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AUTUMN 2017

Livestock MATTERS

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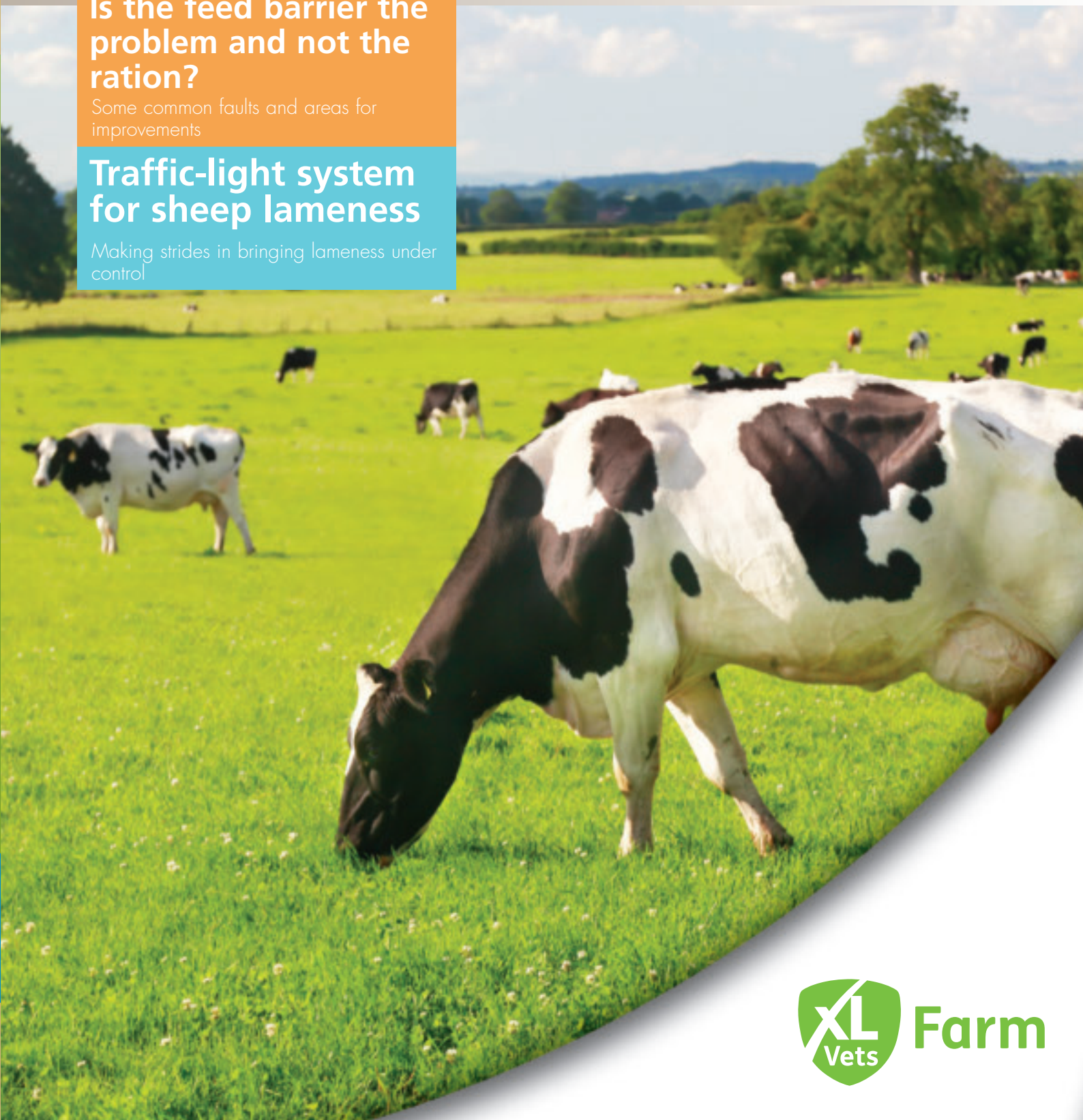

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XLVets is a novel and exciting initiative conceived from within the veterinary profession. We are all independently owned, progressive veterinary practices located throughout the United Kingdom committed to working together for the benefit of our clients.

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THE EDITOR

Welcome to the 'Autumn' issue of Livestock Matters

In this issue we take a look at cattle feed barriers highlighting some of the common faults and suggesting some areas for further improvement. Vets Jennie Lomas and Carolyn Baguley explain that a well-designed and well-maintained feed barrier can make a big difference to intakes, efficiency and stock health.

We also continue with part two, of a four part series, on antibiotic use on farm, looking at some of the key factors affecting the success or failure of antibiotic treatments by reviewing product choice, route of administration and course of treatment. We also find out how one practice has reduced its use of critically important antimicrobials significantly.

Finally, if sheep lameness is bothering you, don't miss the article by Emily Gascoigne, Synergy Farm Health. Find out how farmers George and Sally Lunn have dramatically reduced the incidence of lameness on their farm from 10% - 2% in six months!

We hope you enjoy this issue of Livestock Matters.

Gemma Ayre
Editor

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Mount Vets join XLVets

Alastair Caygill, Mount Vets

In May 2017 Mount Vets became a member of XLVets. Mount Vets is situated in Wellington, Somerset. In addition to the main surgery we have a small animal branch in Wiveliscombe, eight miles to the north, and a farm animal/poultry branch in Broadhembury, fifteen miles to the south west. We are currently building a large purpose built hospital on a green field site on the edge of Wellington. We hope to move into this building in Autumn 2017.

The practice is run by five directors and we have a team of sixteen vets in total. Although the business operates as one entity it is divided into species-based departments.

The farm animal department has nine vets and provides a veterinary service to 75 dairy clients (herd sizes ranging from 50 to 800 cows) and approximately 150 beef and sheep clients. The bulk of our work is clinical, but we are also very involved in education and training, and the practice delivers in-house courses as well as teaching for The Duchy College and The Laura Persey Trust. As with any practice in the south west, TB testing is a significant part of our workload. Alongside the farm animal work we provide a first opinion service to a small number of equine clients.

The poultry and gamebird department has two vets with specialist knowledge in all commercial/domestic poultry and game bird species. The department works from the Broadhembury branch, which is equipped with post mortem and laboratory facilities. In addition to clinical work the department is heavily involved with knowledge transfer at all levels and provides specialist courses for vets, producers and industry. In 2014 Stuart Young was presented with the National Poultry Marketing award for knowledge transfer for 'The South West Poultry and Game Bird Initiative' which he ran with the Duchy College.

As an independent practice we feel that we are strongest when we collaborate with others who have a similar ethos and we intend to make a positive and proactive contribution to all aspects of the XLVets community.

Visiting UK Dairy Day?

This year XLVets are sponsoring the seminar zone at UK Dairy Day, 13th September, The International Centre, Telford.

The first floor Sharing Knowledge Zone includes a dedicated area for seminar presentations. Presentations will commence at 10.00am and conclude at 4.40pm featuring a captivating line-up of 18 speakers. Each presentation will be 15 minutes followed by 5 minutes for questions.

Don't miss Rachel Hayton, Synergy Farm Health, 11.20am - Antibiotic resistance, how is it going to affect me and my farm?

We will also be talking about FarmSkills courses so make sure you come along and say hello to the team.

First anniversary of BVDFree England

Members of Bovine Viral Diarrhoea (BVD) eradication initiatives from six countries came together at a conference in June to mark the first anniversary of the BVDFree England Scheme.

The BVDZero Congress, in Kenilworth, brought together farmers, vets and key industry organisations to hear how Germany had achieved a 23-fold reduction in the number of calves born persistently infected with BVD during the first five years of their BVD control programme.

David Graham, Animal Health Ireland reported that less than one in 1,000 calves born there in 2017 tested positive for the BVD virus, down from 1 in every 150 calves in 2013.

In addition to the main presentations, delegates participated in workshop sessions themed around the key success factors from other countries. Topics ranged from encouraging take-up and ownership to discouraging retention of Persistently Infected animals and drew on the broad range of expertise of those at the Congress.

The day closed with delegates making written commitments to actions they will be taking over the next three months to help drive the eradication of BVD from the UK and Ireland.

Simmental cattle breeder, Bill Mellor, Chairman of BVDFree England said: 'The experience from other countries shows that it is possible to make rapid progress in significantly reducing the impact of BVD on cattle farms. Over 1,000 herds have registered with the BVDFree England scheme during its first year.

'In England much has yet to be done. I ask all cattle farmers and vets to work together with BVDFree England to eliminate this costly disease from our shores.

'If you keep cattle please join us to help make the next generation of cattle in England BVDFree. Farmers, show your support and join the national scheme by signing up at bvdfree.org.uk.'

New standards for Red Tractor Assurance scheme

Farmers who are part of the Red Tractor Assurance scheme will be receiving a new set of farm standards this month ready for implementation from October.

Standards have been strengthened to address key areas of reputational risk to keep members ahead of the game.

Every three years standards against which farmers are assessed are reviewed to ensure they match up to what consumers want and expect from the £14bn of product that carries the logo.

Industry and regulatory affairs manager Philippa Wiltshire said: 'The Red Tractor logo has to continue to stand for something that consumers believe in if it is to retain its ability to positively affect buying decisions.'

Antibiotic use across all livestock sectors has been scrutinised and strengthened standards aim to help producers reduce and record use in line with best practice advice from RUMA, the alliance for Responsible Use of Medicines in Agriculture.

Notably, assured pig producers are now recording antibiotic use on the electronic Medicine Book developed by AHDB Pigs, in preparation for the new standards.

'We recognise that our new standards will require changes in farm management for some, but we also know that continuing to invest in a robust farm assurance scheme will keep consumers coming back to Red Tractor assured products.'

Packs containing the new standards and details of some of the most significant changes will be arriving on farms over the next few weeks.

Summaries of changes and the full standards can be found here: http://assurance.redtractor.org.uk/standards/search

Jennie Lomas, Wright & Morten and
Carolyn Baguley, Scarsdale Veterinary Group

The feed barrier: is it helping - or hindering - dry matter intakes?

