Rule changes to antibiotic use on dairy farms are coming

ARE YOU READY?

- PRACTICAL DEMONSTRATIONS - HOW BEST TO DRY OFF COWS?
- IRISH RESEARCH ON SELECTIVE DRY COW STRATEGIES
- ANTIBIOTICS – WHAT DOES THE FUTURE HOLD?
- SELECTIVE DRY COW STRATEGY – THIS FARM’S EXPERIENCE
- APPLYING FOR A FREE ‘DRY COW CONSULT’

This series of CellCheck events is being run with the help and support of the local Co-op in each region.
FREE DRY COW CONSULT

Are you milk recording?

Is your bulk tank SCC consistently below 200,000 cells/mL?

Are you ready to reduce antibiotic use at drying off?

If so, then your herd may be suitable for a selective dry cow therapy strategy this winter. With the right hygiene, management and support, many herds are successfully reducing their antibiotic use at drying off, by developing selective dry cow strategies in consultation with their veterinary practitioners. A free Dry Cow Consult is available again this year for eligible herds, delivered through the Targeted Advisory Service on Animal Health, funded by the Rural Development Programme and coordinated by Animal Health Ireland.

This 3-hour consultation is carried out with your selected trained veterinary practitioner and is an opportunity to assess the current drying off process and dry period performance and identify additional gains that can be made. Milk recording results and farm records will also be analysed to identify individual animals that may be suitable for a ‘non-antibiotic’ dry off, and the best way of implementing this.

It is important to remember that a selective dry cow strategy is not without risk and is not something to embark on without seeking professional support and advice.

INFORMATION/APPLICATION

For more information, and to submit an application for a Dry Cow Consult, see

www.animalhealthireland.ie

AHI office on 071 9671928
INTRODUCTION

In this article we ask and answer some key questions around antibiotic resistance; what is antibiotic resistance, and why are we so concerned about it recently? What role does antibiotic use on farm play in its development, and how can those of us working in the dairy sector positively influence this? When drying off cows, has a selective dry cow strategy a role to play in reducing the use of antibiotics on farm? What science is available to help choose which herds are suitable for selective dry cow strategies, and how do we best identify the cows in these herds that may not need antibiotics at drying off, while still protecting the udder health of the herd?

This article looks at these areas, drawing on national and international research to answer some of these questions, while also highlighting that there are still some questions to which we don’t have all the answers.

WHAT IS ANTIBIOTIC RESISTANCE?

Antimicrobial resistance (AMR), or antibiotic resistance as it is commonly referred to arises when the bacteria which cause infection survive exposure to an antibiotic that would normally kill them or stop their growth. AMR allows strains of bacteria that are capable of surviving exposure to a particular antibiotic, to grow and spread. In addition, resistance to one or more antibiotics may occur and this is a real threat to our planet especially when we only have a limited number of antibiotic groups to treat infections in humans and animals.

We can grow bacteria on an ‘agar plate’ and use different antibiotic discs to check which antibiotic works best. Where there is a zone of ‘no growth’ around the disc...
we know the antibiotic works. Where there is bacterial growth around the disc, then the bacteria is resistant to that antibiotic.

Not only do we see bacterial infections on farms that are difficult to treat because of resistance, but we also encounter human infections resistant to antibiotic treatment. Worse still, bacteria that are resistant may spread and share these traits with other bacteria including those in the environment, eventually tracking back to the bacteria that cause infections in humans. The pace at which AMR has been developing in more recent years has increased, and it is now recognised as being a significant threat to human health. See Figure 1.

**Figure 1.** Potential routes of transmission of antimicrobial-resistant bacteria via the food chain (ESFA, 2008)
THE IMPORTANCE OF ANTIBIOTICS IN HUMAN AND ANIMAL HEALTH

AMR is responsible for an estimated 25,000 deaths and €1.5 billion in extra healthcare costs every year in the EU alone. Hence the sense of urgency about addressing this issue and doing so at a global level.

AMR is linked to antibiotic use – increased antibiotic use in both humans and animals is associated with an increase in AMR. In relation to mastitis-causing pathogens, there is evidence to show that different bacterial species develop resistance to different antibiotic groups at different rates.

