



Stonecrest Engineering Newsletter

March, 2004

Ventilation for Dry Cows and Heifers

The following is a paper prepared by Rick McBay at Faromor Ltd – a Stonecrest Engineering sister company. The paper details considerations when ventilating a dry cow and/or heifer barn.

INTRODUCTION

Typically the environment created for dry cows and heifers is classified as COLD - that being an environment where winter interior temperatures will drop below freezing. The important considerations here are to keep the area dry and draft free. It is always better to be cold and dry than warm and wet.

BUILDING DESIGNS

Building designs for this type of housing typically will not incorporate a ceiling but will have insulation under the roof steel to prevent condensation and to help prevent a buildup of heat in the summer. This is an important component even in the design of a “cold” building. In addition, the open truss allows for summer convection currents along the roofline for better air movement. If a ceiling is being used, a scissor truss to create a sloped ceiling is desired for the same reason.

VENTILATION SYSTEMS

The natural ventilation system for this type of environment will typically consist of sidewall curtains as well as ridge ventilation.

Sidewall Curtains

Non-insulated curtains that will either be operated manually, or preferably on an automated, temperature-controlled actuator, are the most common approach to sidewall ventilation. The automated system eliminates the large variations in temperature that are commonly seen in the spring and fall. Even in relatively warm outside temperatures, large variations in inside temperature can lead to health problems.

Ridge Ventilation

While the curtains will provide the warm weather ventilation, a ridge exhaust system is required to handle the minimum ventilation requirements in cold weather. The ridge ventilation is designed to remove the moist heat that is being produced by the animals. Without this part of the ventilation system operating properly, the result will be warm interior temperatures in the winter but the level of humidity will be so high that it is not healthy for the animals. This type of environment also accelerates the deterioration of the building materials.

Open ridge ventilation is provided by either a chimney or open slot on the peak of the building. The fact that warm air rises and a difference in interior and exterior temperature creates a draw helps accomplish this action.

In a building with no ceiling, an open ridge can be used, however, the drawbacks of an open ridge include allowing snow and rain penetration and not providing the control that is desirable for winter ventilation.

Chimneys have become popular because they can be operated in a building that uses a ceiling and can be controlled by use of an adjustable damper in each unit. Any ducting added to a chimney is insulated

which adds to the draw effect in cold weather. Chimney dampers are normally operated manually as this is a seasonal adjustment.

DESIGN GUIDELINES FOR COLD BARN

| <u>BLDG WIDTH.</u> | <u>SIDEWALL OPENING</u> | <u>OPEN RIDGE</u> |
|--------------------|-------------------------|-------------------|
| 30 FT. | 24" | 2"-3" |
| 40 FT. | 36" | 3"-4" |
| 50 FT. | 48" | 5"-6" |
| 60 FT. | 48" | 7"-8" |
| 80 FT. | 48"-60" | 9"-10" |
| 100 FT. | 60"-96" | 11"-12" |

CHIMNEYS

- 2 – 4 ft² per 1000 ft² of floor area
- Chimneys must be insulated in attic or exterior areas
- Damper located high in chimney
- Extend chimney above roof 1 – 2 ft. (higher if not on the roof peak)
- Air exit area a minimum of 1.5 times the chimneys cross sectional area
- Chimney cap design and size to minimize down draft

CONCLUSIONS

Although the cost for housing dry cows and heifers is lower than that of the milk herd, we do need to insure that we create the proper environment so that health problems are not created in the heifer barn that will effect you down the road.

FAROMOR LTD.

RICK MCBAY
SALES MANAGER
1-800-960-4002
www.faromor.com