



The distance between the purlins at the ridge will determine the width of the ridge. The ridge can be retrofitted, though this is a more expensive route. Ball park figures are £140-190/m depending on the width and span, which can range from 1.5m to 4.0m.

Getting ventilation right:

Don't get hot and bothered

When temperatures in a building rise beyond 20°C, milk yields can drop. While this clearly isn't an issue for cows out on summer/autumn grass, it is a concern for those herds kept indoors

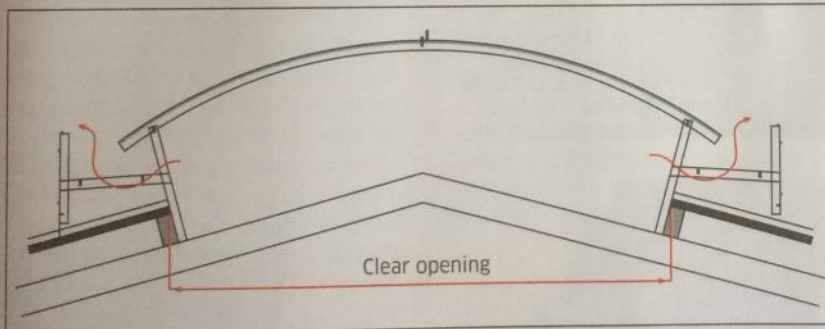
Mervyn Bailey

Cow building design is changing as more dairy herds are kept indoors all year round. The reality is that while vent sheets and Yorkshire boarding may be just the ticket for smaller herds only housed in winter, cows inside for all 12 months is a different kettle of fish. Paul Butland, of Intershape, says that the wet summer of 2012 was a turning point for many herds, forcing farmers to bring their cows indoors rather than poach pasture,

and at the same time they were also able to better manage dry matter intakes and boost yields. Even so, this practice was not without its own problems. The main issue was rising summer temperatures in buildings designed to keep stock warm in winter months. "For the past 15 years we have been selling calf hutches – to get calves out of buildings, overcome pneumonia and improve the general well-being of the calf," he explains. "With this in mind we looked at countries



Intershape's demo light ridge has an opaque panel on the left and a clear one on the right. The former acts less like a greenhouse, but it still makes the most of any natural light.



The light ridge works the same as any other raised ridge, sitting higher than the roof; air from the building is drawn out. Ridge height will depend on stocking rate and building size.

with extreme temperatures. Canada is warm in the summer with 35-40°C and then horrendously cold in the winter, so they close up the building for winter and open it during the summer. We might not get these temperatures in the UK, but it was interesting to look at the toolbox of options they use and create a package."

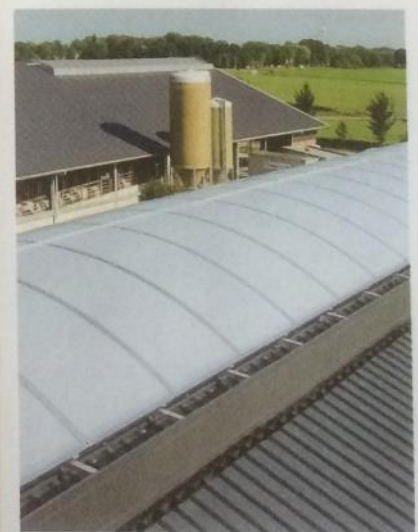
Air in, air out and air movement are the areas that need to be observed, with automatic climate-controlled curtains being just one part of the solution. There are several variations on the market; Intershape sells Airkoe's curtain range from Holland. The other area to look at is the ridge cap.

While there are several types, one that is starting to appear on more UK buildings is the light ridge, which replaces traditional tin or fibre cement cladding with polycarbonate clear sheet. This allows in more natural light to further reduce electricity bills.

Mr Butland points out that clear sheeting in a roof can act like a greenhouse and actually increase the temperature in the building, something that needs to be avoided during the hot summer months. The benefit of the polycarbonate is that it can be offered in an opaque finish that still lets in the light but reduces the 'greenhouse effect'.

Airkoe makes two types of ridge cap for

portal frame buildings. A saddle ridge mirrors the shape of the roof with a central peak, while the curved ridge is what it says on the tin. Both do exactly the same job, the only difference being their aesthetics.



A vertical panel runs the full length of the ridge. This has bristles along the bottom that follow the contours on the corrugated cladding to stop rain water blowing in. The baffles prevent wind blowing up the roof and thus reduce the impact on internal air flow.

