Beef cattle feeding in deep-bedded hoop barns

Mark S. Honeyman
Iowa State University, honeyman@iastate.edu

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Abstract
A low-cost, versatile bedded hoop barn for feeding cattle may help alleviate runoff and other environmental problems associated with open beef cattle feedlots while maintaining animal performance.

Keywords
Animal management and forage, Economic and environmental impacts, Hoops and alternative livestock systems

Disciplines
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Abstract: A low-cost, versatile bedded hoop barn for feeding cattle may help alleviate runoff and other environmental problems associated with open beef cattle feedlots while maintaining animal performance.

Background

Open beef cattle feedlots, particularly in the cattle feeding states such as Iowa that receive higher rainfall, face serious questions about water quality impacts and possible regulatory controls. Outside feedlots have lower facility costs, but higher environmental costs. Confinement systems have higher facility costs, but lower environmental costs. Producers are seeking options with low costs both for facilities and for environmental controls. A bedded hoop barn potentially offers low facility investment, no feedlot runoff, solid manure handling, low odor and dust, easy management, and good animal performance. However, hoop barns have not been used widely for feeding beef cattle, and there has been little research done in this area.

The objective of the study was to quantify the environment in a bedded hoop barn used for finishing beef cattle and to compare beef cattle performance in hoops with those in conventional open feedlots.

Approach and methods

In order to compare bedded hoop barns to outside feeding lots for beef cattle, a hoop barn (50 x 120 ft) was constructed at the ISU Armstrong Research Farm near Lewis. (All project costs went to construction.) The barn houses 120 head of steers in three pens with approximately 50 square feet per animal. Cornstalk bedding is used to facilitate solid manure handling. Manure is composted during the summer and winter months for land application in spring and fall. The hoop system is being compared to an outside feedlot with shed, under common management.

Shortly after completion of construction in fall 2004, a feasibility trial was conducted with steer and heifer calves from the ISU McNay Research Farm. Two pens of steers were allotted to each system. One heifer pen was placed in the hoop building and two heifer pens were allotted to partial confinement. Cattle were marketed in two groups approximately five weeks apart. The diet fed was 78 percent dry corn, 17 percent ground hay and a 1 percent supplement on a dry matter basis. Performance, carcass characteristics, labor, and bedding use data were collected, and comparisons were made between the bedded facility and the conventional semi-confinement system.

Results and discussion

Performance and carcass measurements appeared similar in the two systems. Quality and yield grade data
did not differ between the systems. However, the hoop building cattle used more bedding and appeared to have less mud on them than those cattle in partial confinement. Labor use may have favored the hoop building compared to the conventional system. Average daily weight gain, feed to gain and dry matter intake showed no differences between the systems and within the groups of cattle by sex.

Conclusions

Thus far, the bedded hoop barn is performing well. In this preliminary study, animal performance and carcass characteristics of steer and heifer calves fed in a deep-bedded hoop barn compared favorably with those in partial confinement. (Historically the partial confinement system has been popular in Iowa because experience and research with similar systems has been positive.)

Further study will investigate the seasonal performance of yearling steers in the two systems over a three-year period. Two groups of yearling steers will be fed in each system, one in the summer and one in the winter. A complete economic analysis will be prepared at the end of the study, with evaluations of animal performance and operational costs.

Impact of results

In summer 2005, a three-year experiment was begun to compare the two Armstrong Farm facilities with two turns of yearling cattle tested per year. Data will be collected on performance, cost, bedding use, labor and manure output. The work is innovative and its major impact is still some years away.

Education and outreach

Two ISU Extension Animal Industry Reports were written about the project. A publication available from MidWest Plan Service (Hoop Barns for Beef Cattle AED-50, 2004) contains detailed plans for building a hoop barn. Nearly 550 people have visited the hoop barns in a 16-month period, including those who attended two field days.

Leveraged funds

Additional funding from the Iowa Cattlemen’s Foundation, the Iowa Beef Center, and area cattle feeders was secured to match the Leopold Center grant.