Comparison of Housing Systems for Finishing Beef Cattle

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Housing systems for finishing beef cattle is a topic of increased interest in the upper Midwest. Several factors have contributed to this including interest in improving animal comfort and performance with recent weather variability and increased scrutiny by regulatory agencies on runoff control in small and medium sized open lot facilities. Deep bedded housing systems have become increasingly popular over the last 10 years. Honeyman and Harmon (2011) estimated that by the end of 2011, there existed 466,000 head of capacity in Iowa of deep bedded finished cattle housing. Considerable construction of new facilities has occurred since that report and interest has increased in slotted floor confinement facilities due to improved nutrient and value retention in the manure and decreased bedding costs. This presentation will review expected differences among facility types in animal comfort and performance, key operational issues including construction and operating costs, environmental management and manure value.

Environmental factors affecting cattle comfort. Both cold stress and heat stress can reduce cattle comfort and decrease performance in the feedlot. Cattle do have the ability to tolerate cold if kept dry and out of the wind. Windbreaks, shelter, bedding and bedding management, and mound management in open lots all serve to improve the animal's ability to tolerate cold stress. During heat stress, shade, sprinklers, adequate water and improved air flow over the animal all can contribute to improved comfort. Of these shade provides the greatest relief during catastrophic heat stress events.

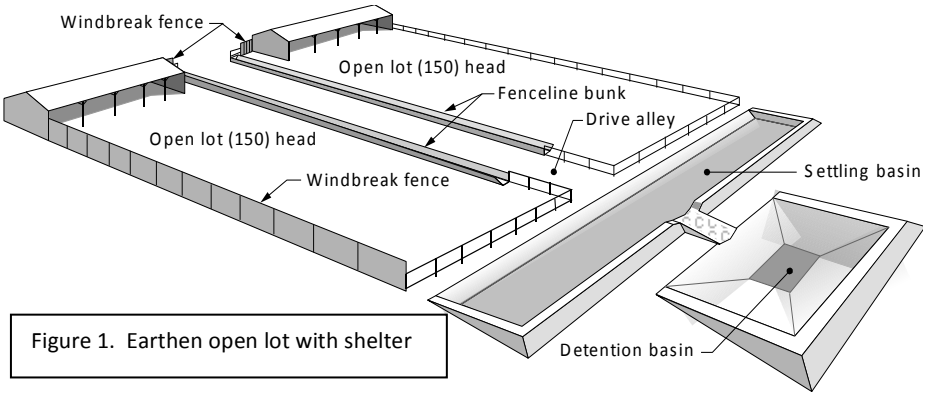

Figure 1. Earthen open lot with shelter

Types of facilities and performance differences. There are four basic types of facilities that are common in the upper Midwest for housing growing and finishing cattle. Of course there are variations on each of these and some "hybrids". These basic facility types (Lawrence et al., 2006) are shown in figures 1-4. The open dirt and concrete lots may be with or without shelter. The buildings in figures 3 and 4 may have a gable roof, mono-slope roof or hoop design. Feed alleys may