Feed ration formulations are designed to meet all an animal's nutritional needs. But having mixed it and taken it to the shed, what about the feed barrier itself? Does it provide the optimum conditions for cows to maximise their dry matter intakes?

Here, vets Jennie Lomas of Wright and Morten and Carolyn Baguley of Scarsdale Veterinary Group highlight some of the common faults with feed barriers and suggest some areas for further improvement.

Veterinary Surgeon Jennie Lomas
XLVets practice Wright & Morten

Veterinary Surgeon Carolyn Baguley
XLVets practice Scarsdale Veterinary Group

'Having a feed barrier that is well-designed and well-maintained can make a big difference to intakes, efficiency and stock health,' explains Carolyn. 'There are some very basic factors, which if ignored, can have a massive impact.

'So it's not an area to cut corners. A holistic approach is needed as feed intakes can be affected by the design of the building, the trough, the barrier and feed management.

'The most common factors limiting feed intakes are: insufficient space along the barrier for all animals to feed, the rough surfaces onto which feed is placed, and stale feed contaminating fresh feed.'

Take a look!

Jennie advises: 'The best way to check if a feed barrier is fit for purpose is to go and have a look at the animals as they line up to eat. Check the backs of cows' necks for hair loss, swelling or thickened skin - signs that the neck rail is too low.

'Where there's a lot of pushing and shoving at the trough, then this demonstrates more space along the barrier is needed - or fewer cattle kept in the building. Even when animals have access to feed 24/7, there will still be peak periods for feeding, such as after milking or immediately after fresh feed delivery. Is there room for everybody then?

'Another sign of insufficient feeding space is when lame or subordinate animals are hanging back and waiting their turn. If there is competition for space during this period, subordinate cows will give way to dominant animals. The animals that have to wait often eat larger meals more quickly but less frequently, which can lead to rumen dysfunction. The increased standing times may also make lameness more likely and injuries may increase.'

Shed design

Jennie adds: 'The area behind the feed barrier where animals stand should be non-slip, and as clean as possible - ideally clean concrete - to reduce dirty feet and legs, and reduce the likelihood of mastitis and infectious foot conditions, such as digital dermatitis and foul.

'If setting up a new shed, then the position of the feed barrier requires some thought. When feed barriers are close to resting areas, this encourages increased lying times and reduces bullying.

'Also, if feed barriers are inside and can be shut off, rather than outside, then this can help reduce intrusion by unwanted visitors. Look closely for signs of vermin or wildlife visiting the feed barrier, since they can introduce all kinds of diseases into the herd - TB, salmonella and leptospirosis, to name but a few.'

The barrier

Carolyn says: 'When stocking the shed, also consider the length of the feed barrier and the numbers of animals and their size. In practice, the space may need to be increased further if, for example, cows are heavily pregnant or the group is uneven, with smaller or less dominant animals having to wait their turn.'

Table 1 provides guidelines on space required at the barrier. The same space requirements apply to beef cattle.

'The neck rail should be offset forwards from the brisket board by 20-30cm, and at a height from the ground of 120-150cm for adult cattle and 90-110cm for younger cattle. The animal's neck should not touch the top rail while feeding.

'Even though a barrier may seem perfect on paper, in practice things may be different, so if installing a new barrier make it adjustable - this gives the chance to see how cattle like it and easily make changes if necessary. Flexible straps or ropes can replace neck rails and will be more comfortable for the cattle.

'Trough sides or brisket boards should be approximately 50cm high for adult cattle, with a smooth finish - any higher will cause obstruction to the lower neck when eating.'

Trough/floor surface

Jennie advises: 'The trough or feed surface should be 10-15cm above the animal's foot height, to relieve excess pressure on the feet and neck. Too high a feed surface, though, can lead to reduced saliva production or cattle wasting food by tossing and sorting it.

'Troughs with a shallow incline, say 20%, facilitate feed staying within reach, and help prevent sorting of mixed feeds.

'Make sure surfaces are smooth and easy to clean, with no sharp edges. In Figure one, the concrete feed surface looks nice and smooth from a distance, but a closer look reveals how rough it actually is. Over time, the acidic silage has dissolved the cement between the stones, leaving them jutting out. This causes two problems - firstly, damage to the tongue and mouth from the rough stones, and secondly, old, rotting feed matter building up in the gaps.

'One simple change that can be made is to paint over the floor with a resin to produce a genuinely smooth, hard feed surface. This is much kinder on the tongue than the concrete, and far easier to keep properly clean. Feed wastage is greatly reduced, and there is no build-up of gone-off feed. A similar effect can be achieved with tiles or plastic.' See Figure two.

Figure one.

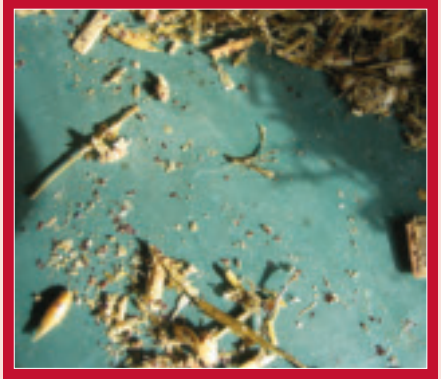


Figure two.

Management

'Inedible, poor quality and mouldy feedstuffs build up easily, and can have a huge impact on health,' says Carolyn. 'So clean surfaces regularly, and completely remove stale feed.

'Feed that is allowed to sit at the bottom of a trough for several days, or even weeks, loses nutritional value and can play host to a wide range of toxins with negative, and sometimes severe, effects on animal health.

'Don't think that animals need less food just because they aren't cleaning up completely - accept approximately 5% wastage as normal, and clear away the leftovers properly before feeding again.

'If the building is designed with feed passages, rather than troughs, then feed needs to be pushed up regularly - at least 2-3 times daily, and more often if possible to maximise intakes and reduce wastage.

'A good diet that meets all an animal's nutritional needs is absolutely vital for the health of that animal, and the importance of adequate access to that diet must not be underestimated. A well-designed, well-maintained feed barrier benefits both your animals and your pocket!' adds Carolyn.

Table 1. Feed barrier width requirements for different weights of cattle

Animal weight (kg)	Minimum width of feed barrier for simultaneous feeding (cm per animal)	Minimum width of feed barrier for ad-lib feeding (cm per animal)
200 - 299	40	15
300 - 399	50	15
400 - 499	55	19
500 - 599	60	24
600 - 699	67	28
700 - 799	70	32
800+	75	32

(Adapted from Red Tractor Assurance for Farms - Dairy Standards, 2017)

Jim Willshire BVSc DCHP MRCVS,
Endell Veterinary Group

Antibiotics: the CIA issue and a round-up of factors for treatment success

Here, in the second article on the subject of antibiotics and responsible use (see the spring issue for the first), Jim Willshire of Endell Veterinary Group explains why it's important to use the right antibiotic product, via the right route and to follow the right course of treatment.

But first, some information on which antibiotic products are Critically Important Antibiotics (CIA) and a report of how their usage can be significantly reduced from vet Julian Allen of Friars Moor Vets.

Critically Important Antibiotics (CIA)

The World Health Organisation (WHO) views antimicrobial resistance as one of the top three threats to human health. The concern is that inappropriate use of antibiotics is increasing the prevalence of resistant bacteria, and ultimately some infections may not be curable.

In 2016, they re-prioritised the importance of all the antibiotics previously considered as 'critically important' (that resistance is not allowed to develop) into three new categories. (See Table).

In the medical sector, the HP-CIAs are now specifically reserved for use in humans only as a second line treatment, and where the bacteria's sensitivity has been demonstrated.

However, in the livestock sector, there's not been the same categorisation of antibiotic importance, and farming references to CIAs are in fact the WHO's new HP-CIAs.

Nor has there (yet) been any official limits put on vets prescribing antibiotics from any of the WHO's categories. However, some supermarkets and milk buyers have now taken the initiative and stipulated that their livestock suppliers avoid use of the HP-CIAs. Some farmers and vets have also voluntarily decided to adopt the same policy.

So which antibiotic products are 'critically important' as regards veterinary usage?

All those in the WHO's HP-CIA category. Some examples:

- 3rd generation cephalosporins - Cefenil, Ceftiocyl, Cevaxel, Eficur, Excenel, Naxcel,Pathocef, Readycef
- 4th generation cephalosporins - Cefimam, Cephaguard, Cobactan
- Macrolides - Apotil, Bilovet, Draxxin, Hymatil, Micotil, Milbotyl, Pharmasin, Pulmotil, Tilmodil, Tilmovet, Tylan, Tylovet, Tylucyl, Zactran, Zuprevo
- Fluroquinolones - A180, Advocin, Baytril, Enrocare, Enroxil, Fenoflox, Forcyl, Marbiflox, Marbochem, Marbocyl, Marbox, Ubiflox

Responsible use is about questioning the routine use of these antibiotics. So, if using a product from the HP-CIA category, can it be traded for an alternative that is less 'important'? The HP-CIA product can then be held in reserve for second or third line treatment, if the first option fails.