Currently, antibiotics are used by doctors to treat sick people, and in the agricultural sector to treat animals. In recent years, there has been increasing recognition of the linkage between AMR in people and antibiotic use in animals. For these reasons, there is increasing scrutiny of the use of antibiotics in the agricultural sector. There is agreement on the importance of antibiotics to treat sick animals. However, it is no longer considered acceptable that antibiotics should be used to prevent disease, particularly when there are other proven strategies. The type of antibiotic used for treatment of animals is also an important consideration. ‘Highest Priority Critically Important Antibiotics’ (HP-CIAs) need to be preserved for human use. DAFM recently published guidelines on the use of CIAs in animals (Table 1). Disease prevention and improved herd health certainly helps reduce the need for antibiotic on farm. Vets and farmers need to be mindful to avoid using those antibiotics that are classified as HP-CIAs.

<table>
<thead>
<tr>
<th>Antimicrobial Class</th>
<th>Active Substance</th>
<th>Examples Of Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd &amp; 4th generation</td>
<td>cefovecin</td>
<td>Convenia</td>
</tr>
<tr>
<td>cephalosporins (HP-CIA</td>
<td>ceftiofur</td>
<td>Alfacef, Cefavex, Cefinil, Cefokel, Cefiocl, Cemay,</td>
</tr>
<tr>
<td>Category 2)</td>
<td>cefquinome</td>
<td>Cevaxel, Curacef, Eficur, Excenel, Naxcel</td>
</tr>
<tr>
<td>Fluoroquinolones (HP-CIA</td>
<td>enrofloxacin</td>
<td>Baytril, Doraflox, Enroban, Enrocure, Enrodesil,</td>
</tr>
<tr>
<td>Category 2)</td>
<td>marbofloxacin</td>
<td>Enrofloxacin Krka, Enro-K Aurizon, Boflox, Efex,</td>
</tr>
<tr>
<td>Polymixins (HP-CIA Category</td>
<td>pradofloxacin</td>
<td>Forcyl, Kelacyl, Marbim, Marbocare, Marbocyl</td>
</tr>
<tr>
<td>3rd &amp; 4th generation</td>
<td>Colistin</td>
<td>Colfive, Coliscour, Colistin APSA, Hydrocol, Sogecoli</td>
</tr>
<tr>
<td>cephalosporins (HP-CIA</td>
<td>erythromycin</td>
<td>Erythrocin</td>
</tr>
<tr>
<td>Category 2)</td>
<td>gamithromycin</td>
<td>Zactran</td>
</tr>
<tr>
<td>Macrolides (HP-CIA Category 1)</td>
<td>tildipirosin</td>
<td>Zuprevo</td>
</tr>
<tr>
<td></td>
<td>tilmicosin</td>
<td>Hymatil, Micotil, Milbotyl, Pulmotil, Pulmocyt,</td>
</tr>
<tr>
<td></td>
<td>tilmicosin</td>
<td>Tilmov, Tilmovet</td>
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<td>Draxxin</td>
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<td></td>
<td>tylosin</td>
<td>Bilosin, Bilovet, Pharmasin, Tylan, Tylo, Tylodon,</td>
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<td></td>
<td>tylosin</td>
<td>Tylot, Tylucyl</td>
</tr>
<tr>
<td></td>
<td>tylosin</td>
<td>Aivlosin</td>
</tr>
</tbody>
</table>

Table 1. Highest Priority Critically Important Antimicrobials licensed and sold in 2016 in Ireland
ANTIBIOTIC USAGE ON THEIR FARM?
The focus of the CellCheck programme is on improving herd and udder health, thereby minimising clinical and subclinical disease. This also reduces the need for mastitis treatments, both injectable and intramammary.

