

Glenkilrie Climate Change Focus Farm meeting



Discussion group meeting held at Glenkilrie, on Wednesday 25th October 2012 at 13.15 by kind permission of David and Morag Houstoun.

Meeting Theme – Maximising Cattle Performance Whilst Minimising Carbon Emissions

Maximising livestock performance will help to improve farm profitability, whilst also reducing the carbon emissions from the farm. Peter Lindsay from the SAC Consulting Perth office is the Farm Facilitator and acted as chair for the meeting. Guest speakers were Dr Jimmy Hyslop, SAC Consulting beef specialist and David Gibson from the SAC Consulting Veterinary Investigation Centre, Perth.

Farmer David Houstoun opened the meeting by giving an overview of the cattle production at Glenkilrie. He runs approximately 70 autumn calving cows and 80 spring calving cows. They are predominantly Limousin cross cows running with Limousin bulls. All calves are sold store. They have been members of the Premium Cattle Health Scheme for 3 years. The biggest health issue affecting the performance of the cattle is Johne's disease.



Johne's Disease

David explained how he has changed his replacement policy in recent years. Through testing, he knew he had a Johne's problem so was buying in his replacement heifers from herds that claimed to be free from the disease. He found that many of these bought in heifers were infected with Johne's when he came to test them and now has moved back to keeping his own replacements again. SRUC Vet David Gibson encouraged buyers of breeding females to query the sellers on their Johne's status. For example a dairy herd might not have a problem with Johne's but the herd life of a dairy cow is 4-5 years so the problem may not be so evident. Do they test lean cows routinely?

On the farm, David now tests annually in November and when the results are back, he separates the positive animals from the rest of the herd. Once the calves are old enough to be weaned the cows are culled. No replacements are kept from animals which have tested positive for Johne's. Cows with Johne's and their offspring are marked to prevent any accidentally joining the main herd again. Three herd tests have been carried out in January 2010, November 2010 and November 2011. These tests have identified 11, 8 and 12 Johne's positive cows respectively. David is concerned that the number has not been

dropping, but David Gibson reassured him that it will take time to eradicate Johne's from the herd.

Vet David Gibson set a challenge for the meeting; he asked participants to look at a group of cows and identify which ones looked like they had tested positive for Johne's disease. His point was that it is not possible to always successfully identify Johne's infected cows visually.



David went on to explain that Johne's is an intestinal disease of cattle (and sheep) that causes damage to specific parts of the gut, preventing normal function. He explained that Johne's disease is a chronic and progressive disease caused by the *Mycobacterium avium* subspecies paratuberculosis (MAP) bacteria. The usual symptoms of the disease are scour, weight loss, swelling under jaw and reduction in milk yield.

Animals test positive to the disease when they are usually 2 years of age and over. However, the test is not as sensitive as it could be and therefore animals need to be tested on regular intervals. Animals which were negative in the past may test positive; false negatives are also possible. When animals are under periods of stress they are more likely to test positive and may test negative when the stress has reduced but they will still be carriers of the bacteria and are likely to be shedding it in their dung and infecting other animals within the herd.

How is Johne's disease spread?

The disease is spread by ingestion of bacteria being shed by an infected animal. There are two routes of infection – horizontal and vertical

- Horizontal = Cow to cow transmission by shedding of bacteria in dung
- Vertical = Dam to calf transmission by shedding of bacteria in dung, colostrum and milk (and in the womb) before, during and after calving

The group questioned if the dung and slurry spread onto the land and then grazed would be a problem. David Gibson replied that the composting process creates enough heat to kill the bacteria in the dung. However slurry provides ideal conditions for the bacteria and therefore grazing land that has just been spread with slurry would cause a risk. If the slurry is put onto silage ground, as is the case at Glenkilrie, then the heat of the summer and the fermentation process in the silage would kill the bacteria.

Housing in winter is a bigger risk than when cattle are grazing. Discussion was given to whether bedding with recycled wood or straw was the better option for Johne's control. The points raised were that woodchip was only bedded once a week maximum and that the bacteria would be on the top but with straw bedding courts the cows eat the straw which may be infected. The conclusion was that as long as they were kept clean either way would be suitable.

It was queried whether Johne's can be transmitted in semen. This is not believed to be the case but care should be taken with infected bulls as they will shed the bacteria in the same way a cow would and can infect other animals in the same way.

What happens after an animal is infected?

Once the bacteria have been ingested they colonise in the intestine and "hide", without causing any damage. This maintains what is called a sub-clinical level of infection.

