# Management of dairy cow cubicles: challenges and solutions for design

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**Kumar Sivam** explains how poor cubicle system design can contribute to disease, among other problems, and discusses how to manage these issues

## Summary

I see cubicle systems that range from the good, the bad to the ugly every day in dairy practice. The challenges faced in cubicles stem from two areas: their design, relative to the needs of the cows, and their management.

Poor cubicles contribute to a range of production diseases, such as mastitis and lameness. The most common problem is that the cows are too large for their cubicles. This leads to cows refusing to use cubicles, standing up for too long and injuring themselves when they lie down.

As a vet, it is entirely practical to get involved in looking at the origin of cubicle problems and to use a simple methodology to highlight problems and identify solutions.

One such methodology is outlined, and an example of its use is provided in the article. The case study illustrates the benefits we can bring about, as well as the importance of taking an iterative and long-term view.

It need not be difficult to manage a cubicle system well. The article shows some good housing with contented cows. Cubicle systems can work really well, providing the comfort and security the cows deserve.

**Key words**

cubicles, comfort, bedding, dairy

**SINCE the 1960s, cubicles have become the most common form of housing dairy cattle. Cubicle systems can work really well, providing the comfort and security the cows deserve.**

Unfortunately, this is not always the case. Dairy farming has changed, leading to higheryielding, larger cows that often have to fit into cubicles meant for their much smaller predecessors. Fewer people are working on farms, and it can be difficult to pay attention to all the aspects of husbandry that one would like to. Figures 1, 2 and 3 illustrate some aspects of poor repair and under-sized cubicles that are encountered.

The inadequacy of some cubicles leads to specific problems and, more importantly, makes an unquantifiable contribution to many disease syndromes. In other words, we cannot be confident, in any given situation, how much improving the cubicle design and management could alleviate problems such as lameness and mastitis.

Of course, we have to deal with the situation we are given. It's not useful to merely blame an old-fashioned cubicle house and wish for a new cubicle house, which we dream will sort out our problems.

This brings us to simple changes that can have a real and positive impact. I have detailed one such case later in this article.

Before that, I want to look at some common problems. For a more complete coverage of cubicle design, I recommend DairyCo's *Housing the 21st Century Dairy Cow – a Review for MDC*and *Cubicles – Housing Dairy Cattle*, as well as Kingshay's technical documents. See further reading for website links.

A common issue is that of cows not lying in cubicles properly (Figure 4). The sequelae are several. The risk of mastitis in the cow pictured is significant, given the contact between her open teat end and the dirt in the passageway. In addition, the cow is unlikely to be comfortable, so reducing lying times has knockon effects to milk yield, lameness and fertility. Direct physical injury is also a risk, most notably on the hocks (see Figure 5) and along the lower back, where a big cow rubs up against cubicle divisions.

However, you can't always blame the housing the cows currently occupy; old habits may die hard.

Figure 6 shows a new cubicle house that is of broadly adequate dimensions, even though the cubicles

facing the wall are a little too short. The sand bedding is generally adequate.

So what do some cows do? They continue the bad habits picked up in the old housing, where the cubicle number, size and state of repair led to some cows lying out.

Figure 7 shows a large cow dog sitting in a cubicle. This cow is not comfortable, and it's likely the wound on her pin bone has been caused by contact with a cubicle division. Typically, cows will dog sit when they do not have sufficient lungeing space. In this case, it may be because the neck rail is too low for the cow to lie down properly.

Figure 8 depicts the opposite problem. It shows a heifer sitting backwards. This leads to muck getting into the front of the cubicle. This cubicle is too wide. It is clear that one of the divisions has been pushed apart and would benefit from some repairs.

## Common problem

Cows perching in the cubicle is the most frequently seen problem. That is to say, their front legs are up on the cubicle bed and their back legs are in the passage (Figure 9). The typical cause of this is a neck rail that is too low. This is fairly obvious in the picture, as the nearest standing cow has to stretch its neck down to fit under the neck rail.

It's clear that pressure is also being placed on the back feet, a well-recognised risk factor for lameness. These feet do, however, benefit from the straw that has been pushed out from the bed. This helps reduce the amount of muck the back feet are exposed to compared to systems where there is more slurry in the passageway.

Sand beds are seen as among the best type of bedding for cubicles. This is because the inorganic nature of sand leaves bugs bereft of nutrition and the fluids in urine and dung can filter through the sand away from the cow. However, it is not uncommon to find rocks in the sand (Figure 10). In other circumstances, where a deep sand bed does not have enough sand, the underlying surface is exposed and contains loose rocks; this is a very poor surface for the cows.

