Moving away from blanket dry-cow therapy – what about the higher-risk herds?

With fewer than 12 months to go until new European regulations come into force regarding the use of veterinary medicines, Dr Catherine McAloon, UCD and colleagues in the CellCheck Technical Working Group, explore what is involved in the move away from blanket dry-cow therapy and the journey that some of the higher-risk farms will have to take in order to comply

Mastitis remains one of the most important production diseases of dairy cattle. Currently in Ireland, the practice of blanket dry-cow therapy is common. This is where intramammary (IM) antimicrobials (AMs) are given to all cows at drying off in order to treat infected cows, and as prevention against infection over the dry period of uninfected cows. It is this practice of using IM dry cow AMs to prevent new infections in uninfected cows that is the focus of much attention, as Ireland prepares to adopt new EU medicines legislation. This comes into effect in January 2022, whereby routine prophylactic and metaphylactic use of antimicrobials in food-producing animals will not be acceptable and cannot be used as a substitute for good management. As part of a targeted global action plan on reducing the threat of antimicrobial resistance, using antimicrobials on a 'just-in-case basis' is no longer deemed acceptable both at a societal and a legislative level. In addition, the new legislation will bring changes around acquisition and availability of some types of antimicrobials for use in food-producing animals. Further details about choices of AMs used for IM therapy, as per the new European Medicines Agency (EMA) guidelines, can be found in the CellCheck document, *Responsible Antibiotic Use in Mastitis Control* document found here: https://animalhealthireland.ie/wp-content/uploads/2020/10/Responsible-Antibiotic-use-in-Mastitis-Control-2020-FINAL.pdf

IDENTIFYING INFECTION

The discussion about moving away from blanket dry-cow therapy is commonplace nowadays. It is important to understand the alternatives, and how we define them. Internationally, the term selective dry-cow therapy (SDCT) is commonly used, whereby only animals with evidence of infection at drying off receive an IM AM. Our national mastitis control programme coordinated and facilitated by Animal Health Ireland, CellCheck, refers to a 'selective drying off strategy' whereby the focus is on cows that have no evidence or history of infection and, therefore, could receive teat sealer only at drying off, with the remainder of the herd receiving an IM AM as well as a teat sealer. This perspective was proposed as we are starting from a place where blanket dry-cow therapy has been the norm for most herds.

Ultimately, drying off cows without antimicrobial and using a teat sealer only or, perhaps, nothing at all, is lower risk in some herds than others. Leaving aside for a moment the necessary infrastructure for a relatively safe dry period without IM AM and the techniques and hygiene required to administer teat seal only at drying off, a key challenge is to make sure any cow that is infected at the time of dry off receives AM and gets the best chance to cure. However, accurately identifying the cow's infection status becomes more complicated in herds with poor control of somatic cell count (SCC). The negative predictive value of a SCC threshold differs substantially with the prevalence of mastitis in the herd. Preliminary analysis of UK data has shown that with traditional simplistic SCC cut-offs, we are missing the opportunity to treat infection 48% of the time in high-prevalence herds versus 4% of the time in low-prevalence herds. The impact of this could include reduced animal welfare or impaired herd level mastitis control. It is a much easier discussion to advise on cows eligible for AM treatment or teat seal only in herds currently classed as low risk, ie. those with excellent control of SCC and milk quality. However, currently approximately 30% of herds nationally have an average bulk tank somatic cell count (BMSCC) >200,000 cells/ml and, thus, are considered 'high' risk. Set this against a backdrop of looming legislative change banning blanket dry-cow therapy and necessitating a move to SDCT for all herds, we, as an industry, urgently need to engage with these high-risk herds and address milk quality issues in order to move them to a lower risk status and ultimately to move them safely to SDCT. This is a much more difficult discussion.