THE ROLE OF ANTIBIOTIC DRY COW THERAPY
The practice of dry cow therapy is being questioned in many countries, by farmers, consumers and society in general. Antibiotic dry cow therapy undoubtedly has an important role to play in treating infections that persist at the end of lactation and maximising cure rates. It has also traditionally been used to prevent new infections occurring over the dry period. While the dry period is a high risk period for udder infections both clinical and subclinical, the consumer at home and abroad is becoming intolerant of using antibiotics on a ‘just in case’ basis. Considering our changing attitude and approach towards the use of antibiotics in a ‘preventative’ fashion, do we also need to rethink how and why we use dry cow therapy? And in fact, how do we define dry cow ‘therapy’?
Recent analysis of sales data in Ireland (More et al., 2017) indicated that sales of dry cow intramammary antibiotics were sufficient to treat 100% of the national milking herd i.e. all quarters of all cows are being treated at the end of lactation. This is what is referred to as ‘blanket dry cow therapy’, which until recently was recognised as best practice in mastitis control and has made a very positive contribution to udder health in many countries. However, as we learn more about AMR and what drives it, we need to review what is considered best practice, as well as the implications of modifying those ‘traditional’ recommendations. Change is not without risk.

WHAT ARE THE RISKS AND BENEFITS OF MOVING AWAY FROM BLANKET DRY COW THERAPY?

An alternative to blanket dry cow therapy is a ‘selective dry cow strategy’. A selective dry cow strategy involves administering internal teat sealant only to a selected proportion of suitable cows at drying off, with the remainder of the cows receiving both an antibiotic tube and an internal teat sealant. While this is considered a more prudent use of antibiotic and would reduce antibiotic use on many farms, we need to bear in mind that this practice is not without risk. So how can we manage this risk? The CellCheck Technical Working Group recently reviewed all of the science and research on dry cow therapy published since early 2000’s, and have identified the following key risks:

1. Hygiene at drying off: The first risk is of introducing bacteria when we infuse any intramammary tube into a quarter. When we use internal teat seal only, there is no antibiotic present as “backup” and so the potential consequences are even greater. These ‘introduced’ bacteria can cause severe cases of mastitis, sometimes resulting in death, early in the dry period. In addition, many of the cases of mastitis in early lactation have been shown to have a dry period origin. Hygiene standards and practices at drying off – as outlined in detail in the CellCheck Farm Guidelines (pages 117-119) – are essential to protect the udder health of the uninfected cow. Hygiene and management of the dry cow environment is also crucial.

2. The second risk is of missing the opportunity to cure quarters that were infected at the point of drying off, to maximise cure rates before the next lactation starts. A very common question is “how do I know which ones are the infected animals”? There are many criteria that need be considered when making these decisions, including milk recording results and milk culture results. Even with all this information on hand, further questions
remain such as “How many milk recording results do I need to have and how close to drying off do they need to be?” and “At what cow SCC level should I consider using antibiotic dry cow therapy”? The reality is that there are still many unknowns, and not all of these key questions can yet be answered. Everyone agrees about the key role of milk recording in helping with this decision. At this point however, different countries have adopted different herd and cow-level thresholds for deciding to treat with antibiotics at drying off. This highlights that there isn’t one, simple answer to this question. Future research, both Irish and international, should help answer some of these questions, direct good and appropriate decision-making and help us to predict the outcomes and manage some of the risks involved.

IS A SELECTIVE DRY COW STRATEGY SUITABLE FOR MY HERD?

All decisions around dry cow therapy should be made in consultation with a veterinary practitioner who has knowledge of the herd, its history and environment. Antibiotics used at drying off are subject to Irish and EU regulatory and prescription control. Currently the CellCheck Farm Guidelines for Mastitis Control, including Management Note C, outline some of the essential herd and cow-level information that must be available in order to safely consider adopting a selective dry cow strategy.

A selective dry cow strategy may be considered in herds:

1. Where there is good evidence of a low prevalence of infection, for example a bulk milk SCC consistently below 200,000 cells/mL, a dry period new infection rate of less than 10% etc., and
2. Where good practices and high levels of hygiene can be achieved at drying off, throughout the dry period and at calving, and
3. Where regular milk recording is carried out, with at least one recording in the last month prior to drying off, and
4. Where the herd keeper is willing to engage with their veterinary practitioner in decision-making around their dry cow treatment programme.

Within these herds:

- Cows with an SCC consistently below 100,000 cells/mL throughout the lactation and with no history of clinical mastitis may be considered suitable for internal teat sealant only at drying off, provided high levels of hygiene can be achieved during administration.
• In all other cows, the TWG recommends using an internal teat sealant as well as an antibiotic tube.

