

## Considerations for Calf Barn Design

In the heat of summer, those cold days feeding calves in hutches may float to the back of your mind, but summertime is a great time to make renovations to calf housing. Here are a few key features to keep in mind when designing calf facilities.

1. Allow a **minimum of 30 ft cubed (3 m squared)** or more of bedded space per calf. This does **not** include the service alley



2. **Surfaces need to be deeply bedded** especially in weather less than 50 degrees F
  - a. There is an optimal range of temperatures for the calf to utilize the least amount of energy to stay warm and this shifts as the calf gets older.
    - i. Newborn calf: 50-78 degrees F
    - ii. Month old calf: 32-73 degrees F
  - b. Calves with sparse bedding, as opposed to deep bedding have a 30% higher prevalence of respiratory disease.
  - c. Finally, well ventilated barns tend to be chilly in the winter which means deep bedding is extremely important for keeping young calves warm.



**3. Ensure adequate drainage below the bedding**

- a. Solid concrete floor should be created with a slight slope towards the service alley to allow liquids to move away from the pen. Bedding can sometimes remain more wet from soaking up the urine, liquid feces, or water in the pen with a solid floor.
- b. As far as bedding, long straw is less absorbent than wood shavings. Wood shavings work well as a base layer but once soaked through remain wet. Long straw over gravel or concrete sloped to a drain is best for allowing urine to flow away from the pen.
- c. Some facilities are designed with drainage under the bedding. These designs should have a base of 1.5 feet of gravel with 4 inch drainage tile to carry the liquids to outside storage. When cleaning these pens between calves a small amount of gravel should be removed with the straw. The entire gravel and tile base will need to be replaced every 1-3 years depending on the accumulation of straw particles in the gravel.
  - i. This design with gravel for drainage and long straw results in using 60% less straw to achieve adequate depth and improved dryness compared to a full concrete base.

**Drainage under bedding**



**4. Consider “all-in, all-out” design with different sections to allow “down” time for cleaning**

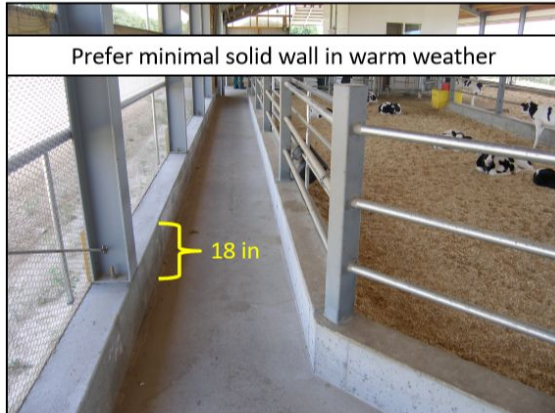
- a. Different sections within your barn allows for weaning groups which move out of the barn all at one time. This is the best case scenario to allow that section to be cleaned and have a minimum of 1 week down time before new baby calves are reintroduced to the space.

**5. Ensure adequate natural ventilation with positive pressure supplemental ventilation if necessary**

- a. Good ventilation is extremely important for prevention of respiratory disease. Natural ventilation alone does not always provide enough air changes per hour and supplemental positive pressure ventilation systems can be extremely beneficial to improve the ventilation of your building.



- 6. Minimal solid sidewalls, limit height to 30 inches.**
- a. Especially in warmer weather, minimal solid side walls are best for optimal air flow. In naturally ventilated barns from the interior floor, side walls should be 2.5 feet or less to avoid becoming a barrier to ventilation.



**7. Individual Pens Key Features**

- a. East-West orientation of the barn (avoids extreme afternoon sun exposure of the pen).
- b. Narrow barns optimize natural ventilation utilizing 1 or 2 rows of pens with barns <36 ft wide.
  - i. Narrow barns also limit exposure of young calves to older calves (fill the barn from one end and always work youngest to oldest).
- c. Pens should be separated from the outer wall by 3 feet of space to avoid drafts.
- d. Solid panels between each calf (or every other calf) but open mesh on the ends of pen and minimal sidewalls to barn.