CULTURE CHANGE

There are many herds with good control of mastitis, and sufficient individual cow information, that could safely move to SDCT, according to current CellCheck guidelines (available here: https://animalhealthireland.ie/wp-content/uploads/2019/08/CellCheck-Dry-Cow-Strategy-July-2019.pdf). This should be encouraged with appropriate veterinary

oversight, along with the need to understand the necessity for hygiene at drying off, with particular focus on the practice of using teat sealer only. There may be a need for different criteria rather than a standard 'one size fits all' for selecting cows for sealer only in different scenarios, depending on the vet's clinical judgement, and bespoke knowledge of the farm management. Criteria for classification as 'low risk' include: herds with a BMSCC <200,000 cells/ml consistently; at least four milk recordings per cow in a year; a low recent infection rate; a low dry period new infection rate; excellent standards of hygiene; and those who willingly engage with suitable veterinary advice around dry-cow treatment. Within those low-risk herds, cows who had an SCC consistently below 100,000 cells/ml across the lactation and no history of clinical mastitis during the lactation and good teat skin health can be recommended to receive teat sealant only at drying off, provided it is administered cleanly. There are many resources available, from CellCheck, Teagasc and the co-ops, to provide tips for the drying off procedure, such as a suggested maximum number of cows to dry off in a day, and the equipment and personnel needed etc. (see https://online.flippingbook.com/view/821915/24/).

The more difficult issue is the herds that do not meet the criteria for safely moving to a selective drying-off strategy just now. Of course, any major change in management is not without risk across the board for all herds. The potential for problems will always exist, but ultimately all herds will be obliged to address the issue of preventative use of AMs, and those with good control of clinical and subclinical mastitis will certainly have a better chance of success. We have used blanket dry-cow therapy for years and, yet, still have almost one third of herds with 'poor' mastitis control. Delivering change in these herds will not be easy, but the new legislative framework, will expedite an important culture change in accepted standards of milk quality. It is important to remember that accepted standards of milk quality internationally are usually much lower than any minimum legal standard. In other words, a BMSCC <200,000 cells/ml is considered an indicator of good milk quality, and not just the minimum legal requirement of 400,000 cells/ml that is outlined in EU law for condition of supply. In no other herd-health problem is the minimum legal threshold a target for success and mastitis control should be no different. Despite years of research and proven methods of control, mastitis remains a challenging issue to address in herds with serious problems, primarily due to management issues and a reluctance or lack of motivation to change. Regardless of legislation on AM usage, high SCC is a source of significant economic loss to dairy herds and should be a motivation for farmers to seek help in tackling this issue on their farms.

HOW CAN WE SUPPORT THESE HIGHER-RISK HERDS?

We have a short window in which the issues with mastitis must be addressed to enable these herds to remain compliant with the new legislation and to reduce AMs safely. Data analysis will be key to helping control mastitis in high SCC herds, as well as providing some evidence or basis on which to adopt SDCT. Harsh as it may seem, herds without milk recording data will be difficult to help. There can be no excuse for not milk recording – it is a decision-making necessity, not a luxury. Problem herds that are currently not milk recording must begin immediately.

THERE ARE A FEW KEY AREAS TO CONSIDER

How is the dry period performance? Can the farm calve down uninfected cows?

If our aim with SDCT is to avoid giving IM AM at drying off to uninfected cows, the key criteria on which success or failure hinges are:

- That the cow was in fact uninfected at the point of dry off;
- The avoidance of infection during the drying off process; and
- That the cow remains uninfected across her dry period and subsequent calving event.

Achieving all three is no mean feat. It is quite possible that, regardless of the cow's infection status at dry off, she could well acquire a new infection at the point of drying off, particularly if teat sealant is inserted unhygienically. The cow might also acquire a new infection at any point across the dry period or at calving. It is important to assess the previous dry period cure rate, which should be >85%, and dry period new infection rate which should be <10%, now before any changes are embarked upon. Reasons for failures can include chronic infections caused by bacteria such as *Staphylococcus aureus*, where cure rates are regularly poor. Failure to cure over a previous dry period should necessitate culling of these cows. Other reasons for failed dry periods include acquisition of a new infection, perhaps related to drying-off technique, or to the dry period management including housing-related issues and management around calving and the whole periparturient period.

