Troubleshooting Ventilation Problems

Pinpoint challenges and find solutions

This is the final article in our *Ventilation Series*. Below, we will guide you through some common problems to watch out for in your wean-to-finish barns.

"Let's start with the calculations discussed in the last Pig Improver," say our experts. "If everything is set correctly and the desired air speed is not being achieved, we know there are other issues that need to be addressed."

Ventilation problems generally fall into three categories, according to the wean-to-finish technical services team. They are air extraction issues, air distribution problems and incoming air (feeding) issues.

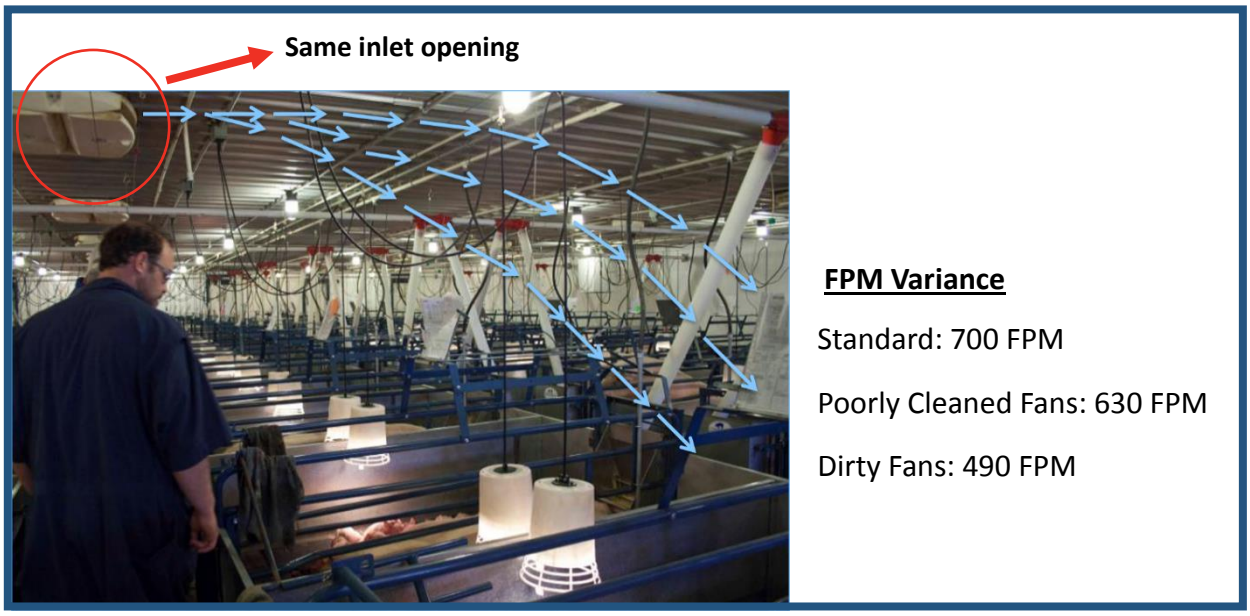
1. Problems with barn air extraction relate to fan power. Fans could be:
   - set incorrectly
   - dirty
   - affected by front wind
   - in need of maintenance
   - inefficient due to loose or slipping belts
   - too low in capacity or have incorrect voltage
   - creating static pressure that's too high
   - blocked by obstacles that reduce output

2. Fresh air distribution problems could be due to:
   - incorrect inlet settings (per curtain controller or counter balances)
   - dirty inlets
   - maintenance issues
   - too few inlets
   - uncontrolled infiltration
   - inlets that are frozen shut

3. Incoming air issues (feeding) could be due to:
   - not enough soffit square footage
   - dirty soffits (plugged bird wire)

Fan power

Let's assume that your fans have the correct capacity and are running at the correct setting. "Some fan power problems are easily solved (dirt) or temporary (front wind)," our experts note. "Indeed, dirty fans can reduce fan speeds from 700 FPM to below 500 FPM. That's a 30% decrease in fan efficiency." See below:



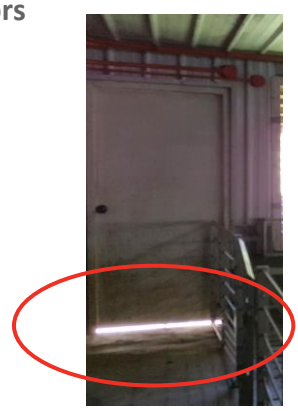
If your fans are dirty, clean them and check the speed. If the speed isn't what it should be, complete a maintenance check right away.

Air distribution

"Air distribution problems could again be due to dirt," our experts explain. "However, let's assume now that your inlets are clean, you already have them set correctly and there are enough inlets. Do a maintenance check to assure there are no mechanical issues. Then, you should next identify any causes of uncontrolled infiltration."