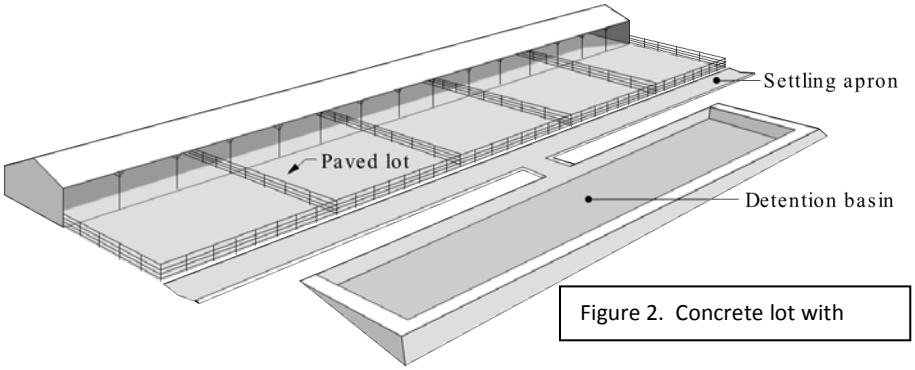

Figure 2. Concrete lot with

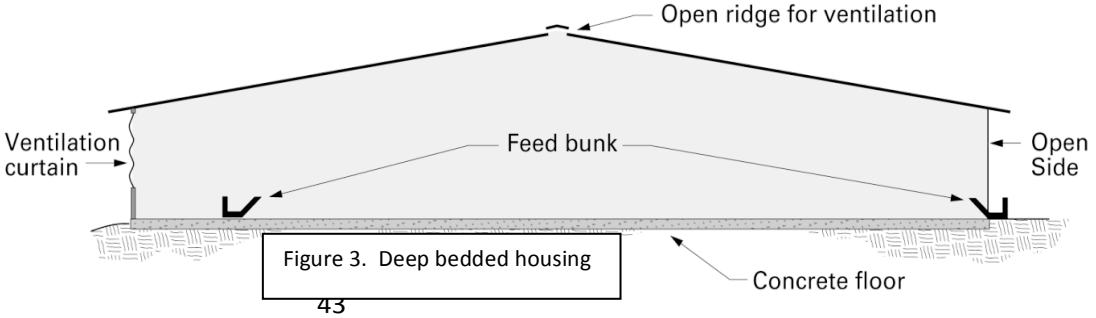

Figure 3. Deep bedded housing

be on one or both sides.

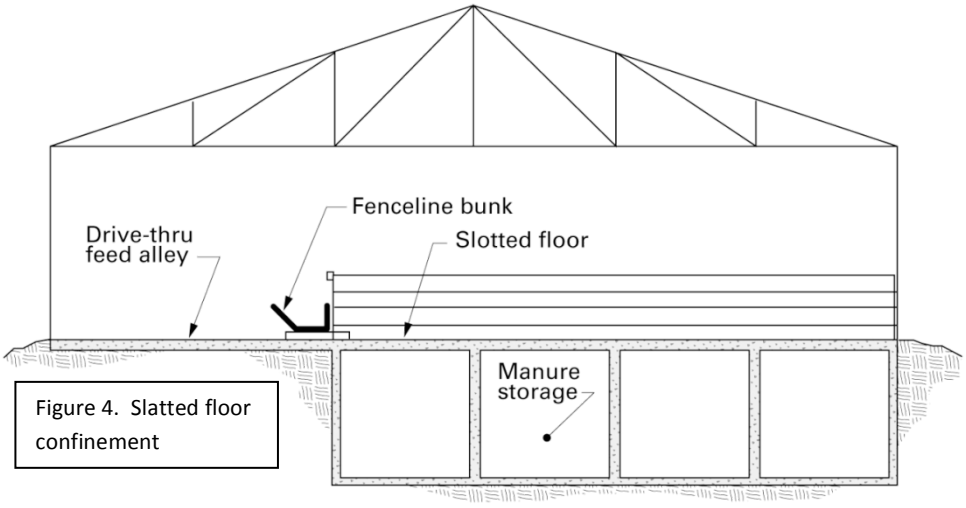

Figure 4. Slatted floor confinement

Previous research conducted in the 1970's, 80's and 90's resulted in an average year round performance response to shelter of a 5% improvement in feed conversion compared to no shelter in studies conducted in the upper Midwest. Those studies also noted a 3% improvement in feed conversion with confinement compared to open lots with some reduction in feed intake (Lawrence et. al., 2006). More recent comparisons have found no difference in performance comparing an open lot with shelter system to a hoop system (Honeyman et. al., 2009) and a 6.3% improvement in feed conversion comparing deep bedded housing and open lots with no shelter (Pastoor, et. al., 2012). A South Dakota comparison of open lots, open lots with shelter and a deep bedded mono-slope building found that the use of shelter improved feed conversion 2.8% (Holland et. al., 2011).

Construction and operational factors in comparing beef housing systems. Lawrence et. al. (2006) conducted an extensive comparison of feedlot systems in the "Beef Systems Feedlot Manual". Several assumptions were made in this analysis that may differ among individual producers. Also, key assumptions such as feed and bedding costs are out of date with current costs. Factoring in these differences a few key summary statements of the comparison can still be made. These are:

1. Confinement systems have the highest initial investment
2. Economies of size exist for runoff containment
3. Operational costs are highest with the deep bedded housing mostly due to bedding costs
4. The cost of shelter is justified in all systems
5. To capture the value of initial investments in confinement producers must also capture and utilize increased manure nutrient values.

References

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