Of course, in order to make these valuable assessments of dry period performance and SDCT decisions, there needs to be milk recording data close enough to dry off. Milk recording data in early lactation (first 60 days in milk), as well as any clinical case of mastitis data, is also essential in order to assess the success or failure of the dry period. Targeting this action and encouraging all dairy farmers to carry out individual cow milk recording on a regular basis and starting in early lactation is the starting point in terms of a move to SDCT. Dry period performance could then be benchmarked and areas for improvement identified, such as cow to cubicle ratio, cubicle management or calving pen management, which are all key risk areas for acquiring a new infection over the dry period.

Is spread of mastitis well controlled during lactation?

While controlling the spread of mastitis is a key component of tackling a mastitis problem, it is essential to first get a handle on the source of the mastitis. For example, chronically infected cows are much more common in high SCC herds, whereas low SCC herds are often prone or susceptible to clinical cases of environmental mastitis. The issue of mastitis spread must then be considered, i.e. is spread happening in the parlour or is it happening from the environment to the cow? These are questions that are fundamental to tackling a subclinical mastitis issue/high SCC. A thorough and structured investigation is necessary to glean this information.

MASTITIS INVESTIGATION

A mastitis investigation should follow a repeatable, systematic method.

a. Pre-visit analysis of milk recording data and use of the CellCheck dashboard, if available

The first step should be to look at milk recording data, or in the absence of data to get regular milk recording up and running. The new CellCheck dashboard, developed in partnership with the Irish Cattle Breeders Federation (ICBF), is now available to CellCheck-trained vets and allows milk recording SCC patterns to be analysed over time and groups, and to be easily summarised. Once data has been assessed then the farm visit can take place. Pre-visit analysis of milk recording data, and preferably also clinical case data, help make those assessments and generate hypotheses that help target the farm visit. For example, looking for temporal trends in BMSCC can help us to understand the epidemiology of the problem, ie. if the issue is ongoing year-round then parlour spread is likely implicated; whereas temporal associations with housing would be more suggestive of a mixed or environmental mastitis component. Looking at the CellCheck Farm Summary Report helps us gain an understanding of the spread of infection by looking at the recent infection rate – a recent infection rate consistently above 7% indicates new infections (spread) are occurring between consecutive milk recordings. A high persistent infection rate with a high proportion of the herd failing to cure is often seen with contagious mastitis problems caused by *S. aureus*. The CellCheck report can reveal the prevalence of infected cows in the herd, ie. the proportion/number of cows with individual SCC >200,000 cells/ml. Epidemiological analysis of all this readily available and easy to understand milk recording data helps the development of a working theory of how the mastitis behaves on the farm.

b. The farm visit

- Observe milking routine thoroughly;
- Teat scoring;
- Listen to machine and assess for obvious faults;
- Pick cows from the problem cow list, use California Mastitis Test to identify problem quarters to take aseptic milk samples for culture and susceptibility testing;
- Ask more detailed questions about areas not available from records, such as about mastitis treatments;
- Look at housing and other environmental factors; and

- Make sure there has been a recent milking machine service-assess the report or consult with a milking machine technician.

Looking at milking routine can help us develop a deeper understanding of mastitis on the farm and is particularly important when faced with contagious mastitis problems. The standard and consistency of the milking routine compared to best practice can be assessed. Additionally, common deficiencies in milking routine can be looked for involving milker hygiene, teat condition and preparation, cluster attachment and removal, post-milking teat disinfection including product type and coverage. Other things to look for include evidence of overmilking or undermilking, assessment of teat condition through teat scoring (recommended target is <20% teats scoring rough or very rough) and hygiene scoring.

The milking machine should be visually inspected at any mastitis investigation and the frequency of rubberware changes checked. The milking machine should be fully serviced at least annually. As part of any mastitis investigation, these reports should be carefully inspected – engagement with a milking machine technician is recommended, so get to know those working in your area.