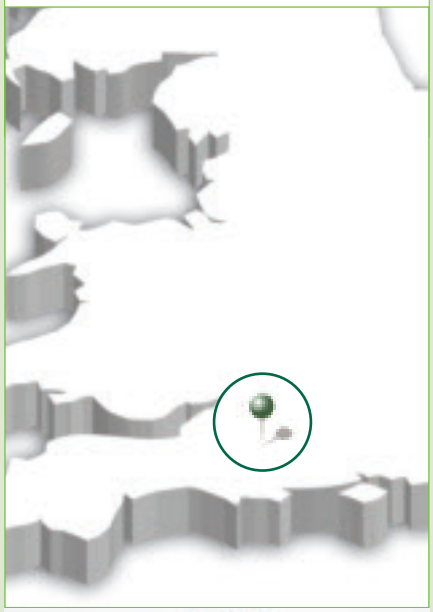
Veterinary Surgeon Jim Willshire

XLVets practice Endell Veterinary Group

The relative importance of Critically Important Antimicrobials		
Medical classification (WHO 1996)	Antimicrobial type	Veterinary classification
HP-CIA - Highest Priority Critically Important Antimicrobials	• 3rd Gen Cephalosporins • 4th Gen Cephalosporins • Macrolides • Quinolones (including fluoroquinolones)	CIA - Critically Important Antimicrobials
CIA - High Priority Critically Important Antimicrobials	• Aminoglycosides • Penicillins/Amoxicillins	
HIA - Highly Important Antimicrobials	• 1st Gen Cephalosporins • Amphenicols • Sulphonamides • Tetracyclines	

Livestock farming without CIAs

FriarsMoor Livestock Health



Friars Moor Livestock Health is one XLVets practice that wanted to improve the responsible use of antimicrobial products on their dairy farms. To achieve this they have encouraged the use of Selective Dry Cow Therapy, and stopped prescribing fluoroquinolones and the 3rd and 4th generation cephalosporin antibiotics.

At the beginning of 2016, they started their 'campaign' to convert their farming clients to use different classes of antibiotics - those categorised by the WHO as being Highly Important Antimicrobials, rather than Critically Important.

Vet Julian Allen explains: 'We looked at all the treatment protocols, and where CIAs were being used, we revised the treatment to include an appropriate alternative product.

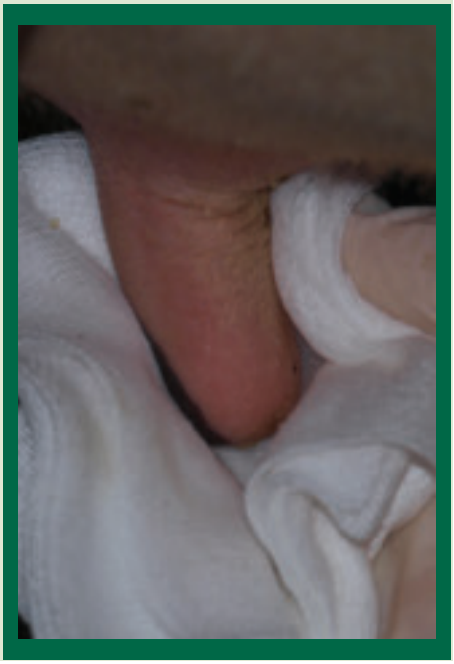
'Some of our clients were a bit wary to start with. So we recommended they were selective with their treatments until they gained confidence in the alternative options. For instance, if an *E.coli* case was not too severe, then instead of giving a fluoroquinolone product, to instead use a tetracycline or sulphonamide-based product, according to their new protocol.

'One benefit of this new approach was that it actually saved money for clients as the CIA antibiotics tend to be more expensive than the alternative products!

'There have been very few problems over the past 18 months, and now all our farms have a no fluoroquinolone and 3rd/4th generation cephalosporin policy - and that includes a wide range of systems from low yielding dairy herds to intensive units.

'In fact, we don't stock any of these products at the practice any more. However, if we find a bacterial infection that is not responding to treatment, and being certain of the bacteria involved, our vets can soon obtain an appropriate CIA product, if needed.'

He encourages any farmer considering taking a more responsible approach to antibiotic use, and farming without CIAs, to get started by talking to their vet.



Antibiotic treatment - getting it right!

Using the right product

Different antibiotics are effective against different types of bacteria (broadly divided into Gram positive and Gram negative types - see previous article in spring issue of Livestock Matters). It's not appropriate to use any antibiotic for an infection, just because there happens to be a bottle already on the shelf/in the fridge.

Farmers and vets have a wide variety of diagnostic tools that can be used to identify the type of bacteria causing an infection. These include milk bacteriology testing for mastitis pathogens, and conducting post mortems to identify causes of pneumonia. Greater use of diagnostics will enable better choices of antibiotic product to be selected.

Antibiotic products are licensed for certain bacteria under certain conditions, and need to be administered at an appropriate concentration and route, as prescribed by the vet. If there is not a licensed product available for the specific case, then vets use a 'cascade' system to identify the best alternative, combined with their experiences and expertise.

However, bacterial populations can change over time, and whilst a farm's mastitis may have been due to environmental bacteria in the past (e.g. *E.coli*), sometimes contagious bacteria (e.g. *Staph. aureus*) can enter the system and product choice needs to be reassessed.

Is it time to review your medicine usage with your vet?

The right route

Antibiotic treatments may be administered by topical/local application close to the target site, e.g. intramammary tubes, or systemically, i.e. injections.

The downside of systemic treatments is that they rely on the antibiotic entering the bloodstream, and this exposes not just the target bacteria but also may kill other susceptible bacteria. These are the 'innocent bystanders' - some of these are 'good' bacteria which have a protective role in occupying space which blocks the 'bad' bacteria.

Not all infections can be reached by topical treatments, but given the option, this is the more 'responsible' route.

When using systemic treatments, injection routes may be intravenous, subcutaneous or intramuscular.

Why the different options? Because the companies that developed these products considered the easiest route for administration and then conducted efficacy trials to formulate their products based on that chosen route. So it's important to read the label and administer the antibiotic as instructed! Else efficacy cannot be certain.

The right course of treatment

An antibiotic's activity may be either concentration-dependent, or time-dependent, and this dictates the treatment course that is prescribed.

The efficacy of **concentration-dependent antibiotics** relies on achieving a required peak concentration, which needs to be above the MIC - minimum inhibitory concentration.

These are the one-shot products favoured for their convenience, and include products containing fluoroquinolones and macrolides.

Their efficacy depends on the total number of antibiotic molecules that reach the bacteria.

So products are focused on giving enough to get a surge in the blood plasma levels and this saturates the target receptors on the bacteria.

But failure to achieve a bacteriological cure will occur when the animal's weight is under-estimated, or the full dose is not given. See Figures one and two.

For **time-dependent antibiotics**, it is not only important to 'finish the course' but also to 'follow the course' and give every dose regularly, as prescribed. For efficacy, these products are focused on the period of time the antibiotic concentrations are above the MIC Figures three and four illustrate examples of good and bad practice. Figure four shows

Figure 1: **Good practice for concentration-dependent antibiotics** (Example of a single-dose product)

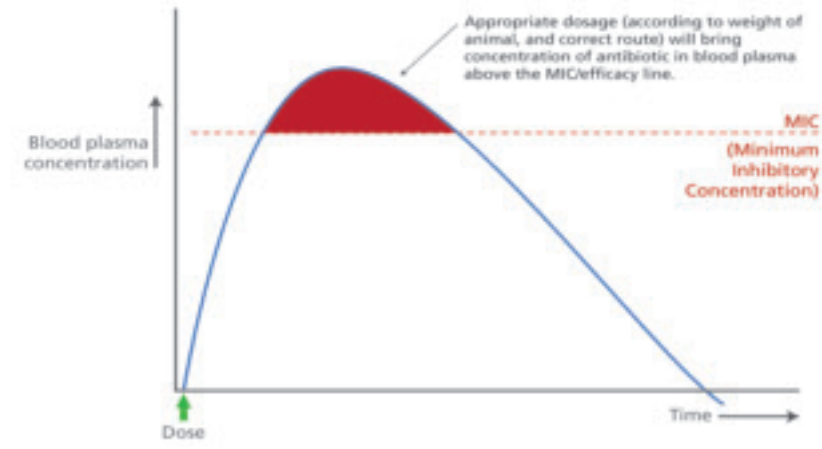
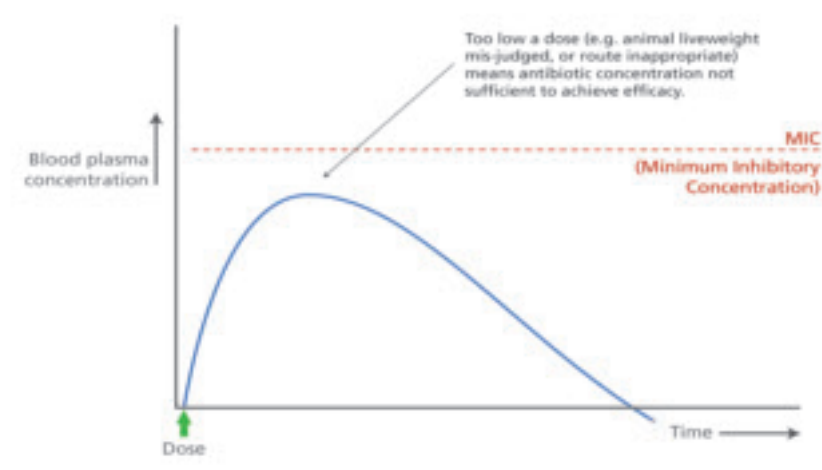


Figure 2: **Bad practice for concentration-dependent antibiotics** (Example of a single dose product)



how missing a dose results in an under-dosing of the animal. Moreover, in this example, it gives two opportunities for bacteria of a more resistant genotype to multiply.

The penicillins and cephalosporins are time-dependent antibiotics. The length of any course will depend on the infection site as some targets/organs will have a better blood supply to them than others. Also, infection levels will vary, and some antibiotics need more time to target the receptors in the bacteria. Vets take all this into account when prescribing treatment courses.

For both types of antibiotic, failure to administer an appropriate dose (dosage or treatment period) can result in the infection appearing to have been cured, but then flaring up again. This is because a clinical cure was achieved but not the required bacteriological cure. Depending on the animal's immunity and environmental conditions, it may self-cure or it may succumb to a recurrence of the infection. (See Figure 5). In the latter case, changing to an antibiotic with a different mode of action is sometimes required.

The under-dosing of an antibiotic treatment may achieve a clinical cure but not a bacteriological cure. The animal's immune system and the environmental conditions will influence the final outcome.

Action plan for change

Responsible use of antibiotics on farms means using antibiotics as little as possible and as much as necessary.' But how and where do you start?

