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One of the first practices to come under scrutiny was the flush wash slurry system.

"A cultured sample of the water confirmed that it was clearly contaminated with Johne's bacterium," said Mr Richardson. "And it has, in all probability, contributed to a high environmental challenge from contaminated faeces and may have led to more adult acquired infections in the milking herd. Vehicles used in the flush area, which then drive along the feed areas, is a classic example".

At that time, the calving cows were housed in the dairy shed and their contact with the re-cycled water meant that their flanks and udders ran the risk of becoming contaminated.

"This created the risk of their newborn calves ingesting the infectious agent as they tried to suckle," Mr Richardson pointed out.

The calving cows are now housed and calved in the "non-lactating" building away from the flush wash system.

"We're discussing the flush wash system," said Ian Milne. "Currently it flushes five times a day but we're looking at changing it to three times per day while the cows are being milked, well away from the flushed water".

Regime

A blood testing regime, designed to identify sub-clinical cases prior to calving, has also been introduced.

All cows are individually sampled at drying off, helping to identify cows which are most likely to be shedding.

Cows which test positive (bad) are penned together away from the negatives (good) to avoid the risks of the possibly shedding cows contaminating the calving environment of the negative cows. The positives are not reserved after calving and are culled. Animals

which test positive, but were previously negative, are considered positive.

The over-hang from the previous vaccination programme creates some grey areas when assessing test results. Currently animals that are positive on their first screening, but have been vaccinated against Johne's, are scrutinised carefully and penned with either the positives or negatives, after a range of additional information has been considered.



Farm vet, Graeme Richardson

"Cows vaccinated with the Spanish vaccine are a considerable test result interpretation challenge," said Mr Richardson. "As a result, we're proposing that a third calving group is established to avoid mixing positives with the negative calving group".

Considerable emphasis is placed on the hygiene of the negative calving cows and their environment. They are housed with a low stocking density, in clean, straw-bedded courts, which are regularly mucked out. As cows are drawn into the calving pen, any faecal contamination, particularly around flanks and udder, is removed.

'Snatched'

Calves are "snatched" at birth, ideally before they have had chance to suckle. They are then rubbed down and tube fed as soon as possible with colostrums, either from their dam, or from the frozen store of healthy colostrum, milked from consistently negative testing cows, or a certified Johne's-free commercial preparation.

"We feel that we may have previously spread Johne's through our herd when we pooled colostrums," said Ian Milne. "We stopped this practice in 2005."

"Great care is taken to ensure that the udder is really clean before milking off colostrum for calves," explained Sandy Milne. "By doing this, we reduce the risk of feeding bacteria of any sort to newborn calves".

Heifer calves born to positive cows, plus all bull calves, are sold in batches at three weeks of age to a private customer for finishing. They are penned away from the heifer calves born to negatives, which are retained. Only the sale groups of calves receive waste milk. Retained heifers are fed milk replacer.

The Milne's are doing everything they can to control and reduce Johne's in

A considerable amount of confusion reigns amongst farmers regarding Johne's disease. Yet if farmers are going to control the disease, they first need to understand what Johne's is and how it is spread. SAC veterinary manager, George Caldwell, who manages the SAC Premium Cattle Health Scheme, explained the basics of Johne's, its effects on infected cattle and impact on herd finances to farmers attending the monitor farm open day at Carcary. Claire Powell reports

Good hygiene the key to controlling Johne's disease

Johne's is incurable. It causes wasting in adult cattle which eventually die. In dairy herds, Johne's can cause a variety of problems in infected cows, including reduced yield, infertility, lameness, mastitis and shortened longevity. With an estimated 65% of UK herds infected with Johne's, it is a significant cause of financial loss.

Mr Caldwell believes that a herd with only 2% of clinical Johne's cases could indicate that 25% of the herd is actually infected. At current milk prices, the annual Johne's cost for the whole herd would be approximately £78 per head.

The bacterium which causes Johne's (MAP) is slow growing, very tough, survives in the environment and is resistant to disinfectants. Vaccination cannot prevent nor cure Johne's and can complicate bovine TB tests.

Johne's is spread mainly through faeces, colostrum and milk. Bull semen is also acknowledged as a possible risk.

Animals are infected by ingesting the infectious agent. Adult cattle can be infected but young animals are by far the most susceptible, in particular calves born to infected dams.

"If a cow is infected, there's a high risk that her calf will be too", said Mr Caldwell.

The pooling of colostrum and feeding waste milk to calves increases the risk of spreading infection. But the main spreader of Johne's is faeces.

"Get rid of the muck and keep the environment, particularly for calving cows, as clean as possible," Mr Caldwell advised. "Also ensure water supplies are clean and not contaminated

their herd. Their determination and attention to detail may seem excessive to some, but Sandy Milne believes the battle is being won and the rewards are beginning to materialise.

Herd performance has noticeably improved since the autumn and conception rates are up. Only one live calf has been lost and milk production has improved (overall herd average of cows in milk – 34 litres). Average number of days in milk has increased from around

with faeces. Tipping water troughs make regular cleaning easier".

Slurry spread on future grazing can also pose a risk and silage fertilised with slurry can bring Johne's back into the system.

MAP survives anaerobic digestion but is killed by the higher temperatures of composting.

Johne's is also found in sheep and goats, as well as a wide range of wildlife species, in particular rabbits. SAC recommends that cattle and sheep are not grazed together and that rabbits are controlled.