Case study: Myremill Farm, Maybole, South Ayrshire

The Lawrie family purchased Myremill Farm in Maybole, South Ayrshire, to establish a second dairy herd. The decision was made to level a number of the older sandstone buildings and erect new dairy and calf housing. Kevin Lawrie says the family considered several parlour options for the 220+ milkers at its new unit.

While pondering whether to go for robots or install a rapid-exit milking parlour, Mr Lawrie checked out various set-ups in Holland and Germany as well as closer to home. This research time allowed him to add some more ideas to the wish list and come up with a plan that he then talked through with Robert Veitch, of VE Tech, who did the design and building work.

The decision was made to put in a 30:30 Gea Technologies rapid-exit milking parlour as this meant the cows could be milked in



Kevin Lawrie says the family farm looked at several options for its new dairy unit including robots. In the end the Lawries decided to go with a new Gea Technologies 30:30 rapid-exit parlour.



The 3.0m wide curved Airkoe light ridge was fitted to the 260-cubicle, 79m long, 39m wide building.

around two hours and attention could then turn to other jobs including the 240ha of arable, whereas Kevin felt someone always had to be on hand with the robots. The other Lawrie farm also has a rapid-exit parlour. "Yes, you will have units just hanging there at times, but, if there is a slow cow still milking, the other side is still being milked," he points out.

The 79m long, 39m wide building accommodates 260 cubicles, the milking parlour, handling area and calving pens, or at least it will do by later this year when the building work



Airkoe automatic curtain system has been fitted to one side of the shed, allowing control of the temperature during winter.

is complete. A slightly narrower 9.3m long building sits at the front to house the 12,000-litre bulk tank, machine room and office. Temperatures at the farm tend to hover around 8-10°C, reaching a maximum of 18-20°C during summer and dipping as low as minus 4-5°C in winter. Mr Lawrie says this relatively constant temperature is the main reason why he only fitted the automatic curtain system to one side of the shed, which measures 5.5m to the eaves with a low wall to deliver maximum air flow.

"When it gets really windy we can simply raise the curtain and the cows will be fine," notes Mr Lawrie.

The wet, windy climate was also the reason behind covering the feed passages rather than having a lower cost overhang. The cows are fed a mixed ration mainly consisting of grass silage, wholecrop, Maxammon-treated barley and a protein blend with feed-to-yield in the parlour.

Having seen various light ridges on the farms he visited, Mr Lawrie was keen to include these on his new building. Mr Veitch recommended fitting the Airkoe system



Veitch-designed cubicles and the cranked neck rail are made by IAE. Rather than fitting a brisket board, a stepped concrete central section was used at Myremill.

A central water store relies on a gravity system to fill the troughs. Slide-out tubing behind the wall creates easy-to-store/-use barriers for guiding stock.



from Intershape. In fact this is the first unit in the UK with both the ridge and curtain system on the same building. The light ridge spans about 3.0m and runs pretty much the full length of the building, which has a 20° roof pitch. Wanting to make the most of the natural light, additional roof lights were also incorporated.

High pressure sodium lamps from Agrilight supply artificial light. The sodium bulbs provide general illumination, while secondary red lighting enables night checks to be made without unduly disturbing the stock.

Other points of note at Myremill are that the cow area is suspended over a 3.0m deep tank, and that high-grip slats were again specified after proving themselves on the other Lawrie farm, which benefited from its own new cow unit six years ago.



Rubber paint has been applied to all the walls in the handling area to make cleaning easier. More costly Duraflake resin was used in the parlour pit and dairy.

Summary: A cow's temperature increases by 0.5°C/min when lying. When her body temperature eventually reaches 38.9°C she will have to stand up to cool down – but even then she will only cool down at a rate of 0.26°C/min. She won't lie down again until her body temperature drops to 37.7°C according to vet Sara Pedersen, who takes a special interest in lameness prevention. Less lying time equates to less milk, so it is clearly important to be able to control the

temperature of a building, and ventilation is the tool to achieve this.

Even though the Myremill Farm herd is not currently housed during the summer the capability to alter the temperature during winter is seen as a key part of the overall building design. In addition, despite the light ridge probably providing sufficient light, additional clear sheets are included in the roof space to promote better bulling. All in all, it certainly feels a pleasant place to work.

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