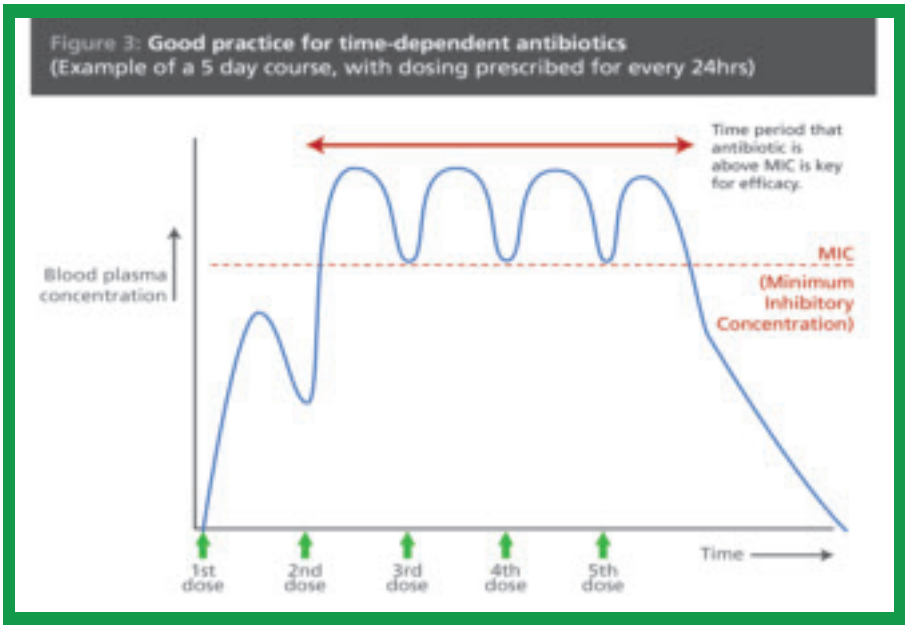
Firstly, involving your vet is absolutely key. Secondly, some changes can happen very quickly whilst others will need to be ongoing. The following 4 point action plan can help focus activities.

1. Reduce the need for antibiotic treatments in the first place, by improving the environment and general health of animals. This may involve investing in better cubicles, improving shed ventilation, vaccinating, reducing stocking densities, etc.

2. Replace HP-CIAs with alternatives. Talk to your vet! Look at changing treatment protocols and substituting alternatives to the 'critically important' fluoroquinolones, macrolides, and 3rd/4th generation cephalosporins.

3. Record all infections, treatments and animal responses. This will help when evaluating the consequences (health and financial) of the changes to the treatment protocols and/or alterations to the management of livestock and their environments.

4. Refine farm practices - have a 6-monthly, or at least annual, review with your vet to look at the outcome of any changes made. Is it possible to further reduce antibiotic usage now? Or do protocols need tweaking?



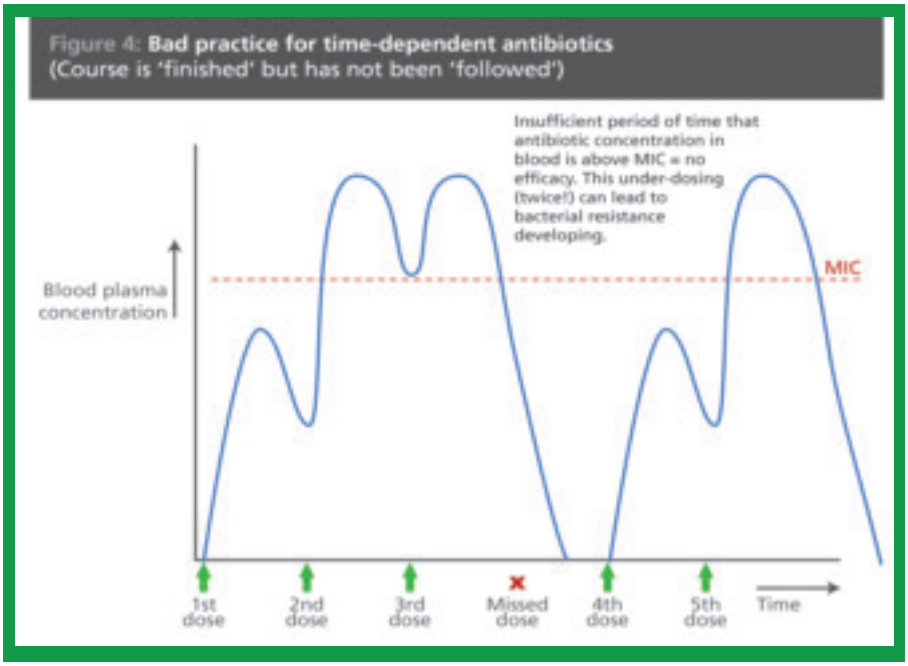
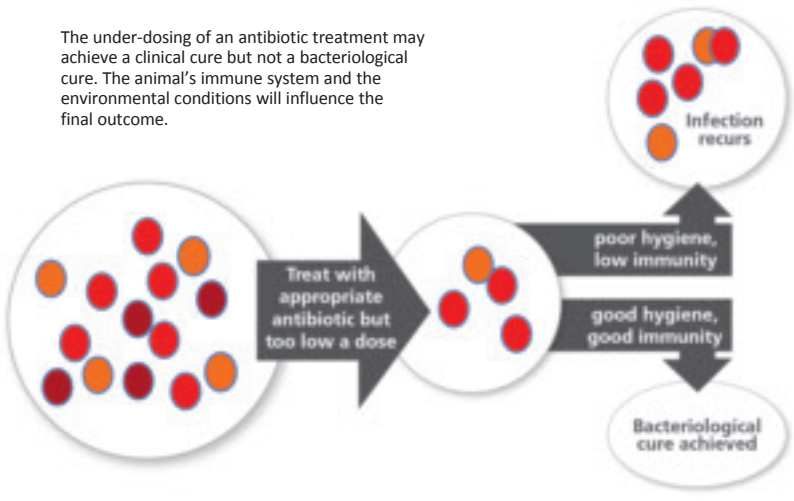


Figure 5:

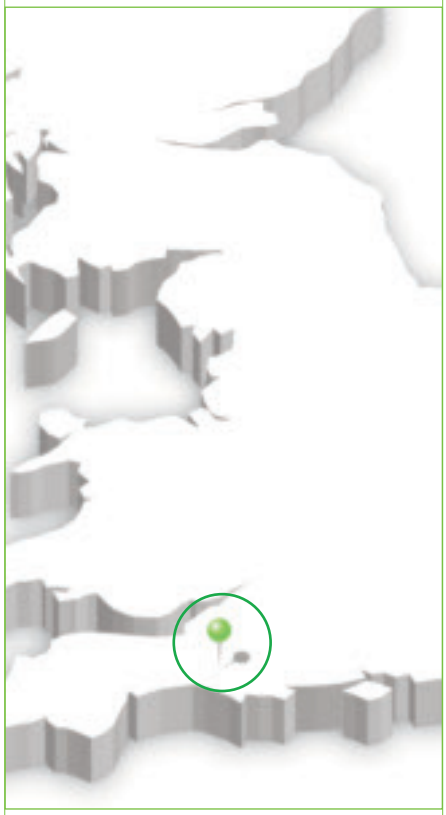
The under-dosing of an antibiotic treatment may achieve a clinical cure but not a bacteriological cure. The animal's immune system and the environmental conditions will influence the final outcome.



Emily Gascoigne,
Synergy Farm Health

A traffic-light quarantine system has got sheep lameness under control

Synergy Farm Health vet Emily Gascoigne has been helping sheep farmers George and Sally Lunn to get lameness under control using a traffic-light based quarantine system, which separates sheep into 'Red', 'Amber' or 'Green' holding groups, according to their foot health.



Veterinary Surgeon	Emily Gascoigne
XLVets practice	Synergy Farm Health

In less than 6 months, the incidence of lameness has fallen dramatically - from over 10% to less than 2%. And a strict system is in place to keep it that way.

At the start

At Heathview near Wareham in Dorset, George and Sally Lunn run a 600-ewe commercial flock of mixed breeds, but predominantly, Suffolk-crosses and Texel crosses. They are put to Suffolk, Texel or Beltex rams and lamb down indoors from February through to April.

George explains: 'Lambs are tagged at birth and recorded onto our EID system, as are any medicines or interventions, and any health issues including lameness.

'A few years ago, we had nothing lame. But then we started to see a few cases, and then a few more. And we started to accept that it was normal to have a few lame sheep.'

But last year, realising that lameness was becoming an issue, the Lunns took advice from Synergy Farm Health vet Emily Gascoigne, and began isolating affected animals, and keeping them all together. This made it easier to treat them and also prevented footrot spreading further into the flock.

However, this was misinterpreted by a trading standards officer making an impromptu visit, and seeing a field of sheep with every single one lame!

The resultant furore, motivated the Lunns to ask for further help to get on top of the problem.

First visit

Emily visited the Lunns in December 2016. She explains: 'The first job was to confirm the cause of the lameness. My inspections showed that it was footrot, not CODD, so the Lunns were correct in their approach of isolating sheep and treating them with antibiotic. But they had

George and Sally Lunn.

also been trimming infected feet, potentially delaying healing time, causing further trauma, and increasing infection spread between animals.

Over a period of 14 days, Emily checked the feet of the whole lame flock. 'We set up a footbath of formalin and those that were sound in all feet - with no lesions or lameness - went through the footbath to form a Green group.

Emily explains: 'The footrot bacterium is thought to live for up to 17 days on pasture. So it's important to only have footrot-free feet going onto footrot-free pasture.

'Where animals had any active lesions, they were given an injection of a long-acting antibiotic. This treatment was recorded on the EID system. These sheep then went straight back to the 'dirty' field so as to keep the other fields 'clean'. This was the Red group.

'Importantly, through all this, there was no trimming carried out!'

Now, lame sheep are given a long-acting antibiotic but, importantly, not foot-trimmed.

Correct antibiotic treatment

Both Footrot and CODD infections can be brought under control with an antibiotic - but it's not the same one!