Who wins/loses from an effective selective dry cow strategy?

• The farmer wins…. because less antibiotics are used on the farm. A selective strategy is likely to be cost saving and economically beneficial. Also there is less chance that antibiotic milk is fed to young calves and a reduced risk of a milk residue failure. The farmer also gets the opportunity to contribute to global AMR reduction.

• The consumer wins…. because of a reduced opportunity for AMR via food or in the environment.

• The processor wins…. because of higher quality milk and therefore key market access with high value dairy products (baby milk formula, yoghurts, cheeses etc).

• The bacteria lose…. because when infections arise in animals and humans, antibiotics are more likely to be effective and kill the bacteria.

All decisions around dry cow therapy should be made in consultation with a veterinary practitioner who has knowledge of the herd, its history and environment. Over time, as more research and technologies become available, these decision-making thresholds and recommendations may change, reflecting changes in our ability to predict infection and treatment outcomes. However, the fundamental requirements of good quality information, excellent hygiene and risk management will never change.

References:


• https://amr-review.org

• https://ecdc.europa.eu

• CellCheck Farm Guidelines for Mastitis Control
One important aspect of the dry period is Dry-Cow Therapy (DCT). This is the treatment of cows at the end of lactation with a long acting antibiotic and/or an internal teat sealer. Using DCT is one of the components of an effective mastitis control programme.

The purpose of DCT is to:

• Treat any intra-mammary infections;

• Protect against new infections during the dry period.

The DCT product used on your farm will depend on what bacterial challenges you have had during the year and a discussion with your veterinary practitioner is key when deciding what product to use.

The steps taken by farmers when drying-off cows can have a significant impact on mastitis levels during the dry period and also during the following lactation. It’s critical that the procedure is carried out correctly. It is also essential that farmers prepare by allowing adequate time and labour when administering dry-cow products to their herd and that staff are adequately trained.
ITEMS REQUIRED
✓ Marker, ankle strap or tail tape.
✓ Milking apron/parlour suit and disposable nitrile gloves.
✓ Methylated/surgical spirits and cotton wool or disinfecting wipes.
✓ Dry-cow intra-mammary tubes - antibiotic and/or teat sealant.
✓ Head flash lamp.
✓ Record book/Animal Remedies Record.

METHOD | STEPS 1-8
1. Wear milking apron/parlour suit and nitrile disposable gloves.
2. Identify the cow and clearly mark with an ankle strap, tail tape or marker.
3. Milk out the cow completely.
4. Ensure that teats are clean and dry.
5. Completely disinfect the teat ends thoroughly with cotton wool and methylated/surgical spirits by vigorously rubbing the teat end opening for a minimum of 10 seconds. This step is critical.
6. Disinfect the teats furthest away first followed by the teats nearest to you to prevent re-contamination.
7. Check the teat wipe – if there is a dirty colour, repeat the scrub using a new cotton ball until it is clear.
8. Treat the teats nearest you first followed by the more distant teats to prevent re-contaminating the teats.
OPPORTUNITIES FOR MASTITIS CONTROL IN THE DRY PERIOD

METHOD | STEPS 9-14

9. Keep the nozzle of the tube sterile to prevent introducing new infections into the teats and udder.

10. Insert the tip of the nozzle into the teat opening and squeeze the contents gently into the quarter - it is not necessary or recommended to insert the tube nozzle to its full depth as this may damage the teat end.

11. When the tube is emptied into the teat, massage the antibiotic up into the quarter.

12. Thoroughly spray or dip the teats with teat disinfectant after treatment.

13. Record the antibiotic used.

14. Make note of the following:
   - Cow number
   - Date
   - Product used
   - Withholding period.

If teat sealer is being used in addition to the antibiotic, follow the same protocol as above except the teat sealer is not massaged into the quarter. Before squeezing the contents of the tube of sealer into the teat, use your free hand to close off the base of the teat, where it joins the udder. The teat sealer is then left in the teat. This acts as a physical barrier to bacterial infection of the cows teats and provides extra protection towards the end of the dry period and especially around calving time. The biggest risks of infection during the dry-cow period are at the beginning and the end of the dry-cow period.
GENERAL POINTS AROUND DRYING-OFF