Common Infiltration Problem Sources

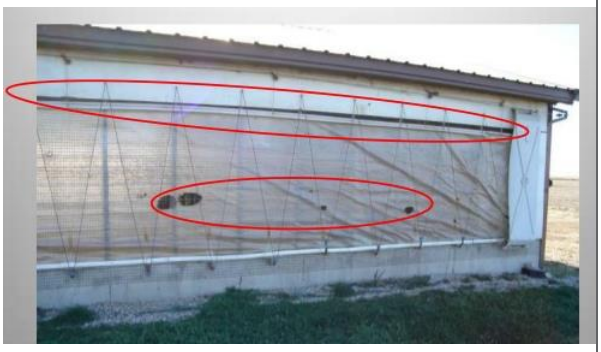
Doors



Louvers

Fans

Curtains



Cracks

Inlets

Keep in mind that one door left open can equal more square footage of incoming air than 30% to 100% of all inlets combined.

“Fans do not ‘know’ where you want them to pull air from - they will pull air from sources with the least resistance!” our experts explain.

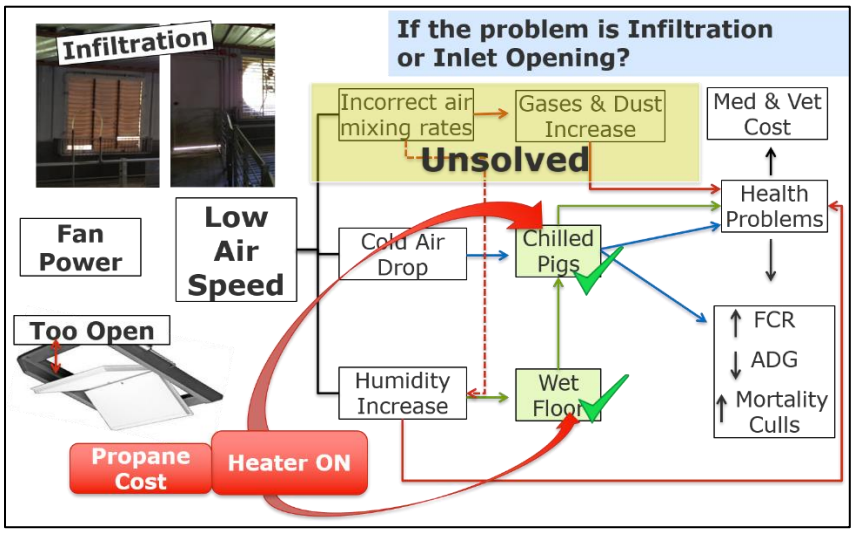
Incoming air issues (feeding)

"Clean your soffits," say our experts, "and make sure there is enough square footage. We often do a great job cleaning the inside of the room, but how often do we walk around the perimeter checking our soffits, pit pump outs and fan cones?"

Troubleshooting practice: Case studies

Hone in your troubleshooting skills with practice. See if you can solve these real-life case studies.

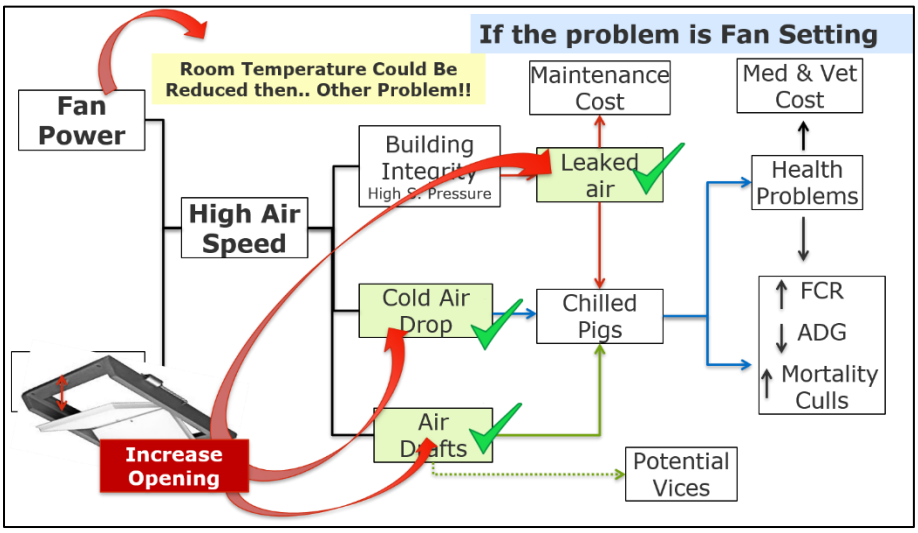
Case study 1: Chilled pigs and wet floors



"The impulse in a situation like this is to turn up the heat,"our experts explain. "However, when we looked at the problem, we discovered the air inlet speed was too low. It must be 600 to 800 FPM."

