With thanks to the **Lemon family** of **Alkmonton House Farm** for this photo of their beautiful heifer twins!

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Farm news

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Twins in Cattle

Double trouble or twice as nice?!

Last month, my own twins turned three. It feels like a lifetime ago that I first saw their two little squirming shapes on my ultrasound screen (yes, I did self-scan) and ever since then I've been a bit obsessed with finding twins in my patients, too. If you want to find out a bit more about twins in cattle, read on!

How common are twins in cattle?

Twin rates vary farm to farm, but they happen around 5 % of the time in dairy cattle and 1 % of the time in beef cattle.

Why do they occur?

Almost all twins in cattle are non-identical (dizygous) twins, meaning they come from a double ovulation of two separate eggs that were both fertilized and both implanted. There are a number of factors that make double ovulations, and hence twinning, more likely:

1. Breed and genetics

Twins are more common in Holsteins than in other dairy breeds, and there's also a known inherited genetic effect, with twins occurring more commonly in certain family lines.

2. Age and parity

Twinning rates increase from first to second parity, and again from second to third parity, and then more or less plateau for the rest of a cow's reproductive life. This is partly because older cows have double ovulations more frequently, and partly because their bigger, more mature uteruses are better able to support multiple pregnancies – if heifers conceive twins, the foetuses are more likely to die before they reach full term.

3. Season

We usually diagnose a lot of twins at 1-2 months' gestation between October and December, and consequently see more twins born in the following spring and summer. It's thought that the cooling temperatures from August and September onwards, which encourage higher dry matter intakes than during the heat of the summer, coupled with better quality, higher-energy feed in these months, encourage a 'flushing' effect with more multiple ovulations.

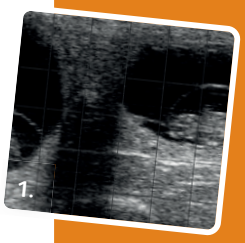
4. Level of milk production

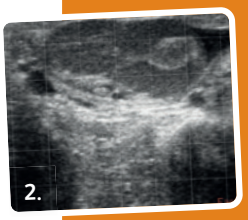
Milk production is the primary factor affecting the incidence of double ovulation in lactating dairy cows and, in Holsteins, twinning rates have increased over time as production levels have increased. The reason for this lies in the way the hormones controlling ovulation are metabolized. High milk production drives increased feed intakes, which in turn cause increased blood flow to the digestive tract and the liver. This causes the liver's metabolic rate to increase, which means it breaks down steroid hormones, including progesterone and oestradiol, more quickly, and the levels of these hormones that are circulating in the body therefore reduce. Because progesterone and oestradiol have an inhibitory effect on other hormones that stimulate follicle growth and ovulation (e.g. FSH; Follicle Stimulating Hormone), lowered progesterone/oestradiol levels in high-producing cows during the growth of a pre-ovulatory follicle allow the levels of other hormones to increase and circulate at higher than normal levels. This makes ovulation of two follicles, rather than the usual one follicle, more likely.

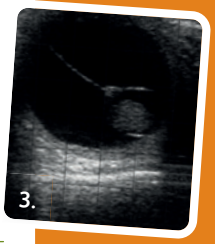
5. Ovarian Cysts

There's an association between dairy cows diagnosed with cystic ovaries early in lactation and the incidence of double ovulation. It's thought that cows that have been cystic are more likely to double ovulate, and therefore go on to conceive twins, because of the absence of progesterone (rather than the presence of a cystic structure itself).

How do we find them when we're PD'ing?







Images kindly supplied by IMV Imaging.

1. Twins are easiest to find between about 30 and 60 days. Beyond this it gets a lot harder to spot them as the foetuses are bigger and further away. Sometimes it's easy to find twins, because we suddenly see two foetuses on the scanner screen at once!

   When twins are identified at 30-40 days gestation, we'd recommend re-checking the pregnancy after 60 days to check foetal viability and help establish if one or both foetuses have been lost. Confirmation of the twin pregnancy at this stage means that the timing of drying off can be decided. They're not always that obvious, though, so there are some other tell-tale signs that we can look for when scanning.

2. The number of CLs (corpora lutea) on the ovaries. Because most twins are from a double ovulation, there will be (at least) two CLs on the ovaries. One CL = one foetus (except in the rare cases of identical twins), but if there are two CLs and we've only seen a single foetus, it's worth going back and looking a bit harder for twins. If they're in different uterine horns (the two CLs will be on different ovaries in this case) and are therefore too far apart to fit on the screen together, it can be quite tricky to be sure there are two foetuses and we're not just seeing the same one over again!

3. The 'straight line effect', where the normally rounded membranes that surround the foetuses form a straight line as they push up against each other. Here we can only see one of the foetuses, but the straight line gives us a clue that there's another one somewhere!

For more information call our practice on **01332 294929** or email **farmandequine@scarsdalevets.com**

What's the downside of having twins?

