



Planning for a Feedlot Expansion

*Alfredo DiCostanzo and Grant Crawford
University of Minnesota Beef Team*

In spite of increasing corn prices, incentives for feedlot expansion exist in the Upper Midwest due to the increased supply of ethanol co-product feeds, relatively inexpensive corn and forage, availability of crop land for manure application, and clearly defined feedlot regulations in states like Minnesota. A recent estimate of distillers' grains supply of 24 million tons by the year 2010, and currently slow exports will likely result in an oversupply of distillers' grains at prices below par with corn (\$90 to \$100/dry ton). On the other hand, pressure from high corn and fuel prices, and low availability of crop land for manure application in the Texas panhandle will likely pressure feeders to consider expansion or relocation to the Upper Midwest.

Expansion plans should only be considered when supported by clearly defined goals and a business plan. However, further considerations need to be made with regards to evaluation of prior performance and land resources (Figure 1). Performance, defined as feedlot gain, feed conversion, feeding and total costs, morbidity and mortality levels, and carcass value, should reflect the manager's ability to maintain positive feedlot returns at least 6 out of 10 years. Because expansion will result in greater manure volume, the feedlot manager must also consider land resources and crop plans in order to determine whether expansion can be supported by existing or additional (potential arrangements with neighbors) land resources. As interest increases for corn and soybean acres, land availability for manure application ought to increase concurrent with plans for

feedlot expansion.

In the state of Minnesota, environmental regulatory requirements differ for feedlots over or under 1,000 animal units (AU). Therefore, the flow chart in Figure 1 describes steps to expand to under 1,000 or over 1,000 AU. Two key regulatory requirements kick in at 1,000 AU. First, an environmental assessment worksheet (EAW) is required if expanding by 500 or more AU in a sensitive area or by 1,000 or more AU outside of a sensitive area. Sensitive areas are defined as shoreland areas, delineated floodplains, wild and scenic river districts, areas within 1,000 feet of a karst feature such as a sinkhole or cave, and vulnerable parts of a delineated drinking water supply area. Second, a federal National Pollutant Discharge Elimination System (NPDES) permit is required if total animals on the farm exceed 1,000 beef cattle or 1,000 AU if multiple animal types are present. More information on feedlot environmental regulations can be found on the Minnesota Pollution Control Agency (MPCA) website at www.pca.state.mn.us/hot/feedlot-publications.html or by calling the MPCA at 877.333.3508. For requirements in states other than Minnesota, please contact the state's pollution control website.

Once the new capacity is defined, a feedlot manager must consider types of feedlots with which to expand. Typically, however, feeders will likely determine the facility type based on existing design or a modification

thereof. However, this is a critical time to consider alternatives that will aid in maintaining or enhancing performance, or improve manure management. Three types of feedlot designs describe most feedlots today: open with runoff control, confinement with bedding packs (with or without an outside loafing area), or confinement with deep pits.

scraped when cattle are moved to another pen or marketed, and surface water runoff is collected by a series of concrete pads and chute channels into a discharge canal and storage basin. Storage basin water is pumped for crop irrigation. Cattle have access to 6 to 9 in bunk space/head, and automatic, heated water troughs.

