Checklist for a Multipurpose Barn

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This time every year cattle producers are burdened with the task of trudging through mud to feed and care for their cattle. Many producers have come to accept the mud and mess, while others question their sanity (as many farmers do now and then). Which leads to the age old question: *Why do I spend eight months out of the year getting my pastures into shape and then turn around and tear them up during winter feeding? Is there a better way?*

For producers who are serious about rotational grazing and need a tool to protect their pastures, here is a suggestion: Build a multipurpose barn that could be used for not only winter feeding, but also serve many other purposes related to optimum beef production. Figure 1 is a basic concept of a multipurpose barn, which can serve as a winter feeding cow-calf facility that can transition into a maternity, weaning, and possibly finishing barn. During drought, the structure could be used as a place to feed cows to protect pastures from the effects of cattle traffic and grazing pressure. Some producers may even choose to use the structure during unseasonably high rainfall events to hold and feed cattle for a few days to allow pastures to percolate water.

1. Ten considerations for developing a multipurpose building design. **Siting**. This is by far the most important factor. It affects airflow, solar radiation, drainage, and cattle flow patterns. Problems occur when the producer chooses a site based on the location of existing structures. Existing structures that are not sited properly can lead you down the wrong path with the new barn by impeding airflow. Ideal locations for the structure are on ridge tops, clear of any windflow obstructions.

2. **Orientation**. The long side of the barn needs to be along an east-west axis. Feeding should be done along the southern side to take advantage of the winter solstice. A sidewall curtain may be placed along the north side to restrict airflow during winter storms.

3. **Stormwater Management**. Clean water diversion is something that needs to be well thought out. In some cases, orientation to achieve clean water diversion may be more important than the long side of the barn being on an exact east-west bearing. A 20 degree tolerance either way can be used to accommodate an efficient stormwater diversion strategy. Figure 1 shows a four-foot roof overhang to keep precipitation from blowing onto feed and into the barn. Gutters and downspouts should be installed with drainage tile to move clean water away from the facility lessening soil erosion around the facility. Again, a summit position assists with moving water away from the facility.

4. **Cross ventilation**. To facilitate cross ventilation the elevation from the ground to the bottom cord of the rafter, on the southern side, needs to be a minimum of 14 feet. The northern wall should have an opening that is no less than 8 feet. These elevations are needed to facilitate air movement, otherwise respiratory diseases can be problematic.

5. **Roof ventilation**. The roofline and a ridge vent are extremely important to provide maximum ventilation to remove air pollutants. (Figure 2). A 4/12 pitch is ideal. A ridge vent design with a 3-inch opening for every ten feet of width running the full length of the building should provide adequate airflow.

6. **No shadowing**. There should be no obstructions within 200 feet from the facility (minimum), prior to or planned after construction, which would create changes in wind direction or velocity. We call this affect shadowing. Trees that act as windbreaks or other buildings near the facility could cause shadowing.

7. **Side walls**. The east and west walls should be sided to protect animals from solar radiation.

8. **Bedding**. Bedding can be managed as a bedded pack or a compost bedded pack system. Producers need to determine the availability of bedding prior to construction.

9. **Waste Management**. Managing the waste generated from a building must be a consideration. For many producers, managing bedding and manure is different than pasture-based system requirements. Producers need to think through considerations of storing, handling, and applying of manure and bedding in places where utilization will be optimal to avoid discharge of polluted runoff. When used in moderation and with proper planning, the nutrients and organic matter in manure can optimize soil fertility and tilth when applied to crop fields at agronomic rates. However, manure and bedding applications on pasture and hayfields may not be optimal because they do not have high nutrient removal rates. Row crops or high nutrient removing forages like alfalfa allow for the most efficient utilization of nitrogen and phosphorus. A producer may need to have an integrated livestock and crop operation or the ability to export manure to a producer that can utilize the nutrients to effectively use all manure and bedding their building generates.

10. **Adapt**. For this barn to be effective, it needs to be managed as part of a holistic system. Producers may need to adapt and learn the skills necessary to maximize its full potential. This may require modifying management practices that have become tradition. New ideas and skills may make an operation more competitive while at the same time providing additional benefits and opportunities.

Some producers may be hesitant regarding this concept because they cannot get the project to “pencil out” economically. However, if a producer integrates this concept as part of a system that takes away some of the drudgery of farming, it will make the operation better able to fulfil their goals, while simultaneously increasing the conservation effectiveness of their farming operation.

