

Partneriaeth y Wern Partnership LLP

Unit 11,
Lon Parcwr Industrial Estate,
Ruthin, Denbighshire
LL15 1NJ
Tel: 01824 703066
www.wernvets.co.uk
VAT Reg No: 159 2525 51



REF. P/2018/0685 - East View Farm, Cobblers Lane, Burton

16/11/2018

To whom it may concern,

I have been asked by Mr Richard Knowles for an assessment of the size and layout of the shed which has been submitted. I have been asked to comment on animal welfare implications of a poorly designed shed. I am a large animal vet that has regular contact with the herd in Honkley farm. I am often involved in advising our other clients on the design and layout of their buildings in order to give the cow the best possible opportunity to perform at peak efficiency which goes hand in hand with the highest welfare standards. It has been a mistake over many years to underestimate the space and comfort requirements of a modern dairy cow this has led to major inefficiencies as well as needless and preventable welfare problems on numerous dairy farms.

From your correspondence I can see that from a planning point of view you there is an issue with the size of the shed and also the height of the shed. I will try to explain need for a shed of these dimensions. The devil in these sheds are in the detail therefore to justify the overall size of the shed we have to look at individual components within the shed. I have tried to draw a sketch of the shed in order to clarify my explanations.

The majority of the dimensions quoted are from AHDB Guide to dairy housing. Please refer to diagram 1 for a schematic drawing.

Shed Length

The length of the shed is determined by the width of the cubicle and the number of cubicles that we would need to fit into the shed. The minimum cubicle width I recommend for Holstein Friesian cows would be 1.2m wide. Ideally for housed herds indoors all the time there are significant welfare benefits in a cubicle that is 1.27m. In this shed we would then be able to fit 53 cubicles into its length. As you can see in diagram 1 Mr Knowles is planning a three row shed system which would put a total of 121 cubicles to each feed fence this would give a total of 242 Cubicles in the building.

Shed width

The width of the shed is determined by numerous factors

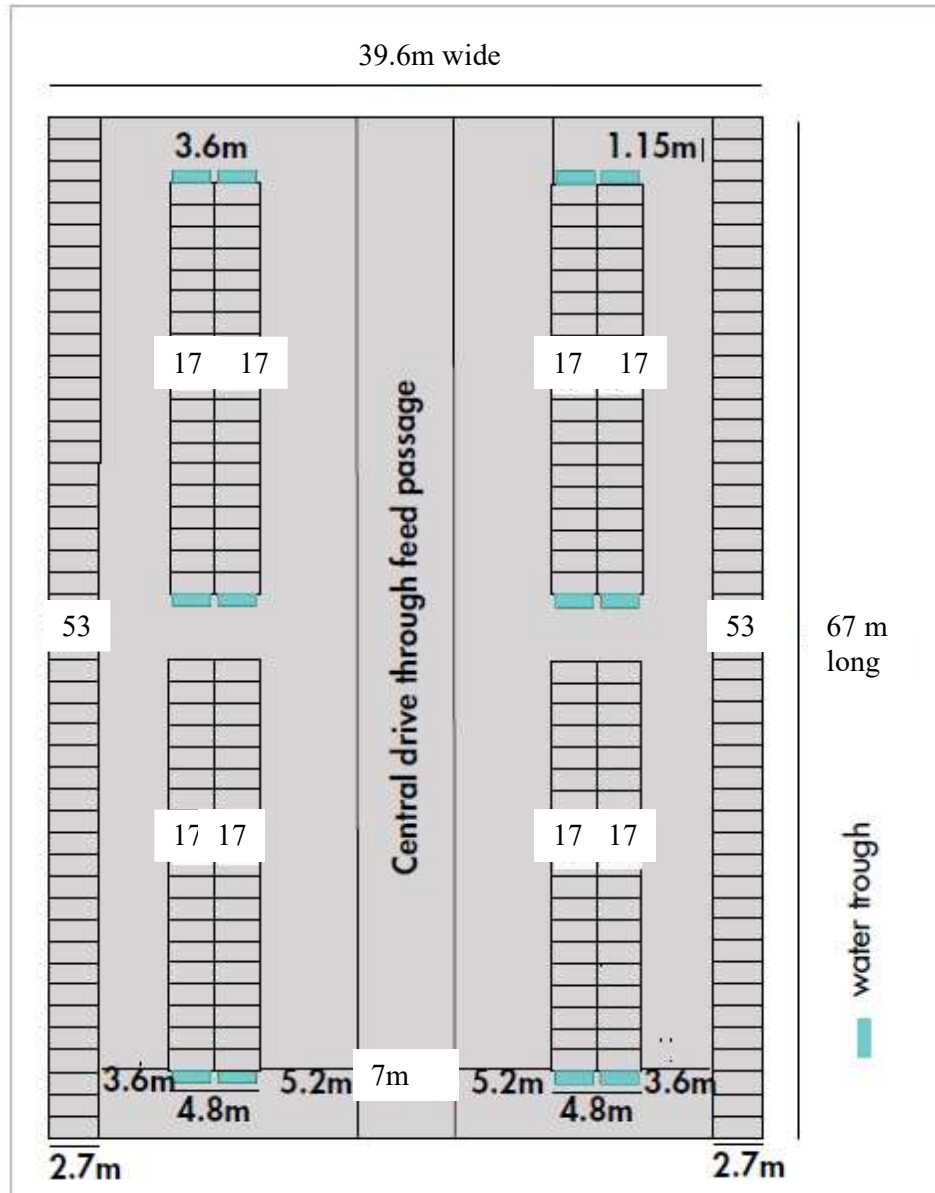
1. The length of the cubicles
2. The width of the passages
3. The width of the central feed passage.