- There are quite a few, both for the cow and the calves. Abortion and stillbirth rates are higher, premature births are more common, birth weights are lower, the calves can end up in a real tangle at calving, and neonatal death rates are higher. All these are more common when the twins share the same uterine horn – the outcomes are better if they're further apart in different horns.
- Beef cows tend to cope far better with having twins, but the health effects on the dairy cow can be huge – mothers of twins experience more ketosis, more retained placentas, more metritis and more LDAs, with the knock-on effects on fertility that all these disorders bring, leading to an increased overall culling risk and a shortened productive lifespan.
- Infertility due to freemartinism occurs in about 90 % of heifers that have a bull twin. At about day 40 of pregnancy, the blood supplies of the two placentas merge and hormones that, in the male, are responsible for development of the male reproductive tract cross over to the female. This causes the heifer's reproductive tract to be severely underdeveloped and, in some cases, to have male characteristics. If a male twin dies after the first month and a half of pregnancy and is then reabsorbed, the (now apparently single) heifer calf can still be a freemartin. Surviving male twins can also be affected by reduced fertility.

Can we prevent twins?

- Because it's the cows with higher milk production and better fertility that are more predisposed to twins, it's often hard to select against this, although not breeding replacements from known twinning families can help.
- There's some work from the USA to suggest that hormonal manipulation can help reduce the chances of double ovulation in high producing Holstein cows. Researchers suggest the best strategy to accomplish this is to submit cows to first timed AI after a Double Ovsynch protocol (i.e. 2 Ovsynchs in a row).
- Bilateral twins, growing in different uterine horns, have a better chance of survival, but another thing that's been tried with twins in the same uterine horn is 'selective reduction', which involves pinching and squashing one of the foetuses early in pregnancy to leave a single healthy foetus. I'm not sure about the ethics of this, and it can result in the loss of both twins, but in theory it is an option. Another option, which again I'm not sure about the ethics of, is to abort the whole pregnancy and start again.

What can we do to help?

Before calving:

- Dry off earlier. Twin pregnancies are on average 5 days shorter than singletons, but they will often calve a week or two early. An early dry off allows an adequate rest and an adequate length of transition.
- Kexxtone™ boluses reduce the incidence of ketosis in at-risk cows, and are a good idea for twin mothers due to their greater risk of ketosis. Administer a bolus 3-4 weeks before the expected calving date.
- Given that energy demands during gestation are 50 % to 70 % greater for cows carrying twins compared to singletons, and given that cows carrying twins have lower prepartum DMIs, you'd think that feeding twin mothers differently during the dry period might be a good idea. However, research from the USA indicates that this isn't the case, and altering nutritional management to increase energy during the dry period does not improve metabolic status for cows carrying twins.

At calving:

- Be around to help. Twins can get tangled, and if you're on hand straightaway there'll be a better chance of a good outcome. If you're struggling to sort out the legs and heads, give us a call – it's much easier after some uterine relaxant and an epidural, and all our vets love untangling twins!
- If only one calf has made an appearance, always go back in and check for another. And after the second one's been born, go back and check again – triplets do happen!

After calving:

- Twin calves are more at risk of disease and death and will benefit from extra-careful attention to things like colostrum intake, navel hygiene and keeping warm (their smaller size means they can be more susceptible to cold).
- Twin mothers need as much TLC as possible to get off to a good start. This might mean living in the 'special care' pen for a week or two, and it definitely means getting:

1. **Plenty of space**

   Space to eat, to drink, to lie down comfortably, to move around without other cows getting in the way, to relax, and to get fresh air. Make sure the minimum recommended measurements for feed, water and lying space are met, and exceeded wherever possible.

2. **Plenty of food**

   Twin mothers' DMI is lower before calving than other cows', and so it's extra important to maximise it afterwards. Feed space, and opportunities to eat, need to be maximized – now is not the time to overcrowd, to skimp on push-ups, for cows to have to fight to establish themselves in the hierarchy or for them to be struggling with bully cows who won't let them feed properly.

3. **Plenty of water**

   Being given a small plastic cup half full of water after giving birth just didn't cut it for me, and cows with a small drinker will probably feel the same. It's much better to be able to dunk your face in a big trough and slurp away to your heart's content. Even better if there's also a warm tasty drink full of energy and calcium on offer straight after calving.

4. **Plenty of time**

   Minimise 'waiting' time and maximise lying and feeding times.

5. **Plenty of attention**

   Ketosis, retained placenta and metritis are all more common following twins, so rather than wait to see if these things happen, let's be proactive and check. Even if the cow looks well, let's take her temperature, have a hand in and look for metritis, and take a blood sample to check ketone levels. Any problems brewing can then be identified and treated early to give a better outcome.

Twins are hard work, whether you're a human parent or a bovine one, but they can be very rewarding when the outcome's good!

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