- Ensure cows’ tails are clipped prior to drying-off.
- Dry-off cows as soon as their production reaches 9 litres per day.
- The use of a head flash lamp can increase the visibility when drying-off cows.
- Dry-off cows abruptly – do not skip days and preferably do not skip milkings.
- Keep the number of cows to be treated to a manageable number i.e. 20 per person per day if using antibiotic only and 10 per person per day if using antibiotic and teat sealer.
- If using teat sealer only on a portion of the herd, dry these off in a separate batch from cows getting antibiotic or antibiotics and teat sealer.
- Ensure cows remain standing for the first 2 hours after DCT so as to allow sufficient time for the teat canal to close.
- Ideally, cows that have been treated with DCT should be kept away from the sound of the milking machine to avoid the stimulus to let milk down.
- Put cows in clean areas after treatment and maintain a clean environment during the dry-cow period to avoid picking up new infections.
- Do not use antibiotic DCT on cows that are going to be culled within the next 2-3 months to avoid unacceptable meat residues.
- Don’t use DCT on quarters that were dried off during the previous lactation.
- Observe cows on a daily basis during the dry-cow period for signs of mastitis.
- Check each cow that received antibiotic DCT has passed her minimum dry period when she calves, and withhold milk from the bulk tank for the period specified by the product.
- Withhold milk from all cows from the bulk tank for at least 8 milkings after calving to ensure that no colostrum or transition milk goes into the tank. This also prevents teat seal residues from entering the bulk tank.
MANAGEMENT AFTER DRYING OFF

Put cows in a clean dry paddock (no bare ground) for 3-4 days after drying off. The paddock should be well away from the milking herd and the milking area, so cows don’t have the stimulus to let milk down.

Later on in the season, cows will be housed directly after drying off. Ensure that cows have direct access to clean dry cubicles immediately after you administer their treatment. This house should ideally be well away from the milking herd and the milking area, so cows don’t have the stimulus to let down milk. Maintain the cubicles in a clean hygienic manner throughout the dry period. It is important to allow access to water at all times. Keep cows on a maintenance diet for a week or so after drying off to reduce the risk of ‘bagging up’.

Mastitis in dry cows is most often caused by bacteria that have gained access to the udder through the teat canal. These bacteria may be found in the cow’s environment i.e. soil, manure, bedding etc. bacteria such as *E. coli* and *Strep. Uberis*, which survive in the cow’s environment, can cause severe cases of mastitis. Anything that will reduce the numbers of bacteria in the cow’s environment or minimise the exposure of teats to these bacteria will reduce the risk of mastitis.

Keep housing clean to reduce bacterial challenge at the teat end

- Scrape passageways, cubicles and collecting yards at least twice a day if manual – automatic scrapers should be run more frequently i.e. every 3-4 hours.
- Cubicle mats can be used on their own or in conjunction with a bedding material such as straw, sand, sawdust, shavings, shredded paper and ground limestone all of which can be successfully used for bedding. The important thing is to keep cubicles and any bedding clean and dry.
- Make sure housing is dry as it is more difficult for bacteria to survive and multiply under dry conditions.
- Make sure housing is well ventilated- the presence of cobwebs can indicate poor ventilation.
- Liming of cubicles regularly (twice daily) will help to keep them dry.
If cubicles are comfortable, cows will use them more often and udders and teats will stay cleaner

- Cubicle bedding should provide comfort, and be fresh and clean.
- Ensure you have enough cubicles – the minimum is one cubicle per cow. If cubicle usage is poor, seek advice, and critically assess the current design and dimension and make appropriate changes. Properly sized cubicles are important for cow comfort.

Further information on DCT is available in *CellCheck Farm Guidelines for Mastitis Control*
Milk recording is an absolutely vital part of ensuring that cows are successfully dried off. Two reports – the Milk Recording SCC Report and the early spring CellCheck Farm Summary Reports are key to monitoring and evaluating the drying off decisions and procedures. Recording how cows are dried off supports the evaluation process.

At last year’s CellCheck Dry Cow Events, the following flow chart (Figure 2) was presented to help you decide on the best dry-cow treatment strategy for your herd.