Emily explains: 'The Lunns had diagnosed footrot correctly, and were using an appropriate antibiotic. But ambiguities in the dosage label had led them to be inadvertently under-dosing it. If in doubt, it's always worth asking your vet to check your calculations.'

Second visit

Emily returned to the farm 10 days later and checked through the Red group again. In about half the cases, the lesions had healed and they were no longer lame - so they were gathered together to form a new Amber group, and sent on to Amber fields.

Emily explains: 'The Amber group are those sheep recovering from footrot, and are effectively in quarantine. These were also walked through formalin after routine handling and inspection. These Amber sheep will be inspected twice a fortnight for physical foot health and mobility, before being allowed into the green group.

'If an Amber sheep goes lame again, then the Lunns have to be very strict - which they are! - and send it back to the Red group.'

Emily adds: 'Footbathing is not a routine part of the Lameness Five Point Plan and where facilities are poor, or chemicals not used properly, it can exacerbate lameness, in my experience. But here, we were bringing infected sheep into close contact with their healed flockmates, so we decided to use footbathing. George and Sally also have good facilities for handling the hazardous nature of formalin.'

By the start of the new year, the numbers of lame Red sheep were in the low teens.

George adds: 'All the lameness cases and treatments are recorded on the EID programme. I put the data straight into my mobile phone by visually reading the tag number and then entering the information. So now, if we find a ewe goes lame a second time, then once she has lambed, she will be culled.'

Lameness and treatments are recorded straight onto George's mobile phone whilst still in the field.

Success!

Emily explains: 'The incidence of lameness, nationally, is around 10%. The Lunns' flock had been above this, but in less than 6 months, the incidence has come down to less than 2%.'

Sally says: 'We seem to have used a lot of antibiotic! But we appreciate it's a medium-term strategy which is needed to improve the flock's welfare and control the footrot. From a commercial viewpoint, the ewes are not sitting down but are up and eating. So we've seen less mastitis, and lambs have done better as the ewes have had more milk.'

Emily comments: 'The advice to treat and not trim may seem counter-intuitive to those who have done it for a long time, or are mindful of industry-wide pressure to reduce antibiotic usage. However, there is a significant amount of evidence demonstrating the benefit of not trimming, and the positive role of systemic antibiotic treatment - when used appropriately.

'The isolating of lame animals is labour intensive, but it has meant we have been able to reduce the risk of new cases, identify chronic ewes, and will hopefully maintain a low lameness outlook for the flock.'

With less lameness, the Lunns have seen less mastitis, milkier ewes, and heavier lambs.

Going forward

Emily explains: The challenge going forward is that there are really only two key times of the year when the Lunns will have the opportunity to get on top of lameness: the period from weaning lambs to tupping, when there are no lambs at foot, and just before they are housed for winter.

'I've not prescribed the footrot vaccine because there's a contra-indication with the wormer being used. But now, with lameness below 2%, the cost:benefit of vaccinating is marginal. However some farmers take the precaution of vaccinating just the rams pre-tupping.'

Sally adds: 'We will normally buy in around 100 replacements for the flock each year. I always check testicles, teeth, and feet. But I'm now being extra-vigilant on feet condition.'

Emily says: 'The Lunns need to assume all new sheep are Red - and could be harbouring footrot or CODD. After isolating them for three weeks, if they are still sound in the foot then they will go through a formalin footbath and be treated as Amber.

'George and Sally have made tremendous strides in bringing lameness under control. This reduction in lameness is having a noticeable effect on ewe condition and performance. Ultimately, improving health also improves performance and there's an added bonus of a reduction in antibiotic usage long-term. Now the Lunns just need to keep doing what they're doing.'

Steve Glanvill, Hook Norton Veterinary Group

Protecting cow fertility and calf health by mineral supplementation

Suckler herds have a much greater reliance on receiving their nutritional requirements from grazing and forages than their dairy counterparts. This can put them at greater risk of soil factors leading to deficiencies in certain key minerals needed for good health and fertility.

Vet Steve Glanvill of Hook Norton Veterinary Group believes that for some farms, mineral supplementation can be the difference between being in profit, or being unprofitable through poor fertility and lost calves.

Soil factors

Steve explains: 'Minerals - selenium, iodine, and copper - all have roles to play in animal growth, health, and fertility. But in some soils there are other minerals that are 'antagonists' which bind these up, making them unavailable to the animal when it consumes the grass or forage.

'For instance, in this area - south Warwickshire and north Oxfordshire - a lot of soil is Warwickshire clay. It contains iron, and also some molybdenum: these bind up copper and can make livestock deficient. Cattle which are lacking in copper have poorer fertility. The classic clinical sign is brown hair around the ears and belly.

'Selenium can be deficient in the soil, and consequently the grass and silage. In cows/heifers, deficiency affects fertility and predisposes animals to retained cleansings.

'Selenium is essential for muscle growth. So in calves, deficiency manifests as White Muscle Disease - the calf is born stiff and can't get up, as its muscles aren't working properly. It can also affect their lung muscles, making breathing more difficult and increasing susceptibility to pneumonia. Survival rate of affected calves is poor.

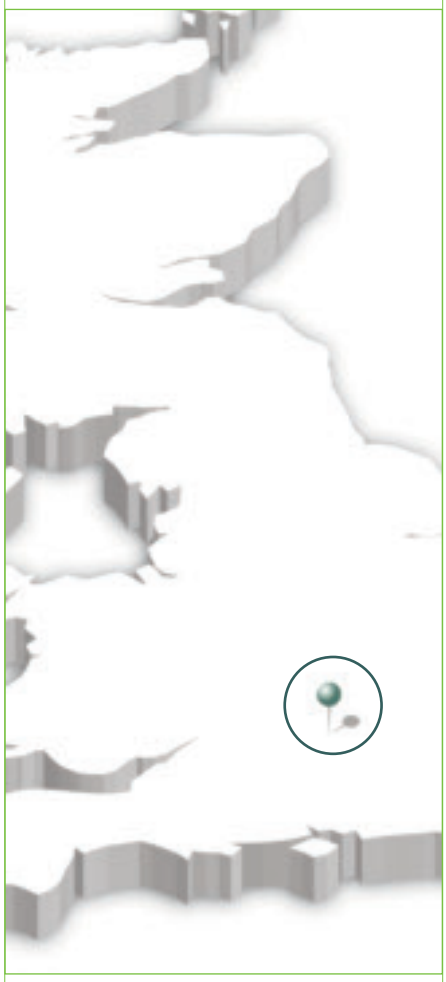
'A low iodine content in soils also has consequences. Signs of a deficiency in cows include low milk yields and retained cleansings. Calves born to iodine-deficient dams may be stillborn or weak and unwilling to suck.'

A grass/forage-based system

Phil Douthwaite, together with his brother Julian, runs a large organic suckler herd and sheep flock at Townsend Farm, near Warwick.

The 200-cow suckler herd is made up of Stabilisers and South Devons, breeds selected for their good forage utilisation. In fact, the herd is heavily reliant on home-grown forages.

The herd is mainly spring calving (March/April). After calving indoors, cows are turned out when calves are a week old. They graze on permanent pasture until early November.



Veterinary Surgeon	Steve Glanvill
XLVets practice	Hook Norton Veterinary Group

Phil Douthwaite's organic suckler herd is heavily reliant on home-grown forages.

Phil points out: 'The ground here is heavy clay - so we have to house them over the winter. Calves will stay at-foot though November and December, with access to a creep area where they receive high quality grass silage and 250g/day of our own grown cereals.

'They are weaned in January, once they have got used to the silage. So it's less stressful for them than at housing. We then increase their creep ration to around 0.5kg/day depending on silage quality.'

Cows and youngstock are all turned out in April, onto grass with no supplementary feeding until September when they are buffer fed grass/red clover silage.

'We can have animals on five different sites within a 5 mile radius of the farm, and the soils are all different. We don't use any bought-in fertiliser and operate with a low stocking rate.

'They'll come inside again in the autumn onto a TMR of grass silage and home grown oats wheat or barley. We try to minimise the time indoors on grains.

'When we started up the suckler herd 20 years ago we were spring calving. But poor fertility meant about 15% of our cows have now formed into an autumn calving group.'

Mineral supplementation

In 2012, the Douthwaites moved over to working with Hook Norton Veterinary Practice, and have been receiving veterinary support and advice from Steve Glanvill.

Steve Glanvill has been providing veterinary support and advice for the past 5 years.

'We had seen signs of copper deficiency in the herd back in 2000. This had been confirmed in soil and forage tests. So since then we had been using copper boluses to resolve the issue' says Phil.

Steve adds: 'Because the herd is organic, we can't just advise multi-purpose minerals as a precaution. We have to blood test regularly to demonstrate the deficiency. So blood tests are taken twice annually in advance of calvings - a critical time.'

In 2013, Phil called Steve out to a newborn calf which was showing symptoms of selenium deficiency with little 'get up and go'. Tests confirmed a low selenium status.

Steve says: 'Because the herd was low in both copper and selenium, I recommended a soluble glass bolus that contained both minerals, and would dissolve slowly over a 6 month period. This has the effect of providing 'sacrificial' copper which the molybdenum and iron then bind to, before it is excreted. This enables the copper in the diet to be available and utilised by the animal.

'Cattle can be given injections of selenium, but along with iodine, this is not stored very well by the animal. But a bolus takes at least a week to dissolve and get into an animal's system. So a selenium injection is given to fast-growing calves as a short-term quick fix to raise levels in the blood, as well as a bolus.'

Iodine deficiency

In 2016, the first five calves born in the autumn calving group were born dead. Blood tests confirmed iodine deficiency was the cause.

Steve explains: 'Iodine deficiency can give rise to poor calf viability. So the run up to calving, and at calving, are the critical times when a good level of iodine is needed. So now Phil administers two different boluses: the fattening stock and youngstock need one which contains copper and selenium.

'The spring-calving suckler cows receive a bolus in January, formulated to additionally include iodine. The smaller group of autumn calving animals are given a bolus if blood tests reveal the need.'

