



Dr. Knopf & Oswald

Say goodbye to heat stress



**Improves
the health of
dairy cattle**



CATCOOL

tube ventilation system

Minimise loss – minimise heat stress

Cows feel their best at temperatures between 4 and 16 degrees Celsius. As cows have a high metabolism – converting over 30% of the energy they absorb into heat – when the temperature rises during summer, they find it increasingly difficult to regulate their body heat and dissipate it to their surroundings.

When cows are packed close together, such as in waiting areas, their body temperature increases even more, which has various negative consequences:

- The animals' breathing rate speeds up, which, during prolonged hot spells, upsets their acid-base balance.
- Lower feed intake.
- An elevated body temperature disrupts their oestrous cycle, decreasing fertility and increasing embryonic mortality rates.
- Less time spent lying down.
- Milk yield drops.

Most farm managers have traditionally made use of one of two means for making their animals more comfortable: Natural ventilation through openings in the barn or fan-powered cooling systems.

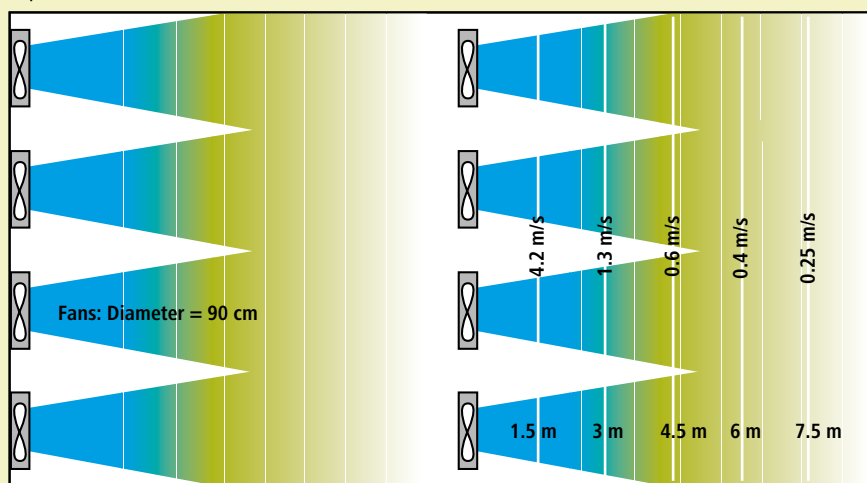
Both of these ventilation methods, however, have serious disadvantages:

- Natural ventilation is largely dependent on the weather and the structural features of the barn, so it won't work on days when there is no wind – an average of 10% of days in the year. Other factors include the barn facing in an unfavourable direction and new buildings or installations preventing air from moving sufficiently.
- Using multiple fans to provide cooling not only consumes a great deal of power but also only moves air over short distances (see image below).
- Fans grouped together in banks direct air downwards in a diagonal stream, which recirculates humid, germ-ridden air around the inside of the barn instead of pushing cool, clean, fresh air into the middle of the barn.
- The air stream generated by the fans only reaches one side and the back of the animals. If the animals are standing close to one another, only a few of them will feel the effects of the air stream and be cooled sufficiently. The majority of animals stand in the wind shadow of others.
- The animals at the top of the hierarchy seek out the best positions, meaning that the rest of the herd are not cooled sufficiently.

Cooling with individual fans or a bank of fans

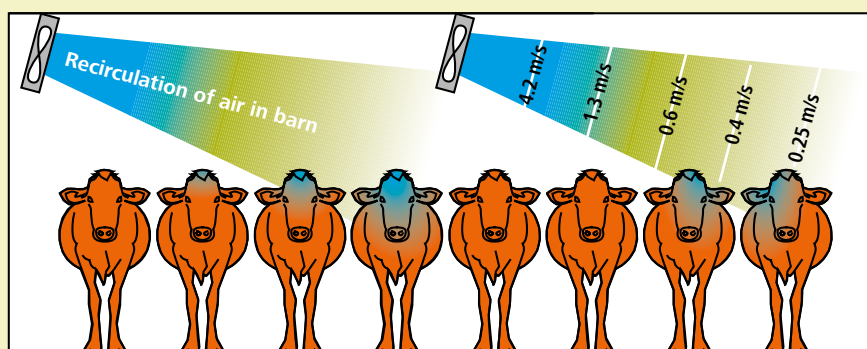
- Air not transported very far
- High number of fans required
- High power consumption
- Wind shadows
- Air full of germs and harmful gases is recirculated through the barn

Top view and side view



At just 4.5 metres away from the fan, the air speed drops to 0.6 metres per second. In order for the animals to feel a cooling effect, however, the air speed must be around 2 metres per second.

