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FEEDLOT FACILITIES

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SUMMARY

Lot-feeding is the rearing of cattle within confined facilities in which they are fed diets consisting of varying ratios of grain to roughage.

The facilities required for a cattle feedlot are described together with factors which influence both the design and location of the facilities.

Facilities required for profitable feedlot performance must result in the best possible environment for the cattle. The design and construction should allow the animals to use as much of their feed intake as possible for beef production. Good facilities are also essential for good management. A high standard of management is required for profitable beef feedlotting.

DESIGN

Feedlot facilities are designed to contain the cattle within a suitable environment which will enable feeding and management techniques to be administered in the most profitable manner. The facilities required include: Pens and races, or alleys; feed troughs; water troughs; handling facilities; buildings for feed preparation and storage.

The area required for the site varies according to the density of cattle desired per unit area, and the capacity of the feedlot at one time. Approximate area requirements are:

<i>Feedlot Capacity (head of cattle)</i>	<i>hectare</i>
200	1
500	2.5
1 000	5
5 000	15
10 000	35

The location and design of the facilities and their position on the site in relation to each other are largely influenced by a number of locality factors.

LOCALITY FACTORS

Climate: An annual rainfall of 600 mm is regarded as the maximum for an open feedlot. In higher rainfall areas enclosed buildings are required. Where high temperatures prevail for long periods shade is necessary over a portion of the rest area.

The density of cattle in the pen can be varied in relation to the climate. To minimize mud problems the area per animal can be increased to 40 m² while for dust problems the area can be reduced to 7 m².

Topography: Good drainage is essential and the slope of the surface needs to be 4% to create surface runoff. Mole and tile drains are required in every permanent feedlot pen as mud can reduce animal performance more than wind or rain.

Rest areas in the pens must be dry at all times for the beasts to keep clean. In a small feedlot cubicles can be built for each animal. However, in a feedlot of 500 head or more, high mounds of sawdust or post peelings over soil can be constructed at lower cost.

The structure of the ground surface needs to be able to withstand the constant pressure of 3.5 kg/cm² exerted by the hoof of the average cattle beast. A light sandy/limestone surface is ideal.

Feed Resources: The location of a feedlot should be close to the supply of feed ingredients. Cattle can be transported to feed more economically than feed can be transported to the cattle.

Energy Resources: Three-phase electricity is required for most feed storage and processing equipment as well as for lights over the pens. Gas and oil fuel may also be necessary.

Water Resources: Fresh, clean water must be continually available. Cattle weighing between 350 and 550 kg per head liveweight will each consume between 45 and 90 litres per day.

Shelter: Cattle need shelter from prevailing cold winds. In areas with a high rainfall the feed trough can be covered. This practice is not encouraged as cattle tend to remain near the shelter causing fouling of the area, and restrict feeding access to other cattle.

Final Size: The feedlot pens are usually located around the feed processing and storage buildings to keep down the distance travelled to feed the cattle. Many feedlots begin small and are increased in size as the enterprise grows. Consequently, the area for future expansion must be considered from the outset as the cost of expanding a feedlot is much lower than building another feedlot on a new site.

These locality factors all have an influence on the site chosen for the feedlot, and on the construction and design that is most suited to that location. In addition, the final layout of the facilities needs to provide the most efficient access

and traffic flow within the feedlot for the cattle, feed, equipment and the people engaged in the enterprise.

FEEDLOT FACILITIES

Feedlot facilities may be grouped under two major headings:

- (1) Yards—pens, feed troughs, water troughs, handling facilities;
- (2) Buildings—office, mill complex, storage.

YARDS

Pens

A rectangular pen layout is suggested for convenience. The area required per animal varies according to the climate and the soil structure; 12 m² per beast is satisfactory, while 7 m² is regarded as the minimum.

The number of beasts per pen can vary; a low number, however, carries a high capital cost per head. A pen measuring 60 m × 25 m is a convenient size from many aspects and can hold 125 cattle. There is little scientific evidence for the best size of pen required to give maximum cattle performance. For custom feeding a variety of pen sizes are required to meet the variation in cattle numbers.