Prior to being weaned, calves do not receive any boluses as their mineral requirements are being met via their dam's milk, plus Phil puts out (organic) molassed mineral buckets which contain copper and selenium.

Phil says: 'This year's calvings have gone well without any veterinary interventions needed - except for a Caesarean in a very young heifer which had got caught by the bull. The calves have all thrived and there have been less retained cleansings, and whites.'

Molassed mineral buckets are put out for calves as a top-up to their dam's milk.

Monitoring mineral status

Steve comments: 'Boluses do require a commitment in time and effort. However, they have the advantage of providing a sustained release of minerals, and farmers can have peace of mind that every animal has received its appropriate daily "intake" for 6 months.

'Mineral buckets have the disadvantage that you don't know which animals have taken some, nor how much they have had. The practice of adding molasses to encourage intakes can also attract badgers, which is highly undesirable in TB areas!'

Steve recommends farms using boluses invest in a neck scoop on the cattle crush. 'These will hold their heads up and can make a big difference, especially if you've a lot to do. The scoop will also be useful when it comes to tagging, or administering intra-nasal vaccines.'

He warns: 'Mineral levels need to be managed. Farmers should make their vets aware of any other mineral sources being given, before decisions on boluses can be made.

'And seasons change, as does grass availability. So ongoing monitoring is important as it can be possible to get an oversupply of some minerals if supplementary feeding is not altered accordingly.

'Lost calves and/or infertile cows can tip farms from profit into loss. A careful watch on mineral status can make all the difference.'

Mineral deficiencies in Phil Douthwaite's suckler herd led to poor fertility and lost calves.

WILLOWS FARM ANIMAL VETERINARY PRACTICE

Veterinary Surgeon **Owen Tunney**

XLVets practice **Willows Veterinary Group**

Owen Tunney, Willows Veterinary Group

Have a breeding plan, then use genomics to make more reliable decisions

More and more commercial dairy animals are undergoing genomic testing to improve the reliability of information on which breeding decisions are made. But, to make this investment worthwhile, it is essential to first have a plan with breeding objectives, warns vet Owen Tunney of Willows Veterinary Group in Cheshire.

Owen is one of a growing number of XLVets' vets who are giving support and advice to farmers on genomics-based breeding programmes. He explains: 'As vets, we are already familiar with our clients' herds, but we're not trying to sell semen! So our independence makes us well-placed to assess the genetic profile of a herd and work with our clients to formulate breeding objectives to improve efficiencies.'

Genomics testing

Genomics testing involves analysing an animal's DNA, from which its genotype can be identified. This saves having to wait for performance data, and removes the effects of environmental variables. Predictions can be made, with greater accuracy, on a range of performance factors, including production, health, type, milk quality, fertility, feed efficiency and longevity.

Owen Tunney explains: 'The reliability of the traditional parent average value of a maiden heifer is only around 25-30%. Genomic tests are significantly better, with up to 60% reliability, depending on the trait.

'Genomics tests can be done on an animal at any age. However, most farms will typically start by testing their maiden heifers.

'Improving a herd's performance is not just about breeding for higher £PLIs (Profitable Lifetime Index). Every farm will have its own specific breeding targets within that. For some, the focus may be to increase yields, whilst others may want better fertility.

'Different farms also have different constraints which will affect the speed that genetic progress can be made. Some need to keep all their heifers for replacements, whilst others can sell off those which don't meet their breeding targets.'

The genomic test

At farm level, the genomic test is simple (see figures one and two). A hair sample – plucked out of the animal so as to include the follicle, is taken and affixed to a bar-coded piece of cardboard, and the ear tag number of the animal is added. It is then sent to a lab for processing. Results can take 8-12 weeks to come back, so forward planning is needed!

Figure one. Hair sample plucked to include follicle

Figure two. The hair is fixed to a barcoded piece of cardboard

Breeding strategy

Owen has been using genomics to advise dairy farmers Kevin and Ann Jones of Bryn Mawr Farm in North Wales, on improving the profitability of their herd. The breeding programme is newly underway with the aim to increase the herd's £PLI, as well as gain an extra income stream by reducing the number of low value black and white bull calves that are born.

The 350-cow Holstein herd averages a yield of 10,000 litres/cow and 4.21% butterfat and 3.39% protein. The milk contract is based on constituents and seasonality, with autumn calving rewarded.

Owen explains: 'Everyone has to start somewhere. At Bryn Mawr, hair samples from the first batch of 47 heifers were taken in December 2016. The results came back in February.

Left to right. Kevin Jones and Owen Tunney with the first batch of heifers that were genomics tested.

'We have drawn a line in the sand, and every heifer from February 2017 onwards will now be bred using decisions based on genomic information rather than parent average information.'

Further batches are being sampled every three months, and ultimately every animal will have its genomics known.

The first batch of tests threw up a few surprises with the £PLI of some cows falling dramatically, while for others it increased. One cow's £PLI jumped up 164 points on the genomic tests, putting it into the top 3% in the country.

Owen says: 'We flushed this heifer, AI-ed her with sexed semen from a high £PLI bull, and were able to collect 12 embryos. These were transferred into heifers of lower genetic merit in the herd. So we have used the information to its full potential.'

At Bryn Mawr Farm, the new strategy is to keep all the heifers, and AI the top 70% – according to the genomic rankings – with sexed semen from a high £PLI bull. The remainder are AI-ed to an easy-calving short gestation Angus bull.

The best 50 cows, as judged by their health and performance to-date in the herd, are also receiving sexed semen, while the rest will get AI-ed to a British Blue bull. Owen adds: 'The cows receiving the sexed semen are healthy cycling cows and have to meet the criteria: to have had normal calvings, come bulling naturally, and not had any metritis or mastitis in early lactation.'

Kevin used to AI the whole herd with conventional frozen semen, spending around £20 per straw. But now he is buying sexed semen for around £30/straw, and beef semen straws for £5. He expects to get around £300 for the beef-bred bull calves, a big difference from the £50 he would have had in the past for Holstein bull calves.

Owen adds: 'So although Kevin is only at the very start of his genomics programme, already there's an extra income stream with a real cost:benefit. There is the potential to make an extra £16,000-20,000 this next year from calf sales. This will more than pay for the genomics testing and the sexed semen premium. Plus the sexed semen is going to be producing heifers with better genetic potential.'

The new breeding strategy will also generate extra income for Kevin, from sales of higher value bull calves.

Kevin is using even better genetic merit bulls than before. He explains: 'when I was using conventional semen, I'd select bulls with a £PLI of 500 or more. But now with the sexed semen, I'm using bulls with a £PLI of over 650.'

Conditions for conception are very good. The herd is vaccinated against IBR, BVD and leptospirosis, all diseases which can impact on fertility. High yielders are kept indoors all year round, receiving consistently good levels of nutrition. Kevin does all the AI, and makes a point of handling the animals quietly.

Kevin admits to having been a bit sceptical about using sexed semen to start with as he did not want to see his 400-day calving interval extended. However conception results using sexed semen have been comparable with conventional semen - averaging less than one and half straws per conception.

Breeding criteria

Owen explains: 'The overall aim is to increase herd profitability, using the profitable lifetime index as a driver for breeding decisions. Within that, we are focusing on a couple of specific traits to rank heifers on fertility and milk constituents.

'The first batch of tests revealed an anticipated £1,044 difference in lifetime profit between the highest and lowest £PLI heifers. And the fertility index showed an anticipated difference in calving interval of 20 days.

Owen adds: 'For the next generation of heifers, we may focus on some different traits - yield and cell count, for instance.

'There is genomics information available for all commercially available frozen semen. So bull traits can also be matched to complement individual cows, or the herd. For example, Kevin doesn't want his cows to get any bigger, so when choosing bulls, he selects against increased stature.'

Getting started

'Genomics tests are only a worthwhile investment if there's a breeding plan in place,' warns Owen. 'The genomic results can then be used to help meet the breeding objectives. They give greater confidence in management, selection and breeding decisions.

'However, the environment has to be right for animals to be able to exhibit their full genetic potential. Some farms have management factors that are limiting, and will need to get back to basics before embarking on a genomics programme.'

Owen adds: 'Farmers need to look at all avenues to stay competitive, especially with milk prices tightening. For farmers already doing everything really well, then using genomics to improve herd potential is the next step in improving efficiencies.'

Owen is one of an increasing number of vets delivering the CLARIFIDE genomics package. This is a veterinary-led genomics package that aligns genomic testing with breeding objectives and herd health goals. It is available exclusively through XLVets practices.

Sian Robinson & Katy Farmer,
Allen and Partners

Calf growth rates improved thanks to Calf Tracker scheme

In 2015, XLVets launched Calf Tracker - a vet-led scheme to help beef and dairy farms to accelerate growth rates and improve the health of young calves and, ultimately, get heifers in-calf sooner. Since then, more than 130 farms have signed up to the scheme through their veterinary practice.

At Allen and Partners in Whitland, Carmarthenshire, vet Sian Robinson supported by vet tech Katy Farmer (also a qualified RVN) has soon seen improvements in calf performance thanks to 'measuring and monitoring' for Calf Tracker.

Veterinary Surgeons	Sian Robinson & Katy Farmer
XLVets practice	Allen and Partners

Calf Tracker

Sian explains: 'The optimum age for a dairy heifer's first calving is 22-24 months. Calculating back, this means that growth rates in the first 8 weeks of life need to be around 800g/d to achieve this.

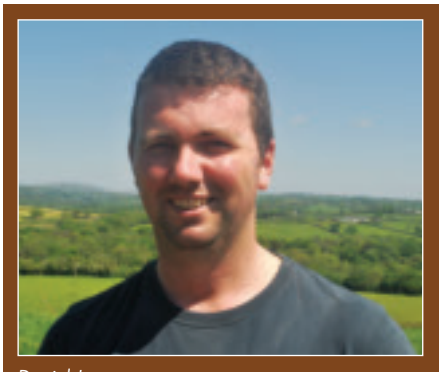
'Feeding calves to grow at a young age is so much more profitable than trying to feed them more later in life. But farmers need to be monitoring their calves' performance to ensure their growth is on track.'