At an indeterminate point after infection the bacteria will become active, causing damage to the gut which results in the clinical signs of scour and weight loss. This activity may be triggered by a stressful event such as calving and hence animals often become positive after they have first calved.

How can we test for Johne's disease in cattle?

- Microscopic examination of scour for MAP
- Blood testing for antibodies to MAP
- Culture of dung to grow MAP
- PCR test to look for MAP DNA in dung

NB – The sensitivity of these tests is not as good as we would like. This means that it is possible to get "false negative" results. It also means that detecting MAP infection in the sub-clinical phase is very challenging.

How can Johne's disease be controlled / eradicated from a herd?

No treatment is currently available.

- Annual herd screening for antibodies can, over time, help to identify infected animals in the herd. These can then be culled. This process can take several years to achieve a good level of control.
- Removal of the daughters of antibody positive animals can help to improve disease control further.
- Testing of all thin or poorly performing cows / cull cows will also be of benefit.
- Attention to dung management is one of the key factors in control of the disease within a herd.
- Do not use colostrum from bulk tank if possible.
- Replacement policy can have a significant impact. A closed herd is best when seeking to control / eradicate MAP.
- Do not graze cattle and sheep together as sheep are carriers of MAP bacteria
- Control vermin (deer and rabbits) as they may be carriers of MAP bacteria.
- Commitment to the process and viewing it as a long-term project are critical.
- A vaccine is available but this should only be used to reduce prevalence in heavily infected herds.

The group mentioned problems they have heard of relating to the vaccine. It is possible that once vaccinated animals may show positive results to the TB test and they cannot accurately be tested of Johne's disease. David Gibson reinforced that vaccine was only really an option if a herd was severely infected.

Bedding on recycled wood or straw?

David had bought a few loads of recycled wood, as straw may be in short supply. Jimmy Hyslop uses it in the trials facility for many of the cattle. Initially he used it in intake trials to

prevent the animals from eating their bedding but he is increasing the number of animals on it as he thinks it is cheaper than straw and requires less labour. The cost of it at the moment is approximately £18/tonne. Jimmy mentioned that straw would need to be approximately £35/tonne to be of equivalent price. Animals only require to be bedded on it once per week as opposed to 3 times a week as would be the case with straw. The group mentioned that animals bedded on it were cleaner than straw and fat cattle require no belly clipping.

At present, there has not been enough use of it to know how well it will break down and what it will be like when spread on grassland or ploughed down. There is unknown content and it often contains plastic. The group mentioned that they would not like to calve cows on it although one member had done so with no detrimental effects. At the moment the price for the recycled wood is relatively low but as the demand for it, as with all wood, increased the price may no longer make it a viable choice.

Calving at 2 or 3 years of age?

There has been much discussion whether to calve at 2 years old or three years old. David had tested this at Glenkilrie and had 6 cows in a pen showing 3 that had calved at 2 years old and 3 that had calved at 3 years old. Although the ones which had calves at 2 were smaller, they were younger cows and the calves which they were rearing were of similar size to those who had 1st calved at 3 years old.



Jimmy Hyslop mentioned that there is no reason why calving at 2 would not work, even in native breeds as they should be more fertile. However, the calves do need to be well looked after from birth. Bulling at 14 - 15 months of age the heifers should be 65% of mature live weight. Mature live

weight is approximately 60-80kg heavier than the herd average. They should not undergo a store period as calves but be pushed to achieve this weight. Care should be given to creep them as calves to reduce the weaning check. Vaccinations will ensure that they are of optimum health and will help to maintain growth rates. Heifers calving at 2 also need to be well looked after in their 1st lactation as they are still growing, trying to feed a calf and have to get back in calf themselves. It is possibly a good idea to wean heifers' calves a few weeks earlier than the rest of the herd to give them longer to recover.

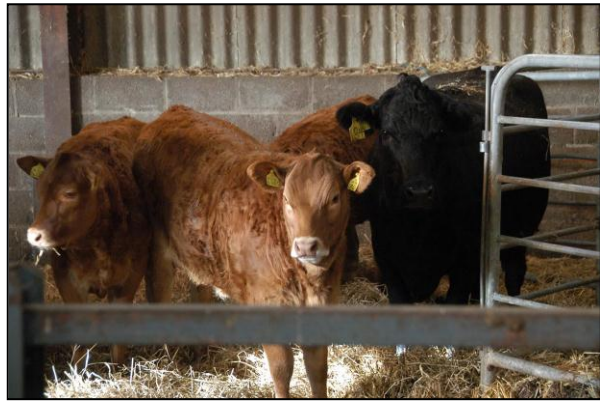
Benefits of calving at 2 years:

