

# Improving shed ventilation for the dairy herd

## Practical Guide



Housing conditions can have a significant impact on dairy cow productivity, health and welfare. It can affect yields and farm profitability, which will also have a negative effect on the farm carbon footprint.

Inadequate ventilation is a significant risk factor for the dairy herd, contributing to a range of conditions such as pneumonia, mastitis and digital dermatitis.

It's worth taking a look at housing and considering if any improvements could be made to increase air flow and ventilation, benefitting herd health and productivity.



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**This practical guide looks at helping to maximise performance of housed cattle by improving ventilation in buildings.**

## Housing conditions and health

Milking cows produce a lot of heat that has to be dissipated. This is done by evaporating moisture from their lungs when breathing out and as sweat through their skin (above 20 degrees). These actions increase the humidity of the surrounding air. However as air humidity increases, the effectiveness of cooling is reduced. Therefore this air must be removed and replaced with clean fresh air. Removing this stale air also reduces the risk of disease spread through the shed - in a poorly ventilated environment, pathogens can survive for relatively long periods because of the more humid conditions. This damp air also causes the humidity of cubicle beds and floors to increase. This can lead to increased cases of digital dermatitis and mastitis. Small alterations to sheds can help to make a massive difference to airflow and subsequent animal health and welfare.

## Websites

[www.farmingforabetterclimate.org](http://www.farmingforabetterclimate.org)  
[www.fas.scot/](http://www.fas.scot/)  
[www.agrecalc.com](http://www.agrecalc.com)



# Dairy shed ventilation

## Cow performance

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Cows perform optimally at 5°C and begin to experience heat stress at 20°C, presuming low humidity. Heat stress can become a real issue for herds housed year round. The problem is made worse in that hot days tend to have little or no wind to help drive air through the shed. The use of fans can help to move air through the shed and are especially important in the collecting yard. On hot days cows should not be kept tight e.g. with backing gates, but instead allow them to have space to reduce heat transfer between cows. In extreme circumstances a sprinkler system could be used, however this is not without additional problems as it could further increase the humidity of the shed. Clipping cattle bare can help them to expel more heat.

## Achieving good ventilation

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Air inlets from the side of the shed are vital for ventilation. The side of a shed should be as open as possible to maximise airflow, however options should be in place for wet and extreme weather e.g. roll up curtains. Excessive wind can cause draughts which cows find unpleasant. This is particularly important in cold weather, as cows will begin to use energy to maintain body temperature below -5°C. Other buildings nearby can obstruct airflow into the shed so carefully consider the site of any new builds in relation to existing sheds.

Air outlet is also particularly important. An open ridge along the shed helps to remove stale air. This air rises due to the heat of the animals, creating the 'stack effect'. The wind passing over the ridge creates a vacuum helping to draw the warm air out the top and draws in fresh air from lower down. The shed should not smell of dung, the air should be fresh.



The stocking rate of a shed can have a big impact in the success of the ventilation. If the shed is overcrowded then airflow may not be sufficient to move the stale air created by these cows. However in large sheds, lower stocking rates can be an issue. With a reduced number of cows the stack effect can fail in getting the stale air out of the top of the shed. In this case fans may be required to force the air out.

## Other considerations

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Cobwebs provide a good indicator of poor ventilation in a shed, however the use of plumbers smoke bombs are an excellent way to establish where the dead pockets of air are in the shed. The smoke from these should completely clear within 2 to 3 minutes from the shed. Aim to carry this out on a day with little wind and high humidity. Good airflow will carry pathogens out of the shed minimising the risks of disease spread.

Check water troughs are working properly without leaks, and that there are no leaks from overflowing gutters. This will minimise additional sources of moisture in the shed and can also help to keep bedding dry.

If making changes to a shed, do a small section first to assess the effectiveness. For example if trying to increase air into the shed, consider removing every second board on the Yorkshire boarding on one bay of the shed. If this is successful then it can be repeated along the full shed. A farm buildings specialist can suggest improvements to current buildings or help in the design of new sheds to ensure there is sufficient ventilation for the stock being housed.