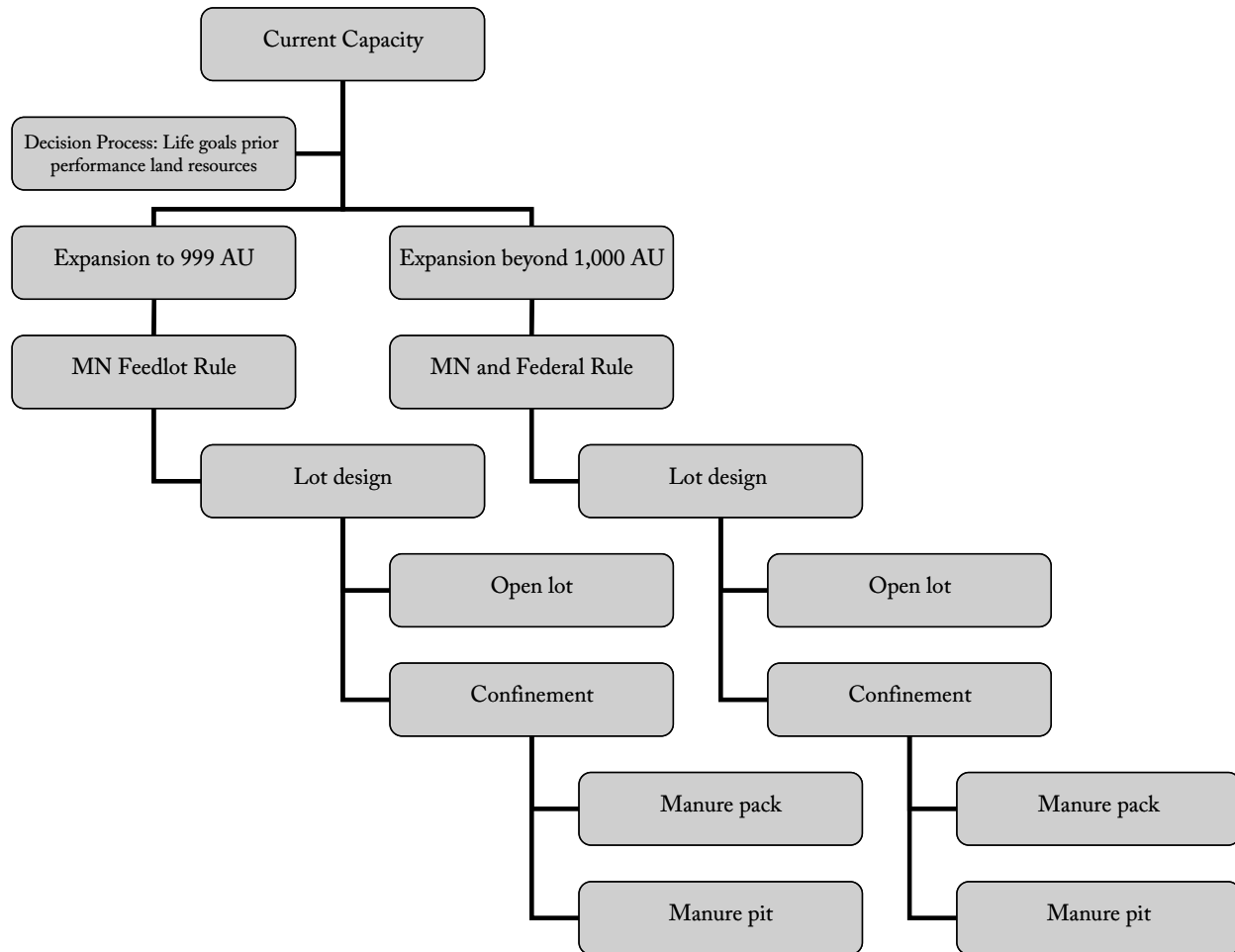


Figure 1. Feedlot expansion flow-chart.

Open lots demand large acreages where cattle are in pens accommodating as many as 500 head (150 to 250 ft²/head) with unpaved surfaces, except for concrete aprons behind feeding bunks and around water troughs. Lots are contoured to manage runoff caused by precipitation via earthen storage basins. Bedding should be used for cattle comfort during the winter months. Manure (slurry) should be removed weekly or more frequently from the concrete aprons behind the feeding bunks. Unpaved surfaces are

Within the total confinement design, several manure management systems may be used: solid manure aided by heavy use of bedding materials (straw, cornstalks, sawdust, etc.) or slurry manure management using an underground deep pit under concrete slatted floors. The total confinement feedlot with manure pack is bedded regularly, and aprons are scraped as needed. Cattle are stocked at the rate of approximately 35 ft², and have access to 6 to 9 in bunk space/head, and automatic,

heated water troughs. Manure packs are removed when cattle are moved to another pen or marketed. In the total confinement feedlot, manure (liquid and solid) is fully contained in an underground concrete pit directly below the feedlot pens. Manure reaches this pit through slatted concrete floors. Pits are agitated and pumped twice a year, and the slurry is applied to fields. Cattle are stocked at the rate of approximately 24 ft², and have access to 6 to 9 in bunk space/head, and automatic, heated water troughs.

The decision to choose between an open lot and a confinement design rests squarely on the economics resulting from advantages and disadvantages of each design. Assuming full environmental compliance in either system, the open lot offers the option of low cost investment (assuming earth movement is minimal), and low maintenance costs. However, performance may be affected particularly during wet seasons in the fall and spring. The opposite is true for full confinement designs; performance is likely more consistent throughout the year, but building and maintenance costs may offset this advantage.

Data derived from open vs confinement lot comparisons in Morris, MN between 1974 and 1977 were used to convert performance advantage in confinement lots to economic gain, and prorated building and maintenance costs were used to determine net economic gain from building confinement feedlots. In various comparisons between open lot and confinement facilities, yearlings and calves in confinement gained 0.32 and 0.23 more lb/day than those in open lots. They also converted feed to gain at 0.54 and 0.37 fewer lb DM/lb gain. At current grain prices and yardage charges, these advantages translate to \$20.09/head and \$22.75/head greater net returns for yearlings and calves, respectively. Thus, for a year occupancy, the advantage of the confinement system is \$42.84/head space. Assuming greater bedding usage (\$6.45/head), labor (\$3.60/head) and building/depreciation costs (\$24.00/head), the confinement system retains a \$8.79/head space advantage over the open lot. In a 2,000-head feedlot, this value would translate to \$17,580.00 greater return. However, it is important to note that if figures change radically from those presented here, net economic gain may be lost.