Providing a comfortable, dry resting surface for lactating cows always may serve as the single-most critical success factor for managing a compost bedded pack barn, according to findings from a University of Kentucky College of Agriculture Cooperative Extensive Service study, “Compost Bedded Pack Barn Design Features and Management Considerations,” co-authored by Jeffrey Bewley, UK Animal and Food Sciences, Joe Taraba, Biosystems and Agricultural Engineering, and colleagues.

Additionally, producer-reported benefits of such compost bedded pack barns include more cow comfort, enhanced cow cleanliness, little upkeep, better feet and legs, lower somatic cell count, more heat detection, improved manure management, higher production, boosted longevity, minimal investment expenses, minimal odor, less flies and reduced worry over cow size.

According to the paper, as with any dairy facility, site selection for the barn is critical. To maximize natural ventilation, the barn “should be located to take advantage of prevailing summer winds and the sun. Care should be taken to ensure that the barn is placed far enough away from other barns, silos or buildings,” study authors state. “Barn ventilation must allow for fresh air, since the composting pack generates additional heat and moisture that must escape from the barn” – an issue of significance especially in summer.

Adequate natural ventilation is necessary, according to the study authors, because “ventilation removes heat and moisture created by the cows and the composting process. Proper ventilation generally includes natural air movement through the barn, but mechanical ventilation (fans) can also be used to prevent stagnant areas.”

The authors note that ventilation needs will vary between cold and hot temperatures, meaning there will be ventilation trade-offs (very open in the summer versus open with curtains in the winter). Proper ventilation can improve cows’ overall health and immunity by controlling dust and fine particles that may cause respiratory problems, trouble cooling cows in the summer and issues with drying the pack surface (which helps keep cows clean).

In another paper also led by Bewley, Taraba and other colleagues titled, “Kentucky Compost Bedded Pack Barn Project,” and also from UK College of Ag Co-op Extension Service, producers were asked what they would change about their compost bedded pack. They frequently cited the size or capacity of the pack. Increasing natural ventilation or sidewall height, adding a retaining wall around the perimeter of the barn, adding curtains during the winter and building the barn without posts in the pack were also aspects producers would change.

Bewley says, “This study was a large cross-section study that enabled us to learn from the positive and negative experiences of compost bedded pack barn users. It was enlightening to assimilate all the knowledge of these dairy producers.”

In a take-home message to producers, Bewley says, “Managing a compost bedded pack barn requires some science and art. It is very different than managing a freestall barn. Once the management

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Lessons learned on ventilation in compost bedded pack barns

Stephanie Skernivitz for Progressive Dairyman

Bob Klingensius says that getting the cows to distribute themselves evenly for proper distribution of waste and moisture is one of the biggest challenges of a compost bedded pack barn. Photo courtesy Bob Klingensius.
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techniques are learned, it can be an excellent option for dairy cattle housing.”

Word from the field

Producers were asked to provide lessons learned about the ventilation in compost bedded pack barns and changes made to improve ventilation, as well as recommendations for other producers. Gail Balance, a producer located in the greater Bowling Green, Kentucky area, says, “I love, love, love our compost barn. We run a cultivator through the barn three times per day (and this is important to mix the manure into the sawdust frequently).” We add sawdust anytime an area starts getting wet. The only thing I would do differently is add one more of the Big Ass Fans. The first thing anyone should do before building a compost barn is make sure they have access to about one tractor trailer load of sawdust for every 700 square feet of pack space per year. It will not work without an adequate amount of kiln-dried sawdust,” she says.

Bob Klingensius, producer of Harvest Home Dairy in Crestwood, Kentucky area, says for the barn, 100 square feet per cow is minimum. “Sawdust usage becomes very high with lower square footage per cow. It may be more economical to increase square footage per cow and to reduce sawdust usage than buying sawdust.” He adds, “Getting the cows to distribute themselves evenly in the barn can be another challenge. Even cow distribution equals more even distribution of animal waste and moisture. Also, compost area will need to be protected partially during winter months to protect cows from strong winter winds. A gable opening of sufficient size is a must for proper exchange of air.”

Klingensius adds that consideration of normal wind currents is important. “There will be days the wind comes from an abnormal direction and changes how the barn functions. Cows will use different parts of the barn to take advantage of natural wind currents or avoid in cold weather. “We love the compost barn. Our old barn was hot with poor ventilation. Somatic cell count decreased from 420,000 to 200,000. Lame cows all but disappeared,” he says.

Brandon Fields of Fields Family Farms in Kentucky has a few additional recommendations for producers:

1. Alternate (stagger) each row of fans to prevent dead areas between each fan in the row that follows. Otherwise, you will have strips through the barn that cows won’t use when it’s hot.

2. High-velocity fans work much better, as the additional air speed aids in drying the compost, which is critical to keeping cows clean. It also extends bedding intervals, which saves labor and money.

In conclusion, Bewley says of the Kentucky compost bedded project, the study showed “many of the barns were not ventilated well and short on feed and water space. The producers told us that the idea of waiting until the bedding sticks to the cow before adding new bedding does not work well. Waiting until then is too late. The recommendations provided in our publication should help other producers design barns without these concerns,” he says.

Most surprising to study authors? Bewley says almost every producer was extremely satisfied with their barn. PD

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MOR Visit www.progressivedairy.com/more to see video footage of the compost bedded pack barn at Harvest Home Dairy.