This means that very little of the cooling air actually reaches the animals. The cooling power of fans is most effective at about two to three metres away. As fans generate flows of air which are quite close to being horizontal, many of the animals end up standing in the wind shadows of others.



Fresh air with a cooling effect

Our **CATCOOL** tube ventilation system, developed for use in Europe, solves multiple problems with a single solution:

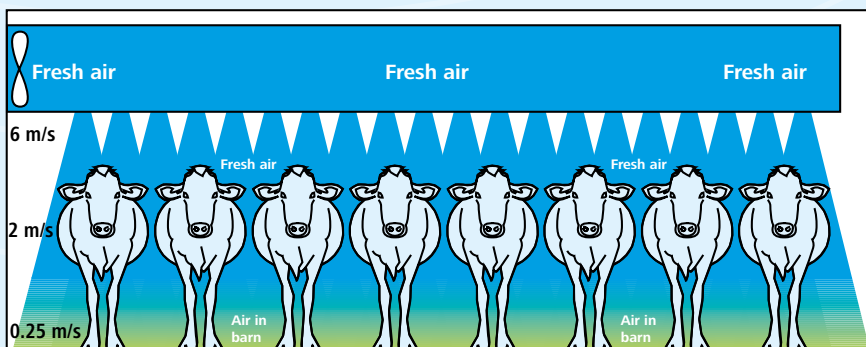
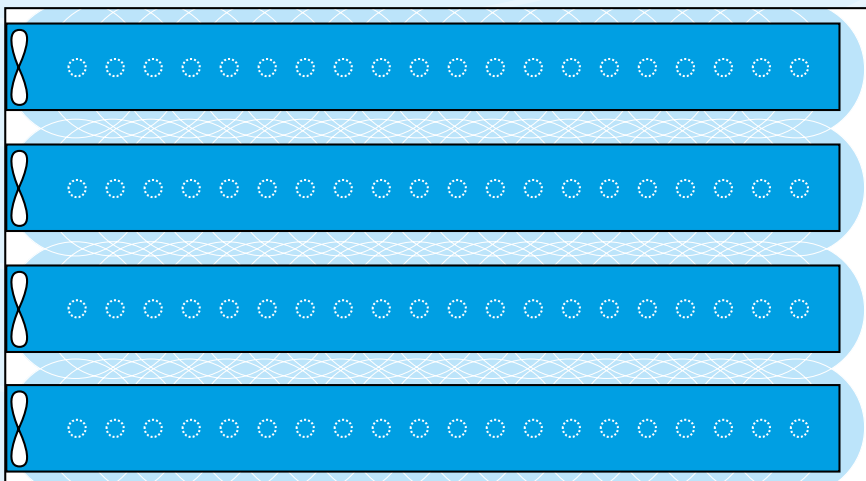
- Only ventilation tubes designed like our **CATCOOL** are capable of conveying cool, clean, fresh air into the middle of the barn and distributing it evenly.
- **CATCOOL** tube ventilation systems provide cooling directly from above and in-between the animals. This gets rid of wind shadows and ensures that animals lower down in the hierarchy are cooled too.
- In comparison with using fans alone, **CATCOOL** tube ventilation systems require fewer fans and less electricity, as the air stream is generated exactly where it is needed and nowhere else.
- **CATCOOL** tube ventilation systems drive out air that is full of germs and harmful gases. The fact that the animals breathe more fresh air helps to prevent respiratory diseases and consequently reduces treatment costs.



"I think this is more efficient, so for the fans you're running, you're getting more cool air. It improves air quality."

Professor Nordlund, School of Veterinary Medicine, University of Wisconsin-Madison, USA
 Source: Progressive Dairyman, "Tube ventilation system provides more efficient cow cooling"

Top view and side view



Cooling with the **CATCOOL** tube ventilation system

- Targeted and effective
- Fewer fans required
- Lower power consumption
- No wind shadows
- Supply of fresh air is cooler and free of germs and harmful gases – across the full length of the tube

The **CATCOOL** ventilation tube generates a constant air flow from top to bottom across its entire length. All the animals in the enclosure are cooled equally and at nose height – even when close together – at a speed of around 2 metres/second. The stream of cooling air reaches every single animal as wind shadows are prevented.



"Thanks to the ventilation system and the cooling effect this has, our milk yield remained steady throughout 2015 – despite the summer being extremely hot. Before we installed the system, our milk yield always dropped in the summer months."

Franz Baumann

New:

Flexible nozzles

CAT COOL is a Knopf & Oswald GmbH brand
You can find offers, information, research and case studies at:

www.frischluft-im-stall.de



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