The Calf Tracker scheme focuses on the measurement and monitoring of five Key Performance Indicators (KPIs): growth rates from birth to weaning, mortality, scour rate, pneumonia rate and a measure of antibody transfer from colostrum in the first week of life.

Sian adds: 'We are finding that the main two reasons why calves don't grow at the target rate are because of poor quality colostrum which makes them more susceptible to disease, and the under-feeding of milk replacer - not the volume, but the amount of powder used!'

Gellyolau Farm

Daniel James of Gellyolau Farm near Whitland signed onto the Calf Tracker programme last October. His 320-cow herd is summer-grazed and averages 7,400 litres/cow yield. The average age at first calving is 27 months, but he would like to improve this.



Daniel James.

Daniel explains: 'We have a mark on the crush to tell us when they are at least 1.25m high at the withers, and can be served. We're not too worried about the calving index - currently 401 days - as we calve all year round, however at the same time, profit is all about getting cows back into calf.'

Katy Farmer now visits fortnightly to measure and record the KPIs. She explains: 'I weigh-band all the calves from birth up to weaning, and if any are scouring I'll take samples for analysis. To check that calves are getting the immunity from the colostrum, I also take blood for total proteins analysis. With only a fortnightly visit, some calves are too old to be tested, but we're getting enough samples to monitor the situation.'

Katy Farmer's fortnightly visits include weigh-banding calves to calculate growth rates.

Colostrum quality

Since taking up the Calf Tracker scheme, Daniel has been using a refractometer to check colostrum quality before feeding it to calves. He reckons only about half of it comes up to the recommended standard.

Sian says: 'Total proteins levels have been very good except for a short period when the refractometer was broken and colostrum quality wasn't checked. During this time, 6 calves died from *E.coli* and rotavirus. Scour samples taken by Katy backed up the

This graph is produced by the Calf Tracker programme, the green dots represent the calves with growth rates that are on target.

diagnoses. We think they must have been fed some poor colostrum, and so didn't have sufficient immunity to combat the disease challenge.

'I've suggested vaccinating the cattle to boost colostral antibodies for rotavirus, coronavirus and *E.coli*, but Daniel is still considering this. Farmers shouldn't see vaccination as a failure. It's an aid to preventing problems, and goes in hand with good management and housing.

Faster growth

'There are cost-savings to be made when calves grow faster when younger, and can be bred sooner,' says Sian. 'Once weaned, Daniel's heifers are contract-reared, and he pays a daily charge per animal for this. So there are big savings to be made here.'

Calves used to be grouped in pens of three, but last autumn Daniel invested in some individual pens where they stay for the first 10 days of age. Here, after two days on colostrum, calf milk replacer is now fed at a new rate of 125g/l, (an increase from what used to be weighed out). At 10 days of age, calves are grouped into threes, and concentration is increased to 150g/d. Over the winter months, calf jackets were also used for the first time.

Sian says: 'Ideally, one person should be responsible for calf-rearing as this gives consistency, but sometimes real life steps in. There are four people on the farm who feed the calves, and the system needs to be one that's easy to follow.

'Growth rates from birth to weaning at eight weeks have increased to 500g/d but the target is 800g/d so there's still more to do. I'd like to see the calves receiving 900g/day of milk powder - or 6l at 150g/l - and have access to concentrates and water from 2 days old.'

Daniel explains: 'When you are working on a farm you can become a bit blind to aspects of herd management. Signing up for Calf Tracker is keeping us on our toes, and gives us some outside opinion. We didn't have a clue as to how well our calves were growing, we just noticed that by a certain age, some of them were smaller. We'd put this down to them being bullied and put them back to eat more cake – which has a cost!

Catershook Farm

An increase in the amount of calf milk powder was also needed at Catershook Farm where the 200-cow herd is in transition from all-year-round calving to an autumn block. Milk yields average 8,000 litres/cow. Heifers are bred once they reach 330-350kg, and the average age at first calving is 26 months.

Matthew Davies has taken over the calf rearing from his father Hywel, and was initially following the same feeding regime.

Calves are bucket fed in groups of 6 to 10, and do not move groups. Weaning is at a target weight of 80kg (twice the birth weight).

Matthew signed onto Calf Tracker last autumn, keen for any help which would improve the business. The herd receives fortnightly fertility visits and on the alternate weeks, Katy visits to carry out the Calf Tracker checks.

Sian says: 'It was clear at the start that Matthew was doing a lot of things right, but he could have been doing some things better. He was under-feeding milk powder, and since increasing it to the recommended minimum 125g/d, plus increasing it during colder weather, growth rates have increased significantly. Calves are now growing at 600g/d purely from increasing the powder rate and being more vigilant on colostrum quality.

Matthew explains: 'We would only freeze colostrum from cows that tested Johne's-free, and we never pooled colostrum. We'd never tested its quality before though. But now I'm using a refractometer, and I'm finding about a third of samples need to be thrown away.'

Matthew Davies.

Matthew now checks the quality of all colostrum, using a refractometer.

Sian advises: 'Frozen colostrum bags should always be labelled with the identity of the cow. Then, if a Johne's test comes back positive, all her colostrum should be thrown away.'

She adds: 'With Katy's fortnightly Calf Tracker visits, both Daniel and Matthew have an extra point of contact with the practice, and more opportunity to get advice. Daniel has been quicker to contact us at the first sign of a problem, and we are seeing less disease on the farm. Matthew has been getting advice on calf husbandry and housing.'

FarmSkills
GROWING FARM BUSINESS SUCCESS

Practical Guide

Welcome to our series of FarmSkills practical guides that aim to provide you with top tips and best practice advice for a range of on-farm animal health tasks.

Safe administration of medicines on farm

Vicki Shepherd, Penbode Vets

Penbode Farm Vets

Whether giving medical treatment to a sick cow, or vaccinating animals on a herd level, the medicines we use on farm can only work as well as the manner in which they are handled and administered. The details of medicine administration can make an easy job completely impossible (think needle size) or can make a medicine completely defunct (think incorrect injection site).

So, with an aim of making life just that little bit easier, here is a brief guide to administering medicines on farms.

Medicine storage

'Store in a refrigerator' …. Whilst, for the most part, medicines bearing this notice are kept chilled, it is also one of the most likely reasons for vaccine regimes to fail. I write this today on a hot day in Cornwall. The 22° heat, (whilst much more pleasant to work in than the more typical sideways rain!), poses a risk to working with medicines. Vaccine administration to a herd can take hours. The first cow in the crush may have had her vaccine only recently removed from the farm fridge, but that 200th cow through the crush is a very different story.

Make sure you check all medicines bought from the vet for storage instructions - there are other medicines which must also be kept chilled e.g. hormone medicines such as Oxytocin.

Check medicine packaging to ensure the product is stored correctly.

Bottles which have been breached should be used within the time stated on the packaging, i.e. within hours or days.

Top Tips

- Keep a cool bag strapped to the side of the crush, with ice packs inside for using medicines on a herd level which must be kept chilled
- Only remove a small number of doses from the fridge at a time
- Write with a permanent marker on the side of the bottle the time and date the bottle was breached

Needle size

Having the most appropriate needle size to hand for a certain medicine can make administration much easier. Different sizes are also more useful for different injection sites.

Below is a guide, albeit not written in stone, about what needles may suit the job at hand:

Needle size	Best suited for
14G	Calcium injections for milk fever.
16G	Anything white, such as penicillin; thick syrup-like medicines, such as oxytetracyclines.
18G	Most other, 'thinner' medicines, such as meloxicam/flunixin
21G	Local anaesthetic injections for disbudding.

Needle size	Best suited for
1 inch	Calves and sheep, or injections under the skin.
1.5inch	All injections into the muscle of mature animals (needs to go deep enough to pass through fat layer); local anaesthetic injections for disbudding; injections under the skin in fit animals.

Injection site

Different medicines require different injection sites, and it is not uncommon for medicines to mistakenly be given in the wrong location, be sure to double check with your vet, or on the datasheet, if using a medicine you are unfamiliar with. Always give the bottle a vigorous shake before drawing up, to ensure the suspension has been thoroughly mixed, and the animal is receiving the amount of active ingredient intended.

1. ***Subcutaneous,* s/c, (under the skin):** Refer to the data sheet for individual medicines as to where to administer e.g. neck, over the ribs. Pinch the skin between your thumb and index finger, and insert the needle parallel to the body of the animal. Be sure not to 'strike through' and insert the needle straight through the fold of skin - you will know soon enough if you see any liquid dripping down. Commonly used medicines which must be given here include:

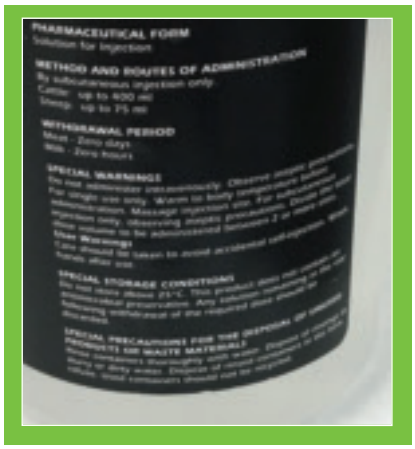
a. Meloxicam (in anti-inflammatories)

b. Some vaccines

c. Some antibiotics commonly used for calf pneumonia or sheep lameness.

2. ***Intramuscular, i/m* (into the muscle):** Remove the needle from the syringe. Pat the animal with the side of a clenched hand two or three times, and on the last time, insert the needle perpendicular to the rump in one swift, confident movement.

