Too Many Lame Cows—How Can You Know? What Can Be Done?

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Abstract

Concern about lameness in dairy cattle has mostly shifted to the herd level. What is the nature and magnitude of lameness issues for a particular herd? Arriving at useful knowledge of herd-level lameness issues requires at least within-herd consistency in recording of data. Benchmarks or goals may readily be set from past performance or from groups of herds using similar recording schemes. Targets for the incidence of specific lesions or diseases have been developed for herds in our practice and could be applied to herds in similar housing and feeding systems. The strategies for detection of lame cows are important. Locomotion scoring in some form is evolving into a standard that is used both to find cows for treatment and to qualify during welfare audits. There are predictable errors in scoring. Regardless of strategy, a shorter interval between detection and action results in a lower prevalence of lame cows. Devote effort to finding and fixing cows that can be helped.

Résumé

Les travaux concernant la boiterie chez les bovins laitiers mettent surtout l'accent sur le troupeau. On cherche à comprendre quelle est la nature et l'ampleur des problèmes de boiterie dans un troupeau particulier. Pour en arriver à une information utile sur les problèmes de boiterie au niveau du troupeau, il faut au moins être constant dans la prise de données au sein d'un troupeau. Des seuils à atteindre ou des buts peuvent être établis à la lumière des performances précédentes ou en utilisant des troupeaux pour lesquels l'entrée de données est similaire. Des cibles pour l'incidence de lésions spécifiques ou de maladies ont été développées pour des troupeaux dans nos pratiques vétérinaires et pourraient être appliquées à des troupeaux qui ont sont logés et nourris de façon similaire. Les stratégies pour la détection des vaches boiteuses sont importantes. L'évaluation de la locomotion, quelle qu'elle soit, est en train d'évoluer vers une forme standard utilisée autant pour détecter les vaches à traiter que pour la vérification du bien-être des animaux. Il existe des erreurs prévisibles dans l'évaluation de la locomotion. Peu importe la stratégie, un plus petit intervalle entre la détection et les traitements à faire permet de réduire la prévalence des vaches boiteuses. Il faut déployer des efforts pour détecter et traiter les vaches qui peuvent être soignées.

Enumerating Lame Cows

Enumerating lame cows sounds easy, but might not be. What is the best definition of a lame cow? I prefer to define lame cows as those that have abnormal locomotion due to a painful condition of the limbs. Cows with other problems, such as peritonitis or meningitis, may have abnormal locomotion. Stifle problems, hock lesions or other upper limb disorders may result in abnormal locomotion and are usually not included in the common concerns about lameness. Most problems resulting in lameness that have some chance of recovery from treatment are in the digits. We could dither over infected hocks or bruised carpi, but most lameness treatments are aimed at lesions distal to the dewclaws. Can we count treatments to enumerate the incidence of lameness?

Incidence should be easily determined from treatment records for lame cows. Unfortunately, many herds do not readily distinguish between routine trims and treatment for lameness. In some circumstances there are no records kept at all. Professional hoof trimmers usually leave a paper record of their work as part of their routine. This report usually includes treatments because they result in a higher fee than routine trimming. A potential shortcoming of trimmer records is the likelihood of over counting lameness.

Not all visible lesions result in pain, discomfort or abnormal locomotion. This is particularly true for digital dermatitis. In the absence of other data, the use of lameness treatment supplies may be a surrogate for the incidence of lameness. There are other questions about incidence for us to grapple with. Cows that are retreated may be counted twice. Cows that have a white line abscess one month and a sole ulcer the next might be considered a single case. No one has developed commonly accepted rules for including or excluding these events in determining the incidence of lameness. Computerized records usually have the disease events in the current lactation or lactation plus dry period in the active

data file. With all cows that have calved as the denominator (lactating plus dry cows) and either the first treatment for each cow, or all treatments, the proportion affected can be calculated. Published values for incidence of lameness are usually highest from Great Britain at about 60%, with other publications in the range of 5 to 50%. These reports are not uniform in their definition of incidence. In my opinion, the data used for the studies giving low values were probably incomplete. In reviewing some farm records, only cows receiving drug treatments were recorded and in others, only those treated by veterinarians were recorded. At almost any level of lameness incidence, our goal is to reduce the occurrence and thus reduce suffering and financial losses. Within a herd, the recording system employed should probably only be used to evaluate changes in that herd. Attempts at benchmarking or to look across herds or to combine data from several herds, unless collected in identical fashion as by a single hoof trimmer, are probably invalid.