Partneriaeth y Wern Partnership LLP

Unit II,
Lon Parcwr Industrial Estate,
Ruthin, Denbighshire
LL15 1NJ
Tel: 01824 703066
www.wernvets.co.uk
VAT Reg No: I59 2525 51



Diagram 1. Schematic drawing of a recommended layout for this shed.



- (1) Cubicle length is dependant on the type of cubicle that is put in so a single row against the wall the minimum would be 2.7m a double row requires 4.8m .
- (2) Passageways in this design are designed to AHDB standards ie wide enough for cows to pass without causing conflict between cows and wide enough to keep slurry deapth to a minimum so that

Partneriaeth y Wern Partnership LLP

Unit II,
Lon Parcwr Industrial Estate,
Ruthin, Denbighshire
LL15 1NJ
Tel: 01824 703066
www.wernvets.co.uk
VAT Reg No: 159 2525 51



cattle can be kept clean. A reduction in conflict and slurry will help reduce lameness a major welfare problem on dairy farms. Cleaner cows will result in fewer cases of mastitis.

- (3) The width of the central feed passage. The central feed passage needs to be wide enough for large modern tractors and the feed wagon to operate in safely. There are alternatives to a central feed passage. That is to remove it completely and feed along the outside of the shed. This should not be an option on this farm and I would strongly advise against this. At this site as they have had previous problems with Bovine TB The area is considered to be a TB hotspot. Government guidelines recommend that access to cattle feed by badgers should be prevented. Badger proofing this shed would be possible with the shed in its current design layout and very difficult if we open up the shed and feed along the outside.

This shed has a total of 242 cubicles. This equates to a maximum capacity of 230 cows. Best practice recommends that we should aim for 95% occupancy. A further factor that we need to consider when designing a shed is the feed space for each cow. This shed in its current size will likely be able to hold 223 cows giving each cow the recommended 0.6m per cow at the feed fence. Keeping the stocking density at this level will lead to boosting welfare and production from the shed. I would be very worried for the welfare of the animals kept in the shed if we start reducing the size of the shed. My main concerns would be an increase in avoidable lameness cases due to cattle standing for longer periods of time and fighting to feed. We usually see a greater incidence of digestive upsets due to cows not having enough feed space to eat in a natural way.

Issue 2 The height of the shed.

The requirements for ventilation within an animal building are.

- Air circulation, dust levels, temperature, relative humidity and gas concentrations must be kept within limits which are not harmful to the animals
- All new buildings should be designed with the animals' comfort in mind, with the aim of preventing respiratory diseases. The buildings should provide enough ventilation throughout the year for the type, size and number of stock to be housed in them

Natural ventilation of sheds is by far the least troublesome and cheapest way to ensure that cows are able to breathe fresh air for the majority of time.

In the UK for the majority of time, there is sufficient generating force from wind to provide the necessary air changes within a building by natural ventilation. For the remaining time, the building relies on the stack effect to replace foul air with fresh air.

Heat produced by the livestock naturally rises. If it is unable to exhaust from the building at the highest point (at the ridge), it will condense and remain within the building, causing humidity to increase. As the air cools, it will fall back onto the bedding, increasing the moisture content and creating a suitable environment for bacteria to thrive.

Partneriaeth y Wern Partnership LLP

Unit II,
Lon Parcwr Industrial Estate,
Ruthin, Denbighshire
LL15 1NJ
Tel: 01824 703066
www.wernvets.co.uk
VAT Reg No: I59 2525 51



If the warm air is able to exhaust from the ridge of the building, this draws fresh air into the building through the side inlets, ie the 'stack effect'. However, if there are insufficient air inlets, warm air cannot escape from the building as a vacuum effect will not be created.

This building is designed to take full advantage of natural ventilation and the stack effect with adequate inlets and outlets.

The roof pitch in this case is giving us an issue as it is at a higher pitch than we see on the rest of the buildings at Honkley this makes the increases the overall ridge height.

Roof slope affects the performance of a naturally ventilated building. A proper roof slope enhances air mixing within the building and the ventilation rate through the building. This pitch gives a 6:12(rise:run). A shallow roof slope (less than 3:12) will reduce the overall height of the building but also restrict air movement due to buoyancy forces. This results in stagnant air spaces, reduced ventilation rate, and increased moisture, heat, gas, and odor accumulation. This is a particular problem during the summer months

This is moderately wide shed, it becomes increasingly difficult to ventilate sheds that are wider than 27m. Natural ventilation would be further compromised if a shallow pitch is opted for.

A higher pitched roof is of greater importance during the summer months to prevent heat stress in cows. This condition has welfare implications due to higher rates mastitis, lameness and respiratory disease and sometimes can lead to death in affected cattle. The solar gain from a steeper pitch is a lot less than it is for a shallow pitch roof therefore resulting in a cooler shed.

If sheds are not designed to ventilate properly we often have to advise that additional mechanical ventilation is used to move air around in a shed. This increases the energy requirements and the cost of running a shed and never compensates for a good design and build initially.

Having looked at the plans for this shed it looks as if Mr Knowles has designed it in order to maximize cow health and welfare giving the cows adequate floor space to maximize welfare and therefore production. Increasing the pitch to above the standard pitch seen on other agricultural buildings does increase the overall height of the building but gives us the best chance to give these cows the optimal environment in which to perform and remain healthy.

If I can assist further in this case please do not hesitate in contacting me

Yours truly

Dyfrig Williams BVSc MRCVS