

Building need – Animal Health & Welfare

The current cattle accommodation at Blackmoss Farm is in excess of 30 years old. When it was constructed, it was built with existing knowledge of the age.

Over the last 30 years, knowledge regarding dairy cow accommodation and its effect on dairy cow health and welfare has increased significantly, principally via global knowledge transfer.

The proposal is to construct a purpose built dairy to the highest possible standards of dairy cow welfare and husbandry to promote cow longevity, through excellent fertility, feet and comfort.

In current order, the main reasons why a dairy cow leaves its herd are Fertility, Mastitis and Feet and Legs and these 3 reasons account for over 50% of the reasons why dairy cows exit a herd.

The proposal aims to promote the highest standards and potential measures of all three of the main dairy cow health and well-being indicators, by creating a building as close to “pasture conditions” on the “best day of the year” with all the benefits of being housed during the middle of winter by promoting and excelling the 5 freedoms, all animals deserve.

PROPOSED BUILDING DESIGN

The building structure has been designed with a relatively low double roof with a 22-degree pitch to maximize the chimney stack effect that will promote maximum air exchange throughout the day and night.

Automatic side curtains controlled by a weather station will allow maximum air entry into the building and the cantilever roof will allow excellent air exit to exchange clean air through the building to promote excellent ventilation.



A traditional “yorkshire boarded” building is illustrated below as a comparison.



The cubicle dimensions are determined through extensive trials which have provided the correct lying position for a mature dairy cow as shown in an example below.



A dairy cow should lie straight in a cubicle bed so it does not “soil” its own bed, keeping it clean and the challenge of mastitis, kept to a minimum. The dimensions also make it as easy as possible to get up and down from its 42mm super comfort mattresses. A smooth cover is needed to stop any potential “hock damage” from the abrasive nature of the bedding.

It takes 52 individual movements for a cow to get up. At least 1 meter of lunging room is required as well as no obstructions to allow those movements and make sure the cow will lie straight in her bed.

Cow comfort is critical to promote greatest “lying time”. We can measure lying time by use of technology, (pedometer) and we wish a cow to lie in its cubicle bed for more than 13 hours per day.

A speedy milking, sufficient feeding area, loafing room, good air exchange and a comfortable bed all promote increased lying time. A dairy cow synthesizes twice as much milk lying down as it does standing up.

The correct lying position of a dairy cow in a dry, clean bed shown some 12 hours after the building was last cleaned. The top rail is set at 208mm and 132mm so as not to impeded the cow with a brisket board set at 173mm, the measurement of a cow from its dewlap to its tail.

The cubicle is set at 1.2M wide as the above cubicles are. A large mature dairy cow will use all of the cubicle and narrow cubicles can result in “trodden” teats

It is proposed that the “scrape” passageways will be “slatted” as shown below.



Whilst being expensive to construct, this stops the build-up of manure within the building as it falls by gravity to the storage channel below, away from the cow.

Slats keep dairy cows much cleaner, (as above) in particular the cows' feet and eliminates a painful condition called digital dermatitis.

The rubber covers stop potential white line disease seen on concrete and traditional slatted floors.

With daily footbaths and three pedicures per annum, lameness in dairy cattle can be kept to a minimum.

The slats also greatly reduce the amount of ammonia produced by the building a key consideration in building design.

In this situation, this proposal is a replacement so a net gain will be produced.

The proposal is for 2 rows of cubicle bed, facing head-to-head to promote animal comfort as discussed previously. By having 2 rows rather than 3 rows we can promote greater intake of feed and increased lying times as cows have to spend less time feeding or intending to feed.

This provides 700mm of feed space per cow.

There is a defined pecking order within any dairy herd and the "boss" cow will always eat first and a young heifer as the lower end of the pecking order will eat last. We need to take away the bottle necks of a pecking order by having enough feed space, no dead ends with the building, (so heifers can escape the advances of a "bully" cow) and sufficient loafing and cubicle space.

The building overall offers a space of 12M² per cow which is well in excess of the industry average.

Conclusion

The overall design is multifaceted but with one clear aim.

Look after the cow and she will look after you.

The longer a cow lasts within the dairy herd the greater the profitability of the dairy herd.

Cow fertility, good feet/locomotion and the reduced incidence of mastitis being key drivers to this.

The current cull rate within the "national" herd is over 35% per annum and this facility can achieve sub 15% per annum.

This also represents significant reduction in the unit's carbon footprint as less replacements are required, (240 less heifers on farm) and healthy cows are more efficient than unhealthy cows.

The unit has targeted a carbon footprint of 850grams per KG of milk sold. The national average is over 1,200 grams per KG of milk sold.

This unit could set new targets on dairy cow health and well-being, demonstrating what is possible for the dairy industry.