Separating the incidence of lame cows from the prevalence of lame cows in a herd might lead to different conclusions about both the magnitude and the nature of a problem within a herd. Prevalence is very important. It is the current state of the locomotory health of the herd. The prevalence is used for assessing welfare by comparing current conditions to a fixed goal. The New York State Cattle Health Assurance Program states that 85% of cows should have a locomotion score of 1 (based on the Sprecher/Zinpro 1 to 4 scale) to pass. I suggest that this goal will be difficult for most herds to achieve based on the published results of many cross-sectional studies of multiple herds. In a complete herd evaluation that we performed (three experienced locomotion scorers simultaneously but independently scoring all cows as they exited the parlor), the proportion with a score of 1 and 2 was 79% (based on the Guard/Janssen 1 to 5 scale; 407 of 518 cows). In this study, all cows were trimmed in the following two days and 20 of 407 non-lame cows had serious, painful digital lesions. Of 88 cows with a locomotion score of 3, 26 (30%) had a painful digital lesion. For cows with a score of 4, 13 of 21 (62%) and with a score of 5, 2 of 2 (100%) had painful digital lesions. There is always the chance of errors in classification by locomotion scoring or by evaluating the feet when the cow is being trimmed. Nevertheless, the assessment of this herd was that lameness was a minor problem, and yet by locomotion score it would not have passed the New York welfare audit. Cows that walk normally have serious lesions, and cows that limp may not have detectable lesions.

Our goals in developing locomotion scoring systems have been both to serve as research tools to study the biology of lameness and to aid producers in identifying cows that will benefit from treatment. Imperfection might be corrected by objective, mechanical measures. The only system in commercial application in the US is StepMetrix from Boumatic, Inc. This system was used by the herd described in the previous paragraph and its performance evaluated. The manufacturer recommends a cutoff of 38 in the 1 to 99 machine-generated score for lameness. With this threshold, the sensitivity was 24% and the specificity 94% for detection of cows with painful lesions found at trimming. I do not believe a system that identifies one in four cows with lesions is adequately sensitive for successful management of lame cows.

Prevalence of lameness is greatly affected by the disorders present in the herd and the management approach to their treatment. At one extreme, lame cows could be identified by observation every day and treated the same day. Treatment of some conditions results in return to normal locomotion in a few days, and for others the recovery period may be weeks. If the herd with daily observation and treatment had mostly infectious digital diseases that respond rapidly to treatment the prevalence would be very low. Following are some hypothetical herd scenarios to illustrate the effects of detection and action on apparent prevalence. With a 50% incidence of digital dermatitis and four days of abnormal locomotion (one day before and three days after treatment), there would be 200 lame cow days per year in a 100-cow herd. With a uniform rate of occurrence and treatment, the prevalence of lame cows would 200/365 or 0.5%. At the other extreme of detection and action, for example a hoof trimmer visits every four weeks to treat lame cows, there would be 10 days of abnormal locomotion for every case (an average of 14 days before treatment and three afterwards). The prevalence of lameness would be 850/365 or 2.3%, or five times higher due to delayed treatment. If the detection in a herd is imperfect, as it always will be, the prevalence judged by an outside observer will be higher than either of these simple examples. Additionally, the longer recovery periods of hoof horn lesions, such as white line abscesses and sole ulcers, will add to the prevalence more than a higher incidence of rapidly treated infectious diseases. Sole ulcers require up to two months for healing, and even with hoof blocks cows usually display abnormal locomotion. Consider the situation with an incidence of sole ulcer of 15% and the duration of abnormal walking is two months with immediate treatment. There will be 900 lame-cow days, or a prevalence of 2.5%. Recovery from a minor white line abscess takes about seven days. With daily observation and treatment and an incidence of 15%, there will be 105 lame-cow days or a prevalence of 0.3%. Waiting for the trimmer's monthly visit will increase lame-cow days to 315 and triple the apparent prevalence to 0.9%. Added to all these considerations are the cows with chronic hoof problems that never recover to perfect soundness. Perhaps 3 to 5% of

many herds fall into this category and add to the prevalence, regardless of other detection and intervention activities.

Reducing the Incidence of Lameness

What can be done to reduce the incidence of lameness? The risk factors are well characterized. Infectious disease control requires a combination of hygiene to reduce the infection pressure and preventive foot bathing to control the health of interdigital skin. Hoof horn lesions are reduced by minimizing standing time by providing stall comfort, not overcrowding, separating first from greater parity cows and controlling the daily time budget for milking and management activities. Excessive hoof wear can be reduced by rubber flooring. Feeds and feeding management should be rumen-friendly. The list is simple. Finding the right thing to fix in any given problem herd may be less obvious.

Reducing Prevalence of Lameness

What can be done to reduce the prevalence of lameness? First, reduce incidence of new lameness cases. Second, find and fix lame cows. As with many of the health problems of dairy cattle, the actions of the people responsible for their care have a large impact on the apparent magnitude of problems and on the welfare and financial consequences of abnormal health.

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