- It costs **£300 - £400 per annum to keep a cow**; an extra cost before return on money
- Cows do not last longer if calved for the first time at 3 years old, so you are getting **more production** out of lifetime of cow
- If they do not get in calf they are still under 24 months of age and can be sold fat without the penalty for older cattle exceeding 30 months of age
- Often more calving difficulties in calving at 3 as they are over fat

- Less management groups

Negatives of calving at 2years:

- Need to ensure good LWG from birth
- Extra concentrates in 1st lactation
- Issues getting back in calf
- Cows possibly slightly lighter
- Must get management right
- Use easy calving bull in 1st year



Grassland sequestration of carbon and Greenhouse Gas emissions in Scotland's beef and sheep production systems

Dr Jimmy Hyslop, SRUC noted how greenhouse gas (GHG) emissions; principally methane (CH₄) and nitrous oxide (N₂O) are now regarded as one of the major sources of emissions associated with beef and lamb production systems. At a farm scale level, several "carbon footprint" calculators are now available to estimate the tonnes of CO₂ equivalents (t CO₂e) produced for each enterprise with the results usually being expressed per tonne of food product output (e.g. per tonne of beef or lamb carcass).



However, Jimmy noted that current carbon footprinting protocols don't take into account how much carbon is locked up in grass growth on the farm. Whilst it is widely known that grassland does sequester carbon (i.e. remove CO₂ from the atmosphere and store it as well as emitting CO₂), no assessment of this is undertaken as there are no accepted mechanisms available to test this on working farms. As these carbon footprint assessments develop, the time seems right to investigate to what extent farming systems could be assessed and baselines established that seek to acknowledge the important role that grassland can make towards carbon sequestration.

QMS have commissioned SRUC to gather data and background information on suckler beef and sheep systems typical of those found on progressive Scottish livestock farms. Jimmy explained some of these data from 21 farms across Scotland that were used in the calculations to provide a standard "carbon footprint" for both beef and sheep production systems.



Jimmy stated that on a European wide basis, a new technique of estimating carbon sequestration potential is currently being investigated and initial studies suggest that carbon may be accumulating at an average rate of 1.04 t of per ha (range -2.26 – 4.62) across a European transect of nine grassland sites. Whilst the methodology remains to be tested and this figure for carbon sequestration potential is still to be validated; it is widely accepted that soils growing Scotland's grassland may be capable of sequestering **at least a part** of its livestock based GHG emissions.

Making full Use of Fixed Costs

Jimmy finished the day by mentioning that it is a good idea to look and see if it is possible to get **more productivity with the same fixed costs**. For example having 100 spring calving cows whose offspring are finished at 24 months requires the same housing as housing 140 autumn calving cows with the calves sold at 12-14 months of age.

David Houstoun went on to mention that Peter Lindsay had done rations which showed that it was cheaper per kg to push the cattle to 1kg/day compared to 0.75kg which also reduces straw etc.

In summary, Glenkilrie has a lower carbon footprint than in terms of similar farms. It is these type of practical efficiencies which result in good use of the fixed costs as well as good stock management which benefits the farm and enables a reduction in greenhouse gas emissions.

Peter wrapped up the meeting by thanking Jimmy Hyslop, David Gibson and David and Morag Houstoun and everyone for coming.

Further information was provided at the meeting, including the following practical guides and technical notes:

- Carbon footprinting on a beef farm
www.sruc.ac.uk/downloads/file/140/practical_guide-carbon_footprinting-beef
- Livestock nutrition
www.sruc.ac.uk/downloads/file/138/practical_guide-livestock_nutrition
- Case Study; Upland Livestock Farming
www.sruc.ac.uk/downloads/file/645/case_study-upland_livestock_farming
- SAC Technical Note; Johne's disease in cattle
www.sruc.ac.uk/downloads/download/314/tn501_johne_s_disease_in_cattle

Do you farm and would you like to attend to future meetings?

The meetings provide sensible ideas for the farm business, from invited speakers and other farmers, to improve efficiency which in turn reduces emissions. It's free to come along and you will be able to influence the topics, speakers and location of future meetings.

Contact Peter Lindsay for details of the next Glenkilrie event at peter.lindsay@sac.co.uk or telephone SAC Consulting in the Perth office on 01738 636611.

If you want to keep up to speed with what's happening at Glenkilrie but don't want to attend all the meetings, ask to be added to the Glenkilrie email list; you will receive notification of future event and meeting notes.

Visit the website at www.farmingforabetterclimate.org or email a general enquiry to climatechange@sac.co.uk or follow us on Twitter [@sacFarm4Climate](https://twitter.com/sacFarm4Climate)

