Getting Started in Confinement: Cow-Calf Spacing and Ventilation

Morgan Hayes, PE
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Overview

* About Me
* Why Confinement?
* Types of Confinements
* Spacing Needs
* Facility and Ventilation Concerns
* Final Thoughts
Why Confinement?

- Land Availability/Prices
- Seasonal Need---MUD
- Drought
- More Efficient Feed Management
- Better Reproductive Management
- Expansion
- Starting from scratch
Confinement Options

Dry Lot vs Barn

Seasonal vs Year-Round
Types of Confinement Barns
What Animals Are Going to be Confined?

Dry cows
Cows at calving
Cows with calves on the side
Calves after weaning
## Spacing: Dry lots

<table>
<thead>
<tr>
<th>Category</th>
<th>K-State</th>
<th>MWPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry cows</td>
<td>$250ft^2$</td>
<td>$300-500ft^2$</td>
</tr>
<tr>
<td>Cows with calves on the side</td>
<td>$400ft^2$</td>
<td>$500-800ft^2$</td>
</tr>
<tr>
<td>Calves after weaning</td>
<td>$125 ft^2$</td>
<td>$150-300ft^2$</td>
</tr>
</tbody>
</table>
### Spacing: Bedded Barns

<table>
<thead>
<tr>
<th>Category</th>
<th>MWPS</th>
<th>NRCS</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cows with calves on the side</td>
<td>80-120 ft²</td>
<td>80-120 ft²</td>
<td>(Iowa State)</td>
</tr>
<tr>
<td>Dry cows</td>
<td>25-30 ft²</td>
<td>40 ft²</td>
<td>(dairy NRCS)</td>
</tr>
<tr>
<td>Calves after weaning</td>
<td>20-25 ft²</td>
<td>25 ft²</td>
<td>(NRCS)</td>
</tr>
</tbody>
</table>

### Spacing: Slatted Floor

<table>
<thead>
<tr>
<th>Category</th>
<th>MWPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry cows</td>
<td>17-20 ft² per 1000 lbs</td>
</tr>
<tr>
<td>Calves after weaning</td>
<td>10-15 ft²</td>
</tr>
</tbody>
</table>
Feed Bunk Space

Cows need 24-36 linear inches per head

* by 90 days of age, calves can eat 1% BW in forage

Recommended Bunk Height:

- Cows: 22-24 inches
- Calves: 18 inches
- Feeders: 20-22 inches
Feed Bunk Considerations

Age, size, and weight variability of cows will increase likelihood of aggression/competition

Cows usually get more roughage than feeders, deeper feed bunks are often needed to accommodate the bulk

Feed ration can be used to reduce feed cost and/or limit feed

Calves can be weaned much earlier, but they also need access to bunk space and should be adapted to high energy ration (creep)
## Water Volume Requirements

<table>
<thead>
<tr>
<th>Animal Type</th>
<th>Hot Weather</th>
<th>Cool Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow-Calf Pair</td>
<td>18-25 gal/day</td>
<td>11-13 gal/day</td>
</tr>
<tr>
<td>Dry Cows</td>
<td>11-15 gal/day</td>
<td>6-7 gal/day</td>
</tr>
<tr>
<td>Bulls</td>
<td>13-27 gal/day</td>
<td>7-9 gal/day</td>
</tr>
<tr>
<td>Feeder (400lb)</td>
<td>7-11 gal/day</td>
<td>4-5 gal/day</td>
</tr>
<tr>
<td>Feeder (1000lb)</td>
<td>14-22 gal/day</td>
<td>8-11 gal/day</td>
</tr>
</tbody>
</table>
Water Considerations