To establish whether or not a herd is infected, routine blood testing, or individual milk - not bulk tank - testing is recommended, particularly of cows which are not yielding to potential.

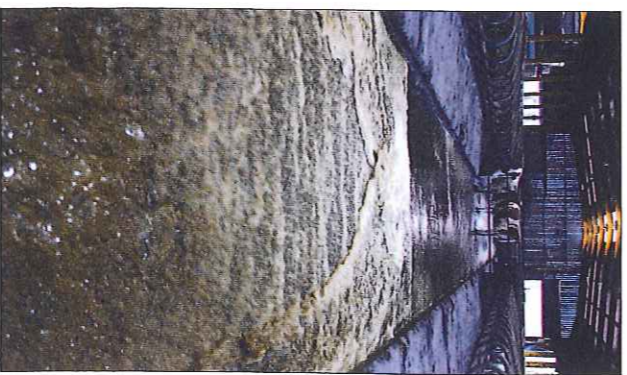
"Infected animals do not test positive in the early stages of the disease," Mr Caldwell explained. "The amount of MAP shed in faeces increases as an animal becomes more clinical. Regular testing is important to identify and remove animals which test positive before they become clinical."



SAC veterinary manager, George Caldwell

175/180 to 195.

The Carcary herd calves year round and within the next few months 60 more calves will be born. Thirty of these will be born to heifers, in-calf to sexed semen, which has previously resulted in almost 100% heifer calves. With luck, these young bovine ladies will be born into a pedigree herd well on its way to becoming the healthy, productive herd the Milne family are working so hard to achieve.



The wash flush slurry system at Carcary

Focus on dairying

Johne's disease was highlighted as one of the major topics for future discussion when father and son, Ian and Sandy Milne, became DairyCo's Central Scotland dairy monitor farmers earlier this year. At the first full monitor farm meeting at the Milne's dairy unit at East Pitforthie, Brechin, veterinary experts from SAC combined with the farm's vet, Graeme Richardson of the Thrums Veterinary Centre, Kirriemuir, to explain how Johne's is spread and how to control the disease. While the meeting concentrated on the Milne's dairy unit, much of the information given is also applicable to beef enterprises, as Claire Powell explains.

Meeting the challenges of Johne's disease at Carcary

The Milne's own two arable farms – the 600 acre Carcary, and seven miles to the north, East Pitforthie, which extends to 650 acres. Each farm used to carry a herd of 110 dairy cows but in August, 2004, the two herds were amalgamated into the closed Carcary pedigree herd of black and red Holsteins at East Pitforthie, accommodated in a brand new dairy complex constructed on a green-field site.

There are two large, light and airy cattle buildings. The dairy shed is home to the in-milk cows which are milked three times a day there is also a 280 x 120 feet building where non-lactating animals are housed.

The milking portion of the herd is housed year round and fed a Total Mixed Ration (TMR) based on home-grown wholecrop wheat and grass silage. In the summer, when the ground is dry, they have access to an outdoor loafing area.

The slurry from the dairy shed is cleared by a flush wash system. It is then separated, with the solids transported to Carcary for use on arable land. The liquid is re-cycled back through the flush wash system.

"Our ambition was - and still is - to run a high health status, high yielding pedigree herd, selling surplus heifers into a premium market," said Sandy Milne, the fourth generation of the Milne family to farm at Carcary.



Cows in the straw-bedded court

"But Johne's Disease has become a major hurdle. We're currently milking 280 cows and aiming to increase to 340, yet our annual replacement rate, at around 30%, makes it difficult for us to achieve our own herd target, let alone



Dairy monitor farmers - father-and-son, Ian and Sandy Milne

have heifers for sale. Johne's, which impacts on so many aspects of herd performance, is a major reason for our high cull rate."

Ironically it seems that the Milne's quest for high health status - the herd is clear of Bovine Viral Diarrhoea (BVD) - has complicated efforts to eradicate Johne's.

"We first discovered we had Johne's five or six years ago when we lost a couple of cows for an unknown reason," explained Ian Milne. "Post mortems revealed Johne's. So we introduced a blood-testing programme and on the recommendation of our then vet, vaccinated all heifer calves against Johne's using a British vaccine."

"A couple of years later, we blood-tested the first batch of heifers we had vaccinated as calves when they were at the point of calving. Every single one

tested positive for Johne's. This was devastating news. But we now understand that their high titres (level of antibody) were probably due to the vaccine and not the disease itself."

When the British Johne's vaccine was discontinued, the Milne's continued vaccinating with a Spanish vaccine but vaccination in the herd ceased in February, 2008.

"We've learnt that the vaccine can neither prevent nor cure Johne's," said Sandy Milne. "It acts to suppress the disease which actually perpetuates its incidence in the herd and makes it even more difficult to establish whether or not the Johne's test results are accurate. We deeply regret having ever used a Johne's vaccine and strongly advise all cattle farmers not to use one"

There are approximately a dozen vaccinated heifers left to calve in the Carcary herd. From then on, all in-coming heifers will be clear of any vaccine-created antibodies and the consequent distortion of blood-test results.

"We will hopefully then be in a more definite world," said Ian Milne.

Working with their current vet, Graeme Richardson from the Thrums Veterinary Centre, Kirriemuir, the Milne's have made herd and farm management changes designed to minimise the risk of infection, particularly of young calves, which are the most susceptible.

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