"On investigation, we also noticed the root cause was infiltration in the louvers and doorways. Once these were fixed, the air speed of the fresh air increased, and cold air and the existing warm barn air met and mixed adequately above the pigs rather than falling right away after entry through the inlet," says our expert. "By the time it sank and reached the pigs, it was a temperature that didn't chill the pigs. This helped more evenly distribute the air allowing for floors to dry up and eliminate unventilated pockets."

Case study 2: Drafts and chilled pigs



In another barn, the speed of air incoming from the inlets was so high that it also produced air drafts and chilled pigs.

“Initially the thought would be to open the inlets more to decrease air speed,” says our expert. “However, we found that the fan setting was significantly higher than the pig needs. Therefore the original thought would have made it difficult to maintain room temperare without burning excess propane.”

It is important when troubleshooting a ventilation issues, every step is followed to ensure the root cause(s) are identified and solutions put in place. Please refer to our Summer and Winter Ventilation Checklist to assist in monitoring and troubleshooting your ventilation system (Appendix B and C in the wean-to-finish manual).

Practical ventilation tips

- In the fall, ensure all fans are clean following fall pumping season and ensure pump out covers are in place and sealed. Dirty louvers and fan blades may decrease fan efficiency by as much as 30%.
- Consider covering wall fans not being used during the fall and winter with plastic wrap to provide insulation and avoid stray cold air entering the barn.
- Clean temperature and brooder probes and ensure accuracy of reading. Place probes in spots that give an accurate temperature reading. Do not place them directly in front of inlets or heaters.

- When colder temps hit, consider using bubble wrap in curtains to provide insulation to the room. Be sure to leave a gap of 10-12 (25-30 cm) inches at the top of the curtain to provide room for air to enter the building in case of an emergency.
- Review minimum ventilation variable fan speeds and inlet openings to achieve a minimum of 600-800 FPM and less than 65% relative humidity.
- Variable speed fans should not run below 50% on the controller. Otherwise, these fans could be in jeopardy of needing frequent maintenance or freezing up.
- During the winter months, adjust temperature bandwidth on the controllers, stage-to-stage, to approximately 1.5–2.0°F (.8-1.1°C).
- Avoid heater overshoot. PIC recommends 2°F heater off-set below the set point. (For example, if the set point is 75°F (24°C), the heaters turn on at 72°F (22.2°C) and off at 73°F (22.8°C))

Tools and resources

PIC has developed the table below to help you through ventilation troubleshooting.

Challenge	Problems	Check Points
Wet Slat	• Increased risk of health challenges	• Consider increasing air speed from inlet • Increase frequency of heater run time
High Humidity (>65%)	• Increased risk of respiratory challenge • Risk of damage to barn structure	• Adjust inlet air speed (increase if apply) • Lower set point
Cold Rooms	• Chilled pigs • Decreased feed/water intake • Decreased feed efficiency • Increased risk of health challenges	• Increase heater run time • Adjust inlet air speed (decrease if apply) • Reduce fan power • Increase desired room temperature • Add insulation between curtains • Cover fans not in use with plastic • Clean temperature and brooder probes
Low inlet air speed	• Air drafts • Increased humidity and gases • Low ventilation rates • Risk of respiratory challenge	• Decrease inlet openings (less open sq. ft. if apply) • Check if fan power needs to be increased • Inspect for air leaks in curtain (holes) and poor door seals • Check soffit area is enough to feed the ventilation system
High inlet air speed	• High speed air drafts • Increased static pressure • Risk of damage to barn structure • Chilled pigs • Reduced fan power	• Check if inlet opening can be increased • Reduce fan power • Check controller settings
Freezing inlets	• Inlets don't open to correct setting • Inlet opening too tight • Starve fans of air flow	• Increase inlet opening make sure total sq. ft. opening match with fan power
Piling pigs	• Increase risk of health challenges • Decreased pig activity	• Increase comfort zone area by adding mat space • Increase brooder temperature • Check location of comfort zone • Adjust room temperature • Check for wet slats
Wide temperature swings	• Increased risk of health challenges	• Increase temperature bandwidth between stages • Match inlet openings to fan power • Check heater off-set

Lastly, use and check controllers, air speed meters (anemometers) and humidity probes daily.

We hope the Pig Improver V*entilation Series* have provided you information and tools to optimize ventilation performance.

Need more guidance? Reach out to your PIC account manager.