on some farms to prevent unwanted reproduction, reduce aggression towards humans and other cattle, and improve meat quality. All methods of castration cause pain and distress at any age. This response can be reduced by using sedatives, anaesthetics, and analgesics. Animals are easier to handle, heal more quickly, and tend to have a decreased stress response when castrated at a younger age. Preparation of teaser bull through vasectomy for estrus detection dairy animals needs to be done with comprehensive veterinary support and pain relief.

Diseases and other health conditions

Other health conditions that are common in dairy farms and affect their welfare include metabolic disorders (i.e., ketosis, subacute ruminal acidosis, displaced abomasum and 'milk fever'), fertility problems, injuries (skin, hook and tail lesions), parasitism, and complications associated with calving such as dystocia (calving difficulty) and metritis (uterine inflammation). Most of these conditions are multifactorial and can be triggered by many causes. Infectious disease are important and common concerns, with the risks and types of disease being dependent on a combination of geographical region and breed; for example European genetics are more vulnerable to infectious disease in tropical regions than local breeds; foot and mouth disease is an important regional disease but absent in other regions. Improving the general health and welfare of the herd will consequently reduce incidence of diseases and health conditions. Some of these conditions are associated with poor quality housing, management and feeding practices and thus attention to these areas will also improve herd health.



Calf health is a significant, ongoing challenge in many settings, including the issues common to all classes of stock above and common issues for calves like diarrhoea and respiratory. Good management of the health of these vulnerable animals are essential for the welfare of the calf, as well as the future productivity of the animal and the herd. Factors for managing calf health are well documented, and factors contributing to good calf welfare and behaviour are outlined in the sections above.

Dairy herd data keeping (including fertility, birth weight, weaning weight, body condition score, milk yield, etc) will also help to identify possible risk factors related to feeding, management and housing that may be contributing to the prevalence of health problems. More information on data collection for dairy herds can be found here [The Power of Data in Farm Animal Practice].

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