### Choosing a strategy for dry-cow treatment

<table>
<thead>
<tr>
<th>Do you have enough information to make individual cow decisions?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum requirements:</td>
</tr>
<tr>
<td>• Clinical case records and</td>
</tr>
<tr>
<td>• At least three milk recordings for each cow</td>
</tr>
<tr>
<td><strong>YES</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is mastitis under control in your herd?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your herd have all of the following?</td>
</tr>
<tr>
<td>• A herd SCC &lt;200,000 cells/ml</td>
</tr>
<tr>
<td>• &lt; 5 % new / recent infection</td>
</tr>
<tr>
<td>• &lt; 2% clinical case rate in the last 3 months</td>
</tr>
<tr>
<td><strong>YES</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blanket Dry-Cow Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use antibiotic dry-cow treatment on every cow</td>
</tr>
<tr>
<td>2. Consider the use of teat seals</td>
</tr>
<tr>
<td><strong>NO</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Selective Dry-Cow Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use teat sealer alone for cows with:</td>
</tr>
<tr>
<td>• SCC consistently &lt;100,000 cells/mL and</td>
</tr>
<tr>
<td>• No clinical cases of mastitis this lactation</td>
</tr>
<tr>
<td>Consider checking cows using a CMT</td>
</tr>
<tr>
<td><strong>YES</strong></td>
</tr>
</tbody>
</table>

| Use antibiotic dry-cow treatment for cows with:               |
| • SCC >100,000 cells/mL on any milk recording this lactation  |
| • Any number of clinical cases of mastitis this lactation     |
| Also consider the use of teat seals                           |
| **NO**                                                        |

**Figure 2.** Flow chart to determine the best dry-cow treatment strategy for your herd.
The chart showed that the records generated through milk recording were essential for those considering a Selective Dry Cow Strategy this winter. The report of most value prior to drying off is the Milk Recording SCC report. The SCC report generated in the late autumn contains the data vital for selecting the cows most suitable for internal teat seal only and those most in need of antibiotic therapy at drying off. Figure 3 shows a report from some of the older cows in a dairy herd in September 2019.

Figure 3. Part of the Milk Recording SCC report for a dairy herd (September 2019).

The milk recordings that took place during the year are presented in the Milk Recording SCC report. Milk recordings which were over 200,000 cells/mL are highlighted in orange. The data in Figure 3 shows that while a number of the cows will require antibiotics at dry-off, on the basis of their SCC record during the current milking season, the majority may be suitable for teat seal only at drying off, if the other criteria listed in Figure 2 are met.
Step-by-step guide to recording Dry Off events on ICBF

**STEP 1:** Login at [ICBF.com](http://www.icbf.com)

**STEP 2:** Access events portal and select Record Events ‘Dry-Off’
USING RECORDS TO DRY-OFF SUCCESSFULLY

**STEP 3: Select dry off date**

![Selecting dry off date](image1.png)

**STEP 4: Select dry off treatments and ‘Save Changes’**

![Selecting dry off treatments](image2.png)
USING RECORDS TO DRY-OFF SUCCESSFULLY

USING EARLY MILK RECORDS TO CHECK YOUR NEW INFECTION RATE

Use the CellCheck report to check your new infection rate for the previous dry period. Achieving a new infection rate during the dry period of <10% is essential. If the new infection rate was higher than this, it suggests that your dry off technique or management of the cows during the dry period and calving was poor.

Figure 4. Section of CellCheck Farm Summary Report.

This dry period/calving section of the CellCheck Farm Summary in Figure 4 shows the cure rate and new infection rate over the dry period. In this example, the cure rate over the dry period in the herd is substantially below target, suggesting that the drying off process and dry cow management should be re-evaluated.
Effect of selective dry cow treatment on SCC in the following lactation

SUMMARY

• In low SCC herds using an internal teat sealant alone compared to using an internal teat sealant plus dry cow antibiotics on low SCC cows at dry off (<200,000 cells/mL throughout the previous lactation) resulted in higher SCC in the subsequent lactation; however this increase was not large ~ 20,000 cell/mL and the mean SCC of both groups remained well below 100,000 cells/mL

• Milk recording data and recording of clinical mastitis cases are required to identify herds and cows that are suitable to receive internal teat sealant at dry-off.

