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Erik Loe

South Dakota State University

Robbi Pritchard

South Dakota State University

Matt Loewe

South Dakota State University

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Opportunities Farm Update

Erik Loe¹, Robbi Pritchard¹, and Matt Loewe²
Department of Animal and Range Sciences

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Summary

Opportunities Farm allows comparisons of different feedlot facilities located on one site for use in teaching and outreach. The three facilities are: 1) bed-pack confinement, 2) dirt-mound open pens, and 3) partially-covered pens. The first cattle were placed in Opportunities Farm in February 2004. There have been 3,023 head of steers and heifers marketed from Opportunities Farm through June 2006.

Introduction

There are multiple feedlot facility designs that presumably aid in managing the weather extremes encountered in the Midwest and Northern Great Plains. Furthermore, management of manure nutrients is an important feature of modern feedlots. There has been renewed interest in cattle feeding in South Dakota which appears to be a continuing trend. Cattle feeding enterprises on farms and ranches may allow multiple generations to be involved with production agriculture. Due to these factors, generating data to evaluate the effect of feedlot facility on cattle performance, economics of cattle feeding, and nutrient management is important for cattle feeders.

Opportunities Farm cattle feeding facilities, constructed during 2003 and 2004, were built as a production-scale classroom and laboratory. This allows student involvement and learning in an environment similar to what they could develop once they have completed college. Additionally, the feedlot facilities allow cattle performance comparisons among three cattle feeding facilities. Facility comparison data that are currently being generated include: 1) cattle performance comparisons; 2) non-feed costs comparisons; and 3) meat quality comparisons.

Feedlot Facility Description

There are three cattle feeding facilities at Opportunities Farm. The three facilities are described as 1) bed-pack confinement (Confinement), 2) dirt-mound open pens (Open), and 3) partially-covered pens (Iowa). Each facility contains four pens and each pen can hold 80 head of cattle (320 head capacity within a facility, 960 total head capacity of the feedlot). Diagrams of the facilities are depicted in Figure 1.

¹ Extension Beef Feedlot Specialist

² Distinguished Professor

³ Manager, Opportunities Farm

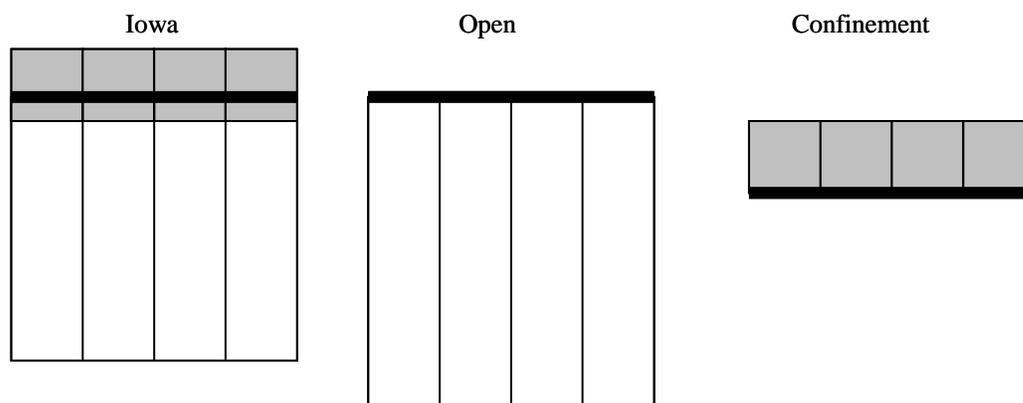


Figure 1. Topographic image of the three feedlot facilities. The bunk line is represented with the thick, black line (■) and the Partial and Confinement monoslope buildings are represented with the shaded areas (■).

The facilities were designed for comparison purposes. Thus, each facility has similar bunk space (80 feet/pen; 12 inches/head), and within a facility, similar pen dimensions. Each pen

contains a concrete waterer that provides a total of 100 inches of water space/pen (1.25 inches/head). Pen dimensions are listed in Table 1.

Table 1. Dimensions of the three feedlot facilities at the Opportunities Farm

Item	Confinement ^a	Open ^a	Iowa ^a
Building dimensions, feet ^b	360 × 40	–	320 × 35
Pen width, feet	90	80	80
Pen depth, feet	40	275	215
Bunk space, inches/head	12	12	12
Animal space, feet ² /head	45	275	215
Water space, inches/head	1.25	1.25	1.25
Area under roof, feet ² /head	45	–	20

^a Confinement = bed-pack confinement; Open = dirt-mound open pens; Iowa = partially-covered pens

^b Dimensions of the entire building that spans the length of four feedlot pens

The bed-pack confinement facility is oriented East to West with the bunk line on the South side of the building. The entire facility is covered by a steel-monoslope building that is 360 feet × 40 feet. The slope of the roof is South to North. The height of the South side of the building allows for afternoon sun to reach the back of the building. Each pen is 90 feet wide and 40 feet deep allowing 45 feet² per head of pen space. The entire floor surface is concrete with a slight slope towards the center of the pen from both bunk and back of the pen. Waterers are located in the back 1/3 of the pen. The pens are bedded weekly with approximately one ton of corn

stover. To clean the pens, cattle are moved through gates located along the bunk line and held in the feed alley while the front 2/3 of the pen is scraped. Bedding is added to the back 1/3 of the pen and is considered the bed-pack.

The dirt-mound open pen bunk line is oriented East to West with the bunk line on the North side of the pens. Each pen is 80 feet wide and 275 feet deep allowing 275 feet² per head of pen space. There is a 12 foot concrete-feed apron. The waterers are located 30 ft from the bunk along the fence line. Mounds are located along the fenceline, sloping towards the back-center of

the pen. The slope towards the back of the pen begins approximately 20 feet from the feed apron. At the back of the pen, the mounds are approximately 8 feet high with a slope of 4:1 (one foot drop for every 4 linear feet). Manure from the pens is scraped, piled, and hauled after each pen of cattle is marketed.

The partially-covered pens are oriented similar to the dirt-mounded open pens. Each pen in this facility is 80 feet wide and 215 feet deep allowing 215 feet² per head of pen space. There is a monoslope building that covers the feed alley, bunk, waterer, and front 20 feet of the pen. The dimensions of the building are 320 feet × 35

feet. Waterers are located 10 feet from the bunk, along the fence line. The entire area underneath the building and 12 feet beyond the South end of the building is concrete. Mounds are located along the fenceline, sloping towards the back-center of the pen. At the back of the pen, the mounds are approximately 3 feet high with a slope of 4:1 (one foot drop for every 4 linear feet). Manure from the dirt portion of the pens is scraped, piled, and hauled after each pen of cattle is marketed. Periodically, while cattle are in the pens the area under the roof is cleaned. During the winter, bedding is occasionally added to the area under the roof.