Milk culture results are very important in understanding a high SCC problem. In most chronically infected high SCC herds, the likelihood that *S. aureus* is involved is high, but confirmation is required as other causes of mastitis may also be involved. Samples with a result of mixed growth generally indicate contamination during sampling, and therefore need to be repeated to be diagnostic. Of course, decision making on which cows to sample should not be based on just the first few cows on the problem cow list, but rather a combination of recent and chronic high SCC cows (or all ages) as well as clinical case samples from across the year. Culture and susceptibility of sterile milk samples will be very important to comply with the EMA guidelines around AM selection on farms.

c. Results and interpretation

1. Once milk culture and other results are available, hypotheses about the main source of infection and risk factors for spread of mastitis need to be developed in order to prioritise recommendations to address these issues. A timeline should be provided with small changes each month. A detailed plan for follow up should also be included – such as once-a-month by phone or perhaps visits quarterly.
2. Recommendations that tackle the source of infection often include a combination of early dry off, dry off at quarter level, culling and change of treatment at drying off. Chronic mastitis may not cure across a dry period and is certainly unlikely to cure during lactation even if treated. Recommendations that tackle the spread of contagious mastitis are usually targeted at the milking routine. Of course, if the issue is more environmental, then management outside the parlour will be prioritised.

COMMUNICATION

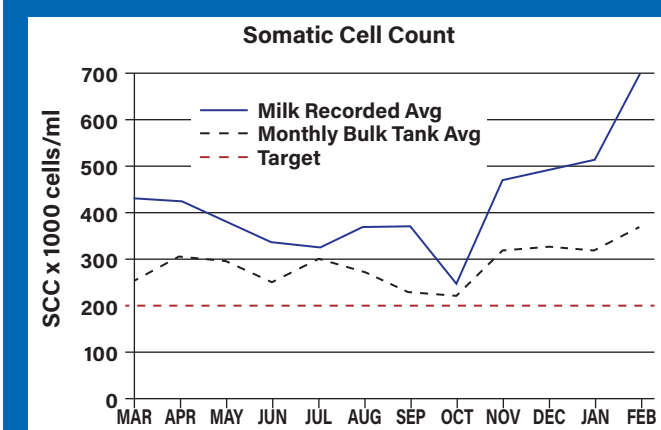
Despite an abundance of agricultural resources from Teagasc advisers, co-op milk advisers, and vets all being available to farmers, we still have a significant issue, with up to one third of herds being classed as having poor control of SCC. Getting farmer engagement and willingness to change are crucial to dealing with SCC problems in these problem herds. Successful communication and motivation to change are important to succeed in overcoming these milk quality problems. Targeted messages, perhaps focusing on one or two important control aspects per month, with ongoing sustained follow up, will likely prove more successful than isolated investigations several months apart with many recommendations. Tackling the problem-cow list on a monthly basis and using widely accepted techniques such as motivational interviewing can drive and deliver change in what can be problems that have been rooted in farms for years. Change is possible only if the those involved in carrying out the milking and making management decisions are brought on board. The traditional approach using the 'righting reflex' has proven to be ineffective in gaining farmer engagement and, therefore, it has never been more important to adopt newer communication skills to help deliver change.

As vets, we will be faced with a prescribing dilemma where, even if the bulk tank is 400,000 cells/ml and there are cows with individual SCCs of 50,000, or 70,000 or 100,000 cells/ml, we will not be able to give those likely uninfected cows, even in 'high-risk' herds, IM AMs at dry off indefinitely. Although the need for blanket dry-cow therapy may be required in certain herds at certain times, it will not be sustainable in the same herds year-on-year to compensate for poor management. It will be by no means easy to address these herds and engage with them, but change is possible, and we must start now.

HERD EXAMPLE

Herd history

- 150-cow herd.
- Herd average SCC as per milk recording >700 000 cells/ml.
- There is a prolonged history of high SCC – bulk tank SCC seemingly never below 200,000 but rarely above 400,000 as the farmer seeks to keep known high SCC cows out of the bulk tank where possible.
- No seasonal pattern in high SCC is reported and the problem appears to be there most of the time.
- Clinical cases of mastitis are not recorded formally but the farmer reports he estimates it is fewer than 30 cases per 100 cows per year, and is not the main feature of the mastitis problem.
- Penalties being paid for high average bulk tank cell count.