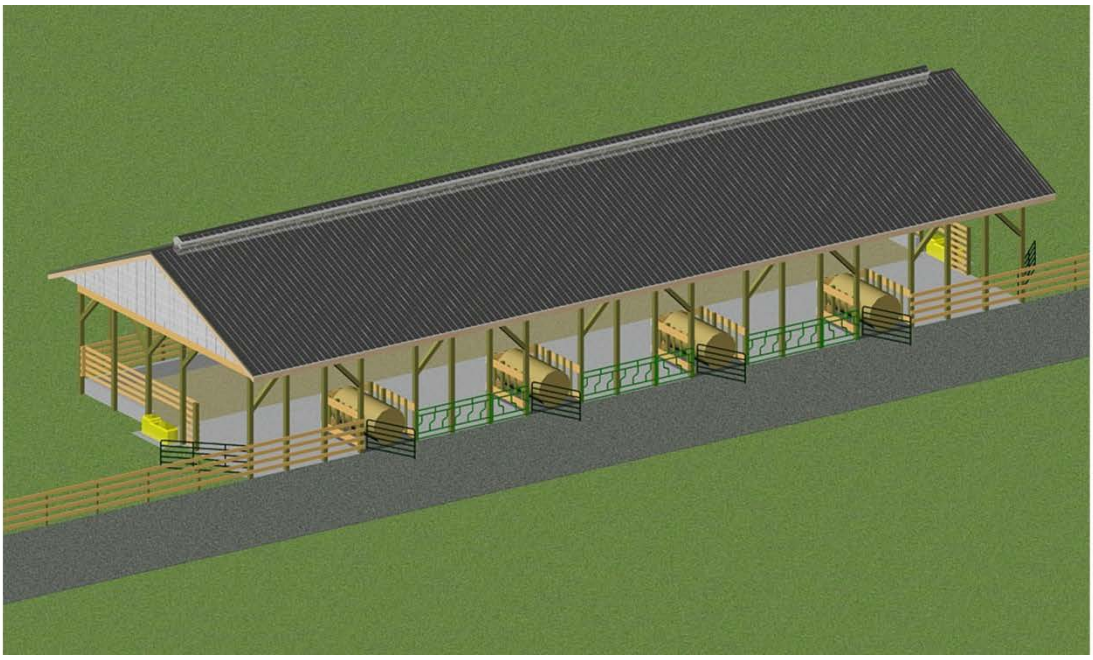

Figure 1. The facility is designed for producers who feed roll bales and provides the flexibility to feed supplemental diets using panels across the front. Credit to James Ash

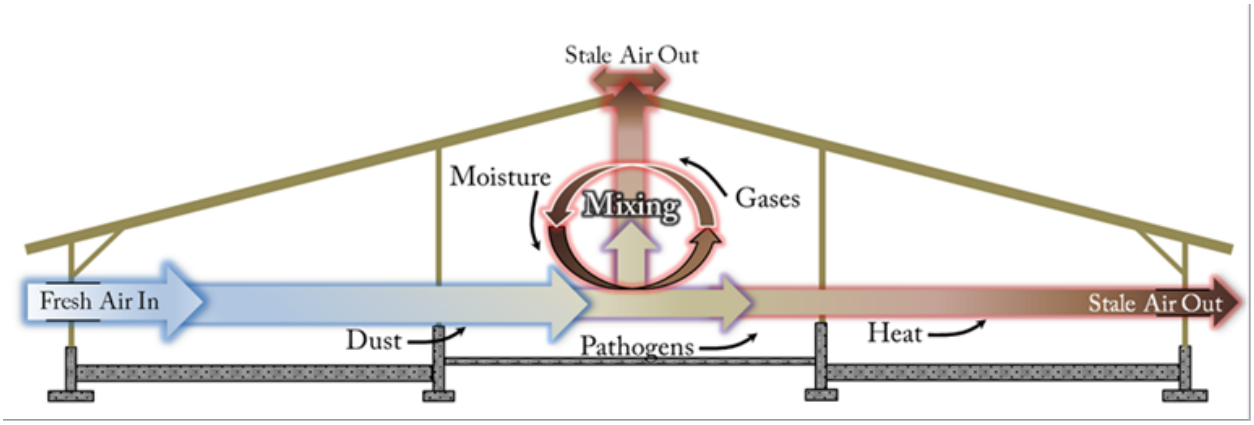

Figure 2 Credit to Donnie Stamper