It's important to be able to make changes to the cubicle format and management because syndromes that can, in part, be blamed on these factors are often encountered. It's useful to develop a framework to investigate the cubicles and engage the client in making changes.

The research work carried out by the Kingshay Farming Trust (www.kingshay.com) has been particularly informative and useful in practice. Figure 11 shows some of Kingshay's work looking at the suitability of commercial cubicles, as well as examining new ideas.

The methodology I use to look at cubicles involves a fourstage process. The first stage is to get the farmer's agreement that it would be useful to examine the cubicles because they are related to

some existing problem on the farm, and also because I may be able to make simple changes to improve the situation.

The next phase uses a structured process to observe the cows and how they use the cubicles. This needs to be done at least an hour after new feed has been put out or any other disturbance to their day. I count the cows at rest, those occupying cubicles abnormally (such as perching) and the nature of the abnormalities seen. In addition to looking at how the cows use the cubicles, I also look for lesions on the cows. Together, this evidence amounts to a verdict on the suitability of the cubicles. This information is recorded on a questionnaire, along with that from the next phase.

The critical dimensions of the cubicles are measured in the third stage. This is simple, but the extent to which there is a difference in dimensions between cubicles in the same house is surprising. This is usually because the cubicles need to be repaired, but it can be because they have been fitted differently.

I calculate the cubicles' ideal dimensions using standard formulae applied to the typical height and width of the cows in the herd. From this, it's clear where the dimensional problems are, such as neck rails being too low or the bed too short.

At this point, I have an idea of how big the cubicles are compared to how big they should be. This is compared to the data on how the cows actually use the cubicles. This allows me to draw up a shortlist of changes that could or should be made.

## Making the changes

The final phase is to discuss this with the client. It is really important to talk it through, because it is likely they already have a good idea about what it is. The important part is to use the discussion as an opportunity to focus on these problems and what might be done about them.

Then the farmer makes all the changes and everything is just fine…

Well, it's not quite like that. The following case study demonstrates the long-term nature and step-by-step approach that may be needed.

Last year, I was approached by a farmer who reported that cows kept getting caught in the cubicles. This had resulted in injuries to cows and one being euthanised. In Figure 12 we see the cubicles in question.

The cubicles were examined in summer, so we could not see how the cows were using them. However, by measuring cows in the herd and then measuring the cubicles, it was clear the neck rails are too low. In addition, the cubicles are too short – this is a particular problem for the cubicles facing the wall, where there is limited lungeing space is available. The other major problem was the

lack of a brisket board. This was the major reason for cows sitting too far forwards and then becoming trapped.

I considered all the problems and devised a plan to convert to shallow sand beds, to raise the neck rail and to insert a brisket board. The first stage has been completed and a brisket board has been installed for this winter (Figures 13 and 14).

As a result of this simple change, the cows no longer get stuck. This has been a real success. An additional benefit is that the cows are much cleaner. This is because they are not lying too far forwards and, so are no longer dunging on the back of the cubicles.

The process is incremental – we have not implemented all the changes in one go. Time and resources are limited and I think that proof of principle was needed to show success. Having done this, we will change to sand bedding later this year to address the rising price of straw and improve the environmental mastitis challenge facing the herd.

Figure 15 shows a new cubicle house with water beds for the cows. I've tried lying on them and they are very good for a human, but what about from the cow's perspective? Well, according to the farmer, "all the cows do is lie down all day".

So it's clear that many problems may be associated with cubicle housing. It is also a fact that well-managed cubicles provide very good accommodation for cows. This debunks the notion that long-term housing for cows is necessarily a poor option. Figure 16 shows a comfortable cubicle house. It is easier to make a new cubicle house comfortable, but we can make many simple changes that lead to direct and tangible improvements in cow welfare and productivity.

## Further reading


- *Housing the 21st Century Dairy Cow – a Review for MDC*. www.dairyco.org.uk/library/researchdevelopment/health-welfare/housing-the-21st-century-cow
- DairyCo: *Cubicles – Housing Dairy Cattle*. www.dairyco.net/farming-infocentre/health-welfare/mastitis/working-arena-prevention-of-infection/housing-keeping-cattle-happy/cubicles-housing-dairy-cattle
- Kingshay. www.kingshay.com