To provide efficient movement of cattle to and from pens working alleys need to be 3 m wide. Where separate feed alleys are used these should be 6 m in width for easy feeding into the troughs to keep fresh feed available all the time. In a small feedlot working and feeding alleys can be combined.

Construction of the pen fences is straightforward, using wooden or steel posts 1.5 m in height above ground level. A heavy wooden top rail is advisable and also three lighter wooden rails in between to ground level (or cable or pipe may be used for some of these rails). Feed troughs are incorporated into one of the fence lines, and on the pen side a 3 m apron of concrete keeps the feeding area clear of mud. If gates are located between the pens adjacent to the trough, the concrete can be mechanically scraped to keep the area clean. Additional concrete on the feedlot floor is not a recommended practice.

A gate is required at the rear of each pen to provide access to the working alley. Lights will assist in keeping cattle quiet during darkness and performance is consequently enhanced.

Feed Troughs

The troughs form a stock-proof side to the pen. They are accessible to the feed supply vehicle from the outside of the pen and to the cattle from the inside.

The length of trough required per head of cattle depends on the availability of feed. If feed is in the troughs all the time then 15 cm per head is sufficient trough space, otherwise up to 45 cm per head can be required.

Materials used in construction include concrete, iron, or timber. Size and shape of the trough can vary; curved troughs are easily poured with concrete, while rectangle troughs are preferred by some as they hold coarse feed better during feeding.

The troughs are positioned near ground level and the inside wall should come up to the dulap of the average size cattle beast. An adjustable head rail is an advantage to prevent cattle standing in the troughs, and yet still provide maximum freedom for eating.

Water Troughs

One trough per pen is required when there are over 50 cattle per pen. Ideally the trough should provide 3 cm per head drinking space around the perimeter, and contain enough water for all the cattle in the pen under all weather conditions. A pen of 125 cattle weighing 500 kg per head can drink 10 000 litres per day.

Handling Facilities

For the efficient handling of cattle the following facilities are required:

Ramp—for loading and unloading vehicles;

Race and pens—for sorting and holding cattle;

Crush—for individual attention;

Scales—large and accurate for feed and cattle.

With these facilities cattle are sorted, dipped, drenched, vaccinated, identified, dehorned, castrated, and weighed.

Cost of Facilities

The cost of yards complete with handling facilities, using standard cattle yard materials, varies with the capacity of the feedlot. Based on 12 m² area per head, 125 head per pen, and feed being available to the cattle all the time, average costs would be:

- up to 1 000 head capacity: \$40 per head
- up to 5 000 head capacity: \$30 per head
- up to 10 000 head capacity: \$25 per head.

BUILDINGS

Office

Accurate records of rations fed, and the performance of each animal must be kept on the feedlot site for management appraisal. Regular weighings of the cattle each month can be valuable and a current inventory of the feed supplies is essential for future planning of requirements. Details of feed ingredients and ration formulations can also be filed in the office so that subsequent cattle performance can be recorded in comparison.

The office becomes the control centre for management where the performance and production data are collated and evaluated on the site.

Mill

This building complex is used to process the feed ingredients and prepare the ration ready for direct feeding to the cattle. The mill must have facilities so that feed ingredients can come in at the same time as the processed feed is delivered out.

Requirements of mill design and structure vary considerably according to the type of ration to be fed and the processing requirements of each ingredient. Details of processing methods and ration formulations by various types of mill equipment are beyond the scope of this paper.

Storage

The nature of the feed ingredients chosen for a ration determine the type and size of storage required. Silos are needed for grain and haylage (airtight if high-moisture is used), bins for supplements and concentrates, sheds for baled roughage, and pits for silage.

CONCLUSIONS

The facilities for profitable feedlot performance must be able to produce the best environment possible for the cattle. The design and construction should encourage the animal to use as much of its energy as possible for beef production. Good facilities are also essential for good management to become profitable in the feedlot enterprise.