The higher the dry matter intake, the higher the water requirement

The full day’s water supply should be available in a 4 hour window

A water trough that is a good height for cows is too high for calves
## Waterer Specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Size - Company 1</th>
<th>Size - Company 2</th>
<th>Size - Company 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>51 inch</td>
<td>84 inch</td>
<td>37 inch</td>
</tr>
<tr>
<td>Width</td>
<td>23.5 inch</td>
<td>22 inch</td>
<td>36 inch</td>
</tr>
<tr>
<td>Overall Height</td>
<td>24 inch</td>
<td>27 inch</td>
<td>25 inch</td>
</tr>
<tr>
<td>Drinking Height</td>
<td>16 inch</td>
<td>22 inch</td>
<td></td>
</tr>
<tr>
<td>Heater</td>
<td>548 W</td>
<td>500 W</td>
<td>700 W</td>
</tr>
<tr>
<td>Capacity</td>
<td>20 gal</td>
<td>60 gal</td>
<td>28 gal</td>
</tr>
<tr>
<td>Herd Capacity</td>
<td>200 beef, 100 dairy</td>
<td>200 beef, 100 dairy</td>
<td>200-250 beef, 50-120 cows</td>
</tr>
</tbody>
</table>
Flooring

Dry, dusty conditions can cause respiratory infections.

Wet, muddy conditions cause poor performance.

Calves need dry bedding

Slatted Floors:

cows and feeders: 1.5 - 1.75 inch spacing between slats

calves: 1.25 inch spacing between slats – Not Recommended
## Ventilation Rate Needed

**CFM/Animal**

<table>
<thead>
<tr>
<th></th>
<th>Cold Weather</th>
<th>Mild Weather</th>
<th>Hot Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cows</td>
<td>50</td>
<td>170</td>
<td>470</td>
</tr>
<tr>
<td>Calves</td>
<td>15</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Feeder</td>
<td>30</td>
<td>80</td>
<td>180</td>
</tr>
</tbody>
</table>
Types of Natural Ventilation

**Buoyancy**

**Wind Driven**

http://www.omafra.gov.on.ca
Factors Affecting Ventilation Rate

Ventilation Controlled By:

- Temperature Difference
- Area of Inlet
- Area of Outlet
- Height Between Inlet and Outlet

Buoyancy

http://www.omafra.gov.on.ca
Examples of Ridge Vent/Dual Eaves
Factors Affecting Ventilation Rate

Ventilation Controlled By:

- Wind Direction
- Wind Speed
- Area of Inlet
- Area of Outlet

http://www.omafra.gov.on.ca
Map of January Wind Speed & Direction

http://hurricane.ncdc.noaa.gov/cgi-bin/climaps/climaps.pl?directive=order_details&subrnum=&region=Lower%2048%20States&field-year=1960-91
Map of July Wind Speed & Direction

http://hurricane.ncdc.noaa.gov/cgi-bin/climaps/climaps.pl?directive=order_details&subrnum=&region=Lower%20States&files=08_97
Examples of Wind Driven System
Separation Between Barns

Distance = 0.4 * Height * \sqrt{\text{Length}}
Distance = 3 * Height
Issues with Calves in Confinement

Calving Season Management: dystocia and disease

Diseases: scours, navel infections, and coccidiosis

Cow-Calf Pairs 0-3 Months:

Bully cows/Slow moving calves

Access to feed/water

Protection from weather
Calving Options: Calving Pens

MidWest Plan Service
Calving Options: Sandhill Calving System

Area 1- Week 0&1 Cows with Calves
Area 2- Week 2 Cows with Calves
Area 3- Week 3 Cows with Calves

... move pregnant cows to new area every 7-10 days

When youngest calf is 4 weeks old all can be comingled
Examples of Creep Areas

http://www.texas-trading.com/calf-creep-feeders.html
Creep Areas

- Additional Bedding
- Supplemental Feed
- Protection from Wind
- Protection from Cattle
Final Thoughts

Managing cow-calf operation in confinement:

* Labor increases- poor management causes more negatives
* More precise/individual management is possible
* Is NOT the same as managing feeders in confinement
* The economics have to be evaluated based on your site
Questions?

Dr. Morgan Hayes
hayesmorgan@uky.edu
859-218-4350