

# Large Bale Self Feeder

*A centralized cattle feeding facility*

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More than half of all beef producers work off the farm full-time and many are the sole operator. This indicates that there is a need for time saving practices. Many scientific studies have shown that harvesting, baling, and storing hay can be tremendously inefficient. These studies show that there can be significant inefficiencies based on how many times the hay is moved, how it is fed, and where it is fed. Add to this the fact that cattle walking in mud require more feed and possibly even more hay may be wasted as it is comingled in mud. The result is that feeding cattle in winter is the largest cost of owning cattle.

Proper location and design of cattle feeding facilities can reduce the drudgery of farming for beef producers and provide a more productive environment for their cattle. The goal of a functional design is to create optimization and efficiencies that reduce inputs needed to produce cattle, while at the same time increase cattle productivity. The end result is higher profits for beef operations and less expended time. The Large Bale Self Feeder Project demonstrates a facility for storing hay, directly from a hayfield, that allows cattle to self feed. The design provides mechanisms for controlling mud. Moreover, it demonstrates work simplification and some of the basic principles of efficient material handling on a farm: Don't move it unless you have to (or move it as little as possible). Shorten distances. Let animals self feed. Handle larger amounts. Make every trip count. Eliminate small batches. Make flow continuous. Use machines to move materials automatically. Condense it. Change their shape for easy handling.

Access, location, shape, and dimensions are important attributes to consider when developing a functional design. However, other issues associated with climate, soil physics, work simplification, optimization, ergonomics, animal welfare, and engineering create a need to investigate a broader view in order to design better systems. The goal of feeding cattle large bale hay should be to create a system that lowers inputs, while creating an optimum environment for cattle. However, the structure should also complement the management of the entire operation, either by increased profits and/or improved efficiency of operations.

## Site Selection

- Site Selection is critical and cannot be stressed enough. Choose a site (summit position) that can serve multiple groups of animals in multiple pastures.
- A summit position offers the ability to drain water away from the site. It also limits the volume of water that could flow through the site.
- Facility access and location are critical for reducing time, labor, fuel, etc. The proximity to highways, residences, farm roads, and multiple cattle pastures indicates good access and location. Accessibility is equally important for the livestock as it is the producer. The site should be accessible to multiple pastures, close to hay storage, and near equipment sheds to reduce travel distances. Modeling shows that a centrally located facility is ideal for moving materials.
- A soil survey is the best place to start for background information. It is important to remember that the survey represents intrinsic properties. Overgrazed, graded, compacted, and eroded areas will have modified soil characteristics. Clay soils have more strength than sand and silt textured soils. Clay soils can also be compacted. Soil depth and depth to bedrock should be as deep as possible.

## Control Water

- Control water flow through the area. Select a site that is not in a floodplain, does not have a high water table, and does not have water running through the site.

## Buffers

- Nutrients and pathogens are present in runoff from winter-feeding areas. Select a site with well drained soils to provide infiltration to keep these materials on-site. However, once livestock compact the soils, infiltration is reduced. Therefore, have a thick stand of vegetation or ground cover downhill and surrounding the winter-feeding area to slow the flow of water to increase infiltration and keep nutrients and organic matter on the farm.
- Consider setting up an area that can be fenced off and managed as a flash grazing area. With this system, a producer could utilize nutrients, increase infiltration, and improve productivity.
- Verify setbacks from sensitive resource areas. Do not create a situation where runoff flows to sinkholes, creeks, ponds, or highways. Manage issues with distances of 300 feet and allow runoff to infiltrate and filter through grassed areas.



## Watering Facilities

- An off-site watering source (preferably not a stream or pond) is needed. If water and feed are offered in the same location, livestock have a reduced motivation to leave. The minimum distance from the feeding area should be 150 feet to encourage movement away from the feeding site.

## Orientation

- Orientation of feeding floor is to the south to allow sunlight to dry and sterilize the feeding floor.

## All-Weather Surfaces

- Multiple all weather surfaces are implemented to control the creation of mud, facilitate cleaning, and increase cattle welfare. These surfaces include concrete, geotextile fabric and rock, and plastic grid.

## Manure Utilization

- Routinely scrape manure and waste feed from the feeding area to protect the integrity of the feeding area. Store in a covered stack pad. Excess moisture and saturated conditions from built up manure can compromise a gravel feeding area.
- Manure should be managed to reduce inputs, build soil organic matter, and improve soil health.
- Manure should be applied when crops are growing and soils are no longer saturated.

## Ultimate Feeder

1. Should be suitable for use with any type of hay packages.
2. Should allow cattle to feed themselves with 24-hour availability but also provide limit feeding and reduce waste.
3. Should handle large volumes.
4. Should provide a comfortable feeding experience for the cow, where weather does not interfere with feeding.
5. Should be of moderate cost and pay for itself with hay and time savings in less than five years.
6. Should be convenient to use and not require the producer to enter the lot/field/pasture.
7. Reduces the number of times hay is moved and driving time.
8. Provides continuous flow.
9. Eliminates small batch feeding.