



Outline

- Why did we do this project?
- What were our objectives?
- How did we evaluate facilities?
- What did we observe?
- Moving forward



Why?




Introduction

- Respiratory disease is a great challenge
 - 12.4% of preweaned calves
 - 93.4% of respiratory challenges are treated with antibiotics
 - 66.7% of dairy operations use antibiotics
 - 31.9% of U.S. dairy operations had no respiratory challenges

USDA, 2007

- Impact of housing
 - Type of housing
 - Type of ventilation system



Introduction

- Providing calves with the best environment (housing & ventilation) and developing management protocols are key aspects to managing heifer rearing costs.
- In order for this to occur, current calf environments in NNY need to be evaluated on how they impact calf health, specifically rates of respiratory illness.

Objectives

- Evaluate rate of respiratory disease on NNY dairies
- Evaluate air quality
 - Temperature, humidity, air flow, airborne microbial concentration and ammonia levels
- Impact of housing, ventilation and air quality on calf health



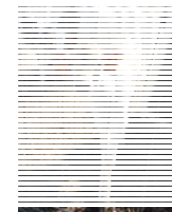
Objectives

- What are we dealing with?
 - Current facilities
 - Current management practices
 - Current health challenges
- What can we do to help?



Materials & Methods

- Farm selection
 - Convenience sample of barns
 - Location
 - Referral
 - No disease outbreaks/major management changes
- One day snapshot in time
 - Environmental & health score



Material & Methods

- Evaluate:
 - Types of housing
 - Hutches, individual pens, group pens
 - Environment & potential stressors
 - Temperature, humidity, NH₃, airborne bacterial counts, bedding bacterial counts, pen size, calves/pen
 - Calf health
 - Calf health scoring
 - Management strategies
 - Survey



Results

LOTS OF DATA

TODAY:

- Environmental evaluation
- Airborne bacteria
- Calf health scores

Also have data on...

- Stocking density
- Bedding bacteria counts
- Management practices



June, 2015

- 29 facilities
 - Hutches (n = 9)
 - Individual pens (n = 11)
 - Group pens (n = 9)
- Ventilation of barns
 - Natural (n = 8)
 - Natural + fan (n = 7)
 - Natural + tube (n = 5)
- 437 calves evaluated



Environmental Assessment

Variable	Mean	Std Dev	Min.	Max.
Temperature (°F)	75.57	7.22	60	87
Humidity (%)	45.68	18.85	10	78
Heat Index	70.64	11.39	43.0	87.7



Environmental Assessment

	Housing				Ventilation			
	Hutch	Individual	Group	SE	Natural	N+Fan	N+Tube	SE
Temp. (°F)	74.43 ^a	70.07 ^b	71.59 ^b	0.65	74.99 ^a	71.47 ^b	70.64 ^b	0.7
Humidity (%)	57.68 ^a	53.16 ^b	58.18 ^a	1.44	46.28 ^c	58.11 ^b	64.64 ^a	1.53
Heat index	68.87	67.89	69.29	1.06	69.67 ^a	70.71 ^a	65.67 ^b	1.14

What about ammonia?



Airborne Bacterial Counts

	Housing				Ventilation			
	Hutch	Individual	Group	SE	Natural	N+Fan	N+Tube	SE
Item ²								
Total Bacteria Count	4.77^a	4.62 ^{ab}	4.37 ^b	0.13	4.77^a	4.55 ^{ab}	4.44 ^b	0.13
Gram Negative Bacterial Count	3.24 ^b	3.75^a	3.31 ^b	0.11	3.56^a	3.56^a	3.14 ^b	0.12

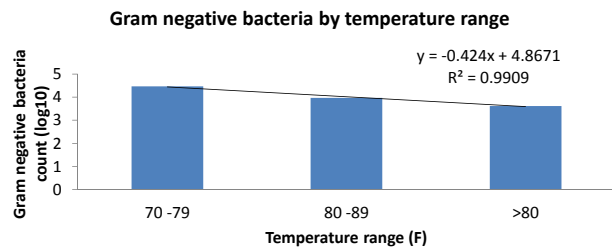
^{a,b} Means within row with different superscript letter differ (P < 0.05).

² All data presented in Log10 format and CFY/m³

- No difference (TBC & GNBC) by bedding type utilized in facility



Airborne Bacterial Counts



- No relationship between TBC and temperature range or airflow.

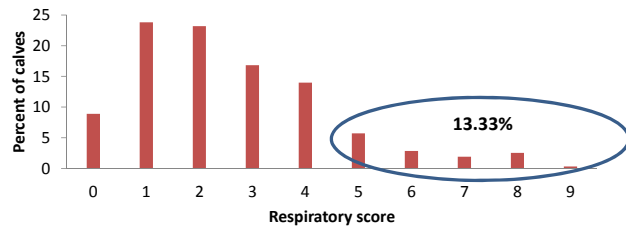


Calf Health

	n	Mean	SD	Min	Max
Calves/pen	437	3.95	6.10	1	25
Eye	437	0.29	0.48	0	2
Ear	437	0.22	0.52	0	3
Cough	437	0.06	0.28	0	2
Temperature	437	102.08	0.80	99.1	105.7
Fecal	437	0.63	0.891	0	4
Nose	437	0.13	0.35	0	2
Score	437	2.46	1.701	0	9



Calf Health



Nationally

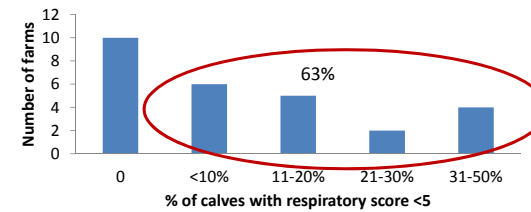
- 12.4% of preweaned heifer calves had a respiratory disease.
- 93.4% of these calves were treated with antibiotics.

USDA, 2007



Calf Health

Number of farms by prevalence of respiratory disease in calves

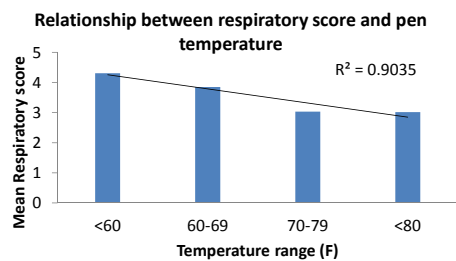


Nationally

- Two-thirds of operations (66.7%) used an antibiotic to treat respiratory disease in preweaned heifers
- One-third (31.9%) had no respiratory disease in preweaned heifers.



Calf Health



- No difference in respiratory score by:
 - Housing type
 - Bedding source
 - Ventilation system
 - Relative humidity
 - Pen airflow
 - Airborne bacterial counts



Conclusion

- 63% of farms in NNY are dealing with respiratory challenges in pre-weaned calves
 - Minimal impact from environmental factors
 - Calf pen temperature
- Need to focus on what is causing these challenges
 - Evaluate management practices



Moving forward

- Evaluate management practice
- Evaluate respiratory disease rates in winter
- Work with producers to evaluate current calf facilities and management practices

What type of facility should I build?

- What do you have experience with?
- What can I manage?
- What changes am I will to make?



Questions???