Connect the syringe, and before injection, pull back on the plunger to ensure you are not injecting into a blood vessel. Again, refer to the data sheet for particulars, but refrain



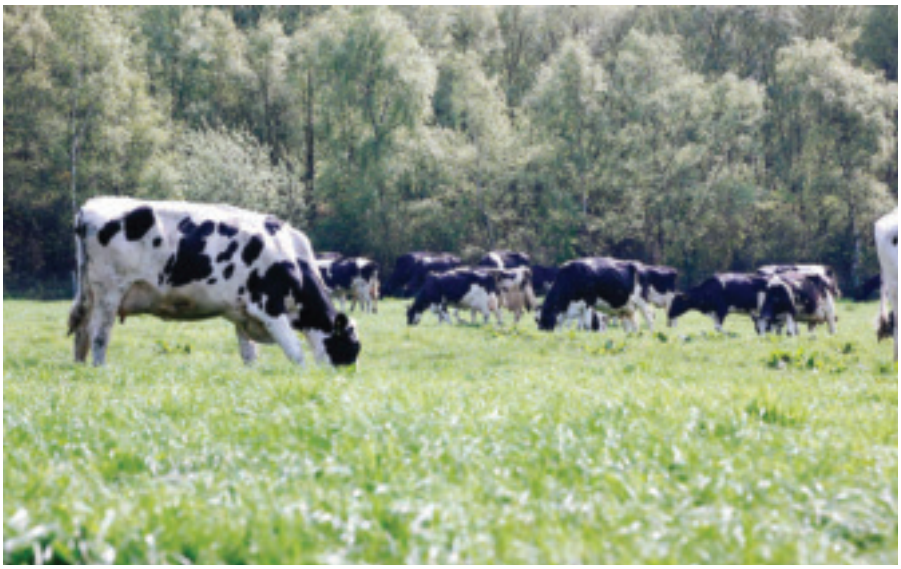
from injecting large volumes into one site. It is better to split the medicine into smaller injection volumes in various sites. Commonly used medicines include:

a. Many antibiotics

b. Some vaccines.

3. ***Intravenous, i/v,* (into the vein):** Your vet will be happy to outline the procedure to you if you are confident enough to inject into this site. Care must be taken however, since medicines given extra-vascularly (outside the vein) can cause local tissue reactions, and medicines given too quickly i/v can cause collapse or even death. The most important take-home message here is to never inject into the mammary vein, and if you are not confident injecting i/v, it is best to give the vet a call.

Whilst our patients are not always cooperative, taking some time to check and administer medicines carefully makes it a safer job, for animal, farmer and vet alike!



Veterinary Surgeon	Roland Millar
XLVets practice	Lambert, Leonard and May

Roland Millar, Lambert, Leonard and May

Using technology to inform decisions

Having graduated from Nottingham last year, I began working as a farm animal-only vet with Lambert, Leonard and May (LLM) in September 2016. I am now one of five vets working at the Lancashire practice near Preston. Our client base consists of predominantly dairy farms, with a mixture of beef and sheep as well. This gives scope for plenty of variety, and the opportunity to gain experience in all the main areas of large animal work.

It's been great to work with such a proactive team that's at the forefront of farm animal veterinary, and has offered invaluable support and advice throughout my first year in practice. I also received some excellent training through the XLVets New Graduate Scheme.

Using technology to improve decision-making

On farm data collection, analysis and reporting is a big part of the service we offer and having access to accurate, up-to-date data helps both vets and farmers make more informed decisions about the animals and businesses we work with.

Recently we have invested time in promoting a computer software program which is designed to allow data entry on farm via a mobile/tablet app. The program also links to BCMS, milk recording data and some other on-farm software, but can be especially useful for farms currently not using computer recording technology.

It provides an efficient and effective tool for use on our routine fertility visits. I can produce a list of cows needing to be scanned, and while I'm there the farmer can access information about each cow. We can see her medical history and previous breeding events, as well as treatments, milk recording data, mobility scores, body condition scores, lameness, and any metabolic or transition problems she has had. This knowledge helps us make decisions about her future. The program has even more potential as time goes on and more data is entered.

Informed decisions

It can take a little longer to collect the information for some decisions, however.

In my nine months in practice I have seen a number of downer cows. These cases are rarely straightforward as our clients have often already covered the usual bases of anti-inflammatories, mineral supplements and supportive therapy. In fact, it is testament to the practice that the vets here have been very proactive with training and knowledge transfer, enabling farmers to give the best, most effective first-line treatments as soon as possible.

Downer cows can be complex cases to work up and it can be important to quickly establish a prognosis and decide how best to continue treatment. A useful aid in doing so is to take a blood sample and check for any increases in the muscle enzymes, Creatine Kinase (CK) and Aspartate Aminotransferase (AST). These are released into the blood stream when muscle is damaged. The magnitude of elevation of these enzymes is a useful prognostic indicator: levels

above a threshold for each day that a cow has been recumbent, usually correspond with a poor outcome.

Ultrasound scanning

Another tool that can provide useful information to aid with decision making is the ultrasound scanner. This can be of value for more than just fertility work.

In May, I organised a CPD event for eight LLM vets on further uses of ultrasound scanners. This practical session was led by Dr Gayle Hallowell, an internal medicine specialist from the University of Nottingham (Figure one).

The tutorial focused on using ultrasound to diagnose a range of diseases including kidney infection (pyelonephritis), peritonitis and pneumonia. The extra information provided by scans allows us to better assess the extent or severity of disease. In turn, this enables more informed decisions about treatment options and improves our ability to predict the chance of a successful outcome.

I demonstrated the use of this in a practical sense a few weeks later by scanning the lungs of two calves, both of which had pneumonia. One calf in the early stages of pneumonia had a high temperature and we could see that only the front lobes of the lungs were affected. However, in the second calf, which had had previous cases of pneumonia and had not responded to treatment, the scans showed that the entire lung was affected (Figure two). This calf did not have a high temperature and so with no active infection present the lung damage was likely to be historic and irreversible.

Building relationships

It is important to note however, that technology is only as good as the data it receives and only when high quality, accurate information is entered can it then be used effectively on farm.

This also relies on vets and farmers developing the mutual trust and respect which are needed when difficult decisions have to be made. For me, having a good working relationship with farmers is one of the best parts of the job. Time spent discussing the weather, milk and meat prices and other areas of farming outside of veterinary helps build these relationships. Moreover we can discuss the complex subjects of dairy cow nutrition, transition management and fertility etc, but ultimately the productivity of a whole lactation or the health of a herd in general can depend on what the weather does in May and the quality of first cut silage!

Figure one. LLM vets receiving extra training on further uses of the ultrasound scanner.

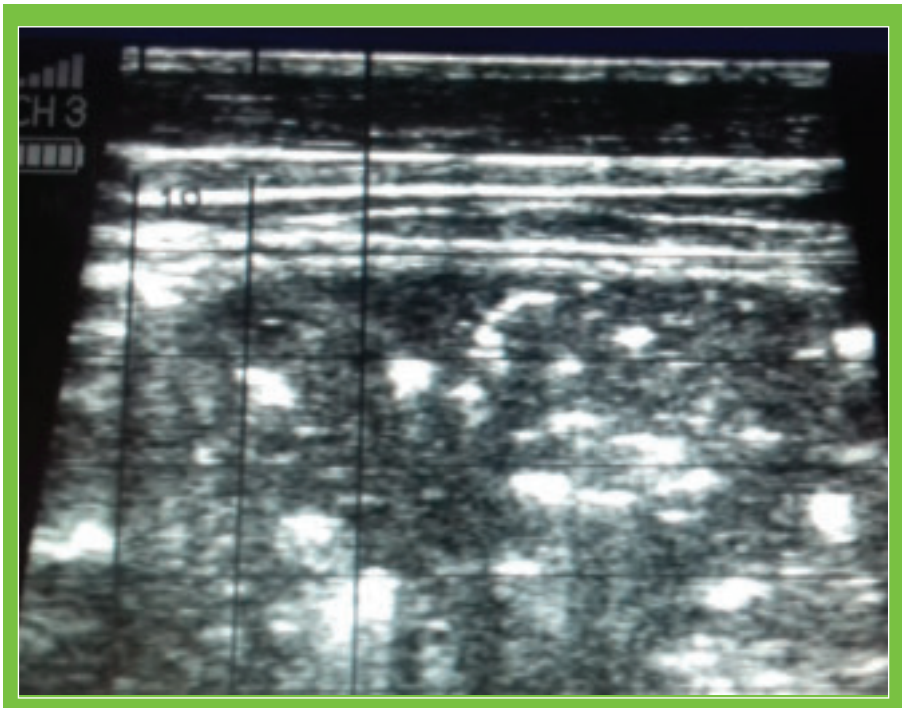


Figure two. An ultrasound scan of diseased lung tissue in a young calf.

About Roland Millar

Born and bred in Stewartstown, Co Tyrone, Northern Ireland I grew up in the heart of Mid Ulster and prime farming land. It was here, helping my grandfather with his Texel sheep, that first got me interested in farming and on the path to becoming a farm animal vet. This led to undertaking work experience for several summers at Parklands Veterinary Group, Cookstown (XLVets). Here I had the privilege of shadowing several highly skilled vets who willingly shared their experiences and reinforced my interest in studying to become a vet.

I chose to study at the University of Nottingham, as the high percentage of practical learning throughout the course really appealed to me. For work placements during my time at university, I was always drawn to XLVets practices having found them to be forward-thinking, have high standards, and always willing to share their knowledge and expertise.

In my spare time I like to play golf, go hill-walking and support Spurs. I have been a keen hockey player in the past and hope to get back into the sport some time soon.

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25 October 2017	Derbyshire	The Whats, Whys, Whens and Hows of Veterinary Medicines
15 November 2017	North Yorkshire	Calf Rearing - Birth to Weaning for Beef and Dairy
21 November 2017	Brampton	DIY AI

South

4 September 2017	Devon	DIY AI
5 September 2017	Dorset	Foot Trimming (3.5 days)
20 September 2017	Oxfordshire	Sheep Lameness
25 September 2017	Dorset	Professional Foot Trimming
3 October 2017	Dorset	DIY AI
18 October 2017	Oxfordshire	Safe and Effective Use of Veterinary Medicines
22 November 2017	Oxfordshire	Practical Calving

Please note dates are subject to change

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