• When using internal sealants alone at dry off, high levels of hygiene, proper teat end preparation and using the correct infusion technique are essential.

INTRODUCTION

Antibiotic resistance is becoming a major global concern in both human and animal health. Misuse and over use of antibiotics are major contributors to the prevalence of antibiotic resistance. In an effort to reduce this, the European Parliament has passed legislation to restrict antibiotic use in animal production systems. This means only animals displaying subclinical or clinical signs of disease can be treated with antibiotics. Veterinary verification will be needed to treat animals not showing symptoms of disease but are at high risk of infection. Treatment of animals with antibiotics as a prophylactic measure will not be permitted. This will come into effect in the year 2022.
Whole herd treatment with antibiotic at dry off has been a standard component of mastitis control and is currently used in the majority of herds in Ireland. Selective dry cow treatment (SDCT) is an alternative method to whole herd treatment that involves administering antibiotic dry cow therapy only to cows showing subclinical/clinical symptoms of mastitis or those who are at high risk of reinfection during the dry period. Low risk cows are administered an internal teat sealant without dry cow antibiotic. Teat sealants provide a physical barrier against bacterial infection after administration.

**SELECTIVE DRY COW THERAPY STUDY**

A study was carried out on three Teagasc farm over three years (2015 to 2017) to assess the effect of treating cows with teat sealant only (ITS) compared to teat sealant plus antibiotics (ITS+AB) at dry off on infection status and SCC in the following lactation. Cows that did not exceed 200,000 cell/mL and had no clinical mastitis cases during the previous lactation were randomly assigned to either ITS only or ITS+AB. The entire data set included 67, 69 and 177 cows in 2015, 2016 and 2017, respectively. Individual animal SCC data was available for each week of the subsequent lactation over the three years of the study. Individual quarter level samples were available on 4 occasions over the lactation (at dry-off after enrolment, first milking post-calving, 14-days after calving and mid lactation) for culture and bacterial analysis.

**RESULTS**

The cows administrated with ITS+AB had a statistically significant lower mean SCC over the entire lactation compared to the cows administrated with ITS only. The mean SCC across the lactation of the ITS and ITS+AB cows were 80,900 and 60,483 cell/mL respectively. At the end of the lactation the proportion of cows with SCC greater than 200,000 cells/mL was similar for both cows treated with ITS+AB and those treated with ITS alone (30%). Lowering the threshold SCC in the previous lactation from 200,000 cells/mL, to 150,000 cells/mL and 100,000 cells/mL decreased the proportion of cows eligible for ITS only treatment from 48% to 38% and 25% respectively. However, regardless of the selection threshold imposed, cows treated with ITS alone had a higher SCC than the cows treated with ITS+AB.

Across the lactation, 6.0% of the quarters of the cows treated with ITS had bacteria present in the foremilk whereas only 2.6% of the quarters of the cows treated with ITS+AB were infected. The most prevalent pathogen identified was *Staphylococcus aureus*. 
**CONCLUSIONS**

Results from this study show that prophylactic antibiotic treatment at drying off does aid in the reduction of SCC and bacterial infection across the subsequent lactation. However, the SCC and infection level in the present study for both groups were not problematic. The results show that the proportion of cows which exceeded 200,000 cells/mL at the end of lactation was similar for both cows treated with ITS alone and cows treated with AB+TS. Bulk tank SCC readings from all herds in the current study remained below 200,000 cells/mL throughout the majority of the study. This indicates that herds with good mastitis control programmes can use internal teat seal alone at drying off on cows which had SCC of less than 200,000 cells/mL throughout the previous lactation with only small effects on herd SCC.

Further studies have been carried over the last two years at Teagasc Moorepark and on commercial dairy farms which support the results shown above. The results highlight that only herds with a bulk milk SCC consistently <200,000 cells/mL and low levels of clinical mastitis should consider a selective dry cow strategy. Routine milk recording is required to correctly identify cows suitable for teat sealant only. One of these milk recording should be in the last month of lactation. Additionally, a high level of hygiene, proper teat end preparation and using the correct infusion technique is critical when drying off cows.
This series of CellCheck events is being run with the help and support of the local Co-op in each region.