













Ventilation = Air Exchange = Bad Air Out & Good Air In

Air Circulation = Moving Air within Barn ≠ Ventilation

Draft = ?

Natural ventilation uses the forces of nature to cause air exchange

Wind is the primary force

đ



































Data collected

Respiratory scores -15 or more nursing calves

- Airborne bacterial counts (Total cfu & coliform) in pens and alleys
- Ammonia in pens
- Temperature & humidity inside and outside
- Bedding depth and dry matter
- Building and inlet dimensions
- Animal counts
- Outdoor wind speed & direction, etc....
 - Compliments of K. Nordlund, 2007



| Calf Respiratory Scoring Criteria | | | | |
|--|-----------|---|-----|--|
| Score: | 0 | 1 | 2 | 3 |
| Rectal Temp. (F) | 100-100.9 | | | >= 103 |
| Cough | None | | | Repeated, |
| Nasal Discharge | Normal | | | Spontaneous Copious, Both Nostrils |
| Ocular Discharge | None | | | Heavy |
| Ear Droop | None | | One | Both or Head Tilt |
| Cumulative Score > = 5 = Respiratory Illness Scoring system developed by Dr. Sheila McGuirk | | | | |

Findings There were lots of sick calves Avg prevalence (RS=5+) = 27% Under-diagnosed in industry

Enzootic calf pneumonia

Compliments of K. Nordlund, 2007























Key factors for respiratory health

- 1) Solid panel between calves P<0.003
- 2) Nesting in deep bedding P<0.002
- 3) Low airborne bacteria counts P<0.003

Lago et.al., J Dairy Sci 89:4014, 2006









Key factors for respiratory health

- 1) Solid panel between calves P<0.003
- 2) Nesting in deep bedding P<0.002
- 3) Low pen airborne bacteria counts P<0.003 Total bacterial counts significant

Coliforms (EMB) not significant

Lago et.al., J Dairy Sci 89:4014, 2006



Factors for ↓ air bacteria in pens 1) Lower temperature P<0.003 2) Larger pens P<0.02 > 30 square feet 3) Fewer solid sides = more ventilation P<0.006

Lago et.al., J Dairy Sci 89:4014, 2006













Technical points

- Fans mounted in wall, not inside barn
- Sized at ~15 cfm / calf
- One tube per ~25 ft of building width
- Custom-punched holes so the air exits at ~ 800 fpm
- Holes punched at 4 & 8 o'clock or 5 & 7 o'clock, depending on height of tube

Compliments of K. Nordlund, 2007

A summary

- Preventing chilling by enclosing the pen is the wrong way to go
- Opening all sides to improve ventilation is the wrong way to go
- Place a solid panel between each calf
- Control chilling with DEEP straw and calf blankets from Nov-March
- Reduce airborne bacteria with bigger pens, fewer sides, and.....
- Supplemental positive pressure ventilation Compliments of K. Nordlund, 2007



