SELEKT®

Make your clients smile
SELEKT the best

Whelehan ANIMAL HEALTH

Contact Whelehan Animal Health on telephone **(01) 4688900**
Call Colm Menton on **087 2545989**
Send an email to **ColmM@tpwhelehan.ie**

SUMMARY OF CELLCHECK FARM SUMMARY REPORT

- No temporal trend – serious issue with BMSCC over whole year suggests parlour spread.
- Recent infection rate is 18% (target <7%) – ongoing spread, and new infections month on month).
- Persistent infection rate of 30% (target <8%) at last milk recording (lots of chronic infections).
- Cure rate over the dry period was 65% (target is >85%) – lots of chronic cows with high SCC one lactation and high SCC again the following year ie. failed dry periods/failure to cure.

RISK FACTORS IDENTIFIED AT VISIT

- No segregation – cows with SCC of >1 million cells/ml on last milk recording do not go into bulk tank but are milked in the middle of other cows.
- Deficiencies in milking routine such as:
  - I. No gloves;
  - II. Little/poor teat preparation – teats are dirty, sometimes paper towel used to wipe, sometimes not, it is not changed between cows either, teats are not stripped or palpated;
  - III. No automatic cluster removal – some overmilking present, lots of teat-end damage;
  - IIII. No cluster cleaning, peracetic acid in buckets used to dip clusters after very high SCC cows milked (>1million cells/ml) but not changed during milking; and
  - V. Poor post-milking teat disinfection – poor coverage of teats and poor quality product used.
- Lack of culling, lack of addressing the problem-cow list.
- Milking machine not serviced and liners not changed regularly enough.
- Varying dry period lengths often with short dry periods.
- 20 cows California mastitis tested and sampled for milk culture; 12 cases of *S. aureus* were identified.

SOURCE

- Chronic high SCC cows.
- Poor DCT and many failed dry periods.
- Lack of culling.
- Not addressing problem cows.

SPREAD

- Milking parlour issues.
- Routine haphazard at identifying cases.
- No proper segregation.
- Overmilking.
- Potential worn liners.
- Inadequate post-milking teat disinfection.

RECOMMENDATIONS – SHORT-TERM

- Cull or dry off cows/quarters – given selected list after each milk recording.
- Segregate based on 200,000 SCC.
- Wear gloves and increase hygiene awareness, edit routine.
- Increase teat dip use and use an effective product such as a Chlorhexidine-based product.

RECOMMENDATIONS – LONG-TERM

- Cull chronic SCC cows to ease infectious pressure.
- Liner changes and machine services at appropriate time intervals.
- Implement meaningful segregation so infected cows are milked last, or instal cluster-cleanse system or institute proper cluster dipping.
- Ensure eight-week dry period with use of effective antibiotic for *S. aureus* problem and use teat seals also.
- Monitor with monthly milk recordings.

ACKNOWLEDGEMENT

Sincere thanks to CellCheck Technical Working Group members: Finola McCoy, Michelle McGrath, Eoin Ryan, Luke O'Grady and Frank O'Sullivan for input in the development of this article.

References available on request

READER QUESTIONS AND ANSWERS

1. WHAT IS THE TARGET THAT SHOULD NOT BE EXCEEDED IN RECENT INFECTION RATE ON THE CELLCHECK REPORT?

A. <10%
B. <20%
C. <7%
D. <12%

2. WHAT PERCENTAGE OF TEATS WHEN TEAT SCORED AS ROUGH OR VERY ROUGH COULD INDICATE A PROBLEM WITH TEAT END DAMAGE?

A. 10%
B. 20%
C. 30%
D. 40%

3. WHAT IS THE TARGET DRY PERIOD CURE RATE?

A. 60%
B. 70%
C. 75%
D. >85%

ANSWERS: 1C; 2B; 3D.