Balancing the ‘5 principles’ in the calf shed

The first part of the farm that was visited was the calf shed. Here the 5 principles were discussed.

Moisture / hygiene – there is a great temptation to wash floors around calf pens to keep them clean. However, this water then takes heat out of the air when evaporating. This can raise the lower critical temperature causing severely reduced growth.

Temperature - New born calves require 15°C to allow them to perform at an optimum. There are very few days in the year where this temperature is achieved all day. Jamie is therefore a big fan of using jackets on calves, or using quartz heaters fitted to a thermostat as these are both good ways to keep calves warm.

Fresh air / air speed - Getting fresh air to calves, without causing a draft can be difficult. Calves need 0.04m² of air outflow and twice as much space to allow air in per calf. The siting of this inflow is just as important. The calf shed had enough inlet space, however because it was from a door on either end it created a wind tunnel, with some calves getting a draft, whilst others were situated in stale air pockets. The use of a fan and air tube would help this problem. The holes should be situated that the air runs out of velocity just at the calf’s nose so as not to give them a chill.

Jamie strongly advised having a period of the year where the calf shed will be empty for a thorough clean. If stopping calving is not possible then building a small shelter in a field using hestan bales of straw and some tin sheets for a roof would also work. He advised doing this in the summer for at least a week to allow the shed to rest.
Cow accommodation adaptations

The next stop on the farm tour was the cow shed. A great deal of work has taken place in the cubicle shed over time to improve cow welfare. Walls in front of the cubicles have been removed to allow more lunging space. The cubicles have been changed to plastic cubicles, giving cows greater comfort when moving in the shed.

After replacing the solid floors with slats the Love family bought a scraping robot. This has helped to reduce sawdust use by 1/3, reducing the SCC from 169 to 112 and dropping the bacto-scan results from 36 to 21.

Finally rubber matting was installed in the collecting area and parlour as the concrete groves had worn away. Not only has this improved the welfare of the herd, it has sped up the milking time as cows are more confident walking on the rubber. Parlour training heifers has also improved significantly.

The first area that Jamie saw where big improvements could be made was the ventilation. Dairy cattle require $0.2m^2$ of inlet per animal for air and $0.1m^2$ for outlet on the top. Currently the sides of the shed are sheeted with no inlet for air. Removing these sheets and having 25% of the space open i.e. space boarding using 6 inch (152mm) boards with a 2 inch (51mm) gap between them, would allow sufficient air inlet. The ridge has a very small gap; opening this to 300mm would allow a much better flow of air. One concern when doing this is that rain will enter the shed. The heat generated from the cows will stop a significant amount of rain entering. Jamie suggested trying this in the middle two bays of the shed to observe if this was the case.

Additional benefits to ridge removal

Opening the ridge and sides would also allow more light into the shed, another area that could be improved. The ideal light levels for lactating dairy cows is 200 lux for 16 hours per day. Inside the shed, the majority of the light levels were only at 50 lux; outside the shed at this point was 800 lux.

There is a big potential to improve natural lighting in the shed. However, gaining 16 hours of natural light as the optimal level of 200 lux is not possible year round, so artificial lighting is required. Fitting LED lights into the shed would have a big impact of milk yield and fertility, and in some cases can pay for themselves within year.
The last shed that was visited was the calving shed. At Muirhouse this is a former hayshed, clad on 3 sides with an open front. The question of fresh air was raised. Since the shed has a closed ridge, there is no difference in pressure to draw in air and so the air at the back of the shed can be stale, despite a large open front. Jamie encouraged farmers to go to the back of their sheds to make sure the air was clean, and if not look at the possibility of using space boarding on the sides to allow some airflow.

The temperature requirement of the two animals in the shed – the cow and her calf – is another area where farms could improve welfare.

New born calves require a far higher temperature than cows, so Jamie suggested treating them like piglets or lambs, giving them a separate area under a heat lamp. Using a cut down IBC would also mean a clean space for the calf, reducing the risk of infections that could be picked up in the calving pens.

Key Points for every farm

- For calves under 3 weeks old, 15°C is the critical temperature - below this and calves need to burn energy to keep warm, reducing growth rates.
- Consider using calf jackets on all young calves when the temperature drops below 15°C. This can be routine practice or smaller or weaker calves
- Bedding should be clean and dry - test using the knee test - drop to your knees inside the bedded area. Your legs should be dry. Keeping bedding dry not only improves hygiene in the pen but also keeps the calf warm.
- Igloos are an ideal housing solution for youngstock. The design funnels the wind over the vents on the top, creating a stack effect and drawing fresh air into the structure, maintaining a drier, healthier environment.
- A 650kg cow can produce ~10 litres of moisture by respiration alone; in a 100 cow herd this equates to 1000 litres per day before considering excrement and rainfall.
- Dry bedding for adult cattle is as important for bacterial and virus control as with youngstock. Adequate airflow can help keep bedding drier for longer, which will reduce input costs.
- If using space boarding allow no more than 1”/25mm between boards - rain can enter the shed through a gap any larger than this and increase shed humidity.

Practical Guides
For more information on how to improve shed ventilation in your sheds, or how to adapt your farm buildings to a changing climate, see our Practical Guides on the ‘Downloads’ section on our website: www.farmingforabetterclimate.org/download
How can Woodhead benefit?

Calf housing
This is an area that John has already addressed at Woodhead. Availability of calf accommodation had previously restricted John’s ability to rear his own replacements on farm. Instead he had them contract reared off farm.

During 2015, two igloos were installed at the farm. They are located in an area where calves can have shelter from the igloo but outdoor access under a roofed pen. The igloos allow for two batches of 14 calves, allowing John to rear his heifers at home where he has better control over their daily liveweight gain. The calves have responded well to this accommodation; cases of pneumonia and scour have reduced with and improvement in daily liveweight growth rates have helped to maintain a calving down age of 2 years. These outcomes help to reduce the carbon output due to the improved efficiencies of production both as calves and during their time within the milking herd.

Since John runs a split block calving pattern, ensuring heifers calve down by 2 years is vital to maintaining an efficient system. Any heifer not at weight at the time of service will then need to be held back for a further six months to join the next calving block, thereby reducing production efficiency which is detrimental to the carbon outputs.

Improving airflow in the cubicle shed
At Woodhead the cubicle shed is a typical 1970s style concrete frame with cladding on the sides and a capped ridge. It houses 180 diary cows with insufficient airflow. Additionally the shed is quite dark due to the cladding restricting the natural light entry, resulting in a necessity to use electric lighting during the day.

It has been recommended that John addresses these issues by increasing the air inlet at the cladding and investigating the logistics of adapting the ridge in order to improve the stack effect to improve airflow.

Meetings are free to attend and all farmers are welcome.
For Woodhead, contact farm facilitator Robert Ramsay on 01292 525 252 or via email on robert.ramsay@sac.co.uk for more information.

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