



# Backgrounding Facility Designs

Producers design feeding facilities for functionality.

by **Paige Nelson**, field editor

**A**ccording to Chris Hurt, Purdue University Extension economist, 2015 may see the lowest feed prices of the past five years. Kevin Good, CattleFax analyst, projects 2015 750-pound (lb.) feeder calves to range from \$195 to \$240 per hundredweight (cwt.) and average \$220 per cwt.

Cheap feed and profitable feeder-cattle prices make backgrounding calves — feeding them from weaning to a heavier weight prior to sending them to a feedlot — a tempting option. In the 2014 North Dakota State University Extension service workshop

“Backgrounding Cattle 2014,” area livestock specialist John Dhuyvetter said that with cheap feed and animals that perform, feeders could see costs of gain in the 60¢- to 80¢-per-lb. range.

Backgrounding is commonly a winter task and oftentimes requires feeding harvested high-forage rations in feedlot situations until the calves make the desired sale weight. Designing a functional backgrounding facility reduces feed waste significantly, which is the

backgrounder’s highest cost.

## Backgrounding facility design

In the feedlot, cattle require space away

**“A bed-pack barn was the space-saving solution for us as we considered the best way to take our calves to a heavier weight before selling them.”**

— **Brian Arbogast**



from herdmates. Those space requirements grow with the calf. The University of California Division of Agriculture and Natural Resources publication *Beef Care Practices* recommends confined cattle on dry dirt have 75 square feet (sq. ft.) of space per animal. In wet, muddy conditions, cattle can require up to 300 sq. ft. per animal.

Bunk space varies depending on feed availability. *Beef Care Practices* states that when *ad libitum* feed is available, only 6 inches (in.)-10 in. of bunk space is needed per animal. In limit-fed systems, 20 in.-30 in. is adequate. A sloped 6-ft.- to 8-ft.-wide concrete feed apron, where the cattle stand, may reduce mud accumulation near the feedbunk.

► **Above:** Arbogast Farms LLC of Harrisonburg, Va., chose to build a bedded pack barn due to its space-saving design.



► As a replacement for a barn that burned down in 2013, Mark, Brian and Brent Arbogast of Arbogast Farms LLC built a bedded pack barn designed to keep cattle out of the weather and dry, thereby reducing incidence of sickness.

► Arbogast's bedded pack barn is completely open to the east. Large doors on the north and south ends can be opened or closed, and a curtain on the west side can be raised or lowered.

University of California also recommends a 3% slope to the pens to reduce muddy surfaces, but too steep of a slope will accentuate surface runoff and accelerate erosion.

### Bedded pack barn design

An alternative to outdoor feedyard facilities are bedded pack barns. Also known as bed-pack or compost barns, bedded pack barns are designed to keep cattle out of the weather, thereby keeping them cleaner and healthier.

According to the 2011 South Dakota Technical Note *Beef and Dairy Bedded Pack Barn Planning and Design*, many different types of bedding can be used in this system: cornstalks, straw, soybean stubble and wood chips, for example. Bedding is usually added at regular intervals: every other day, once a week or as needed. Some producers clean out the bedded pack with each new group of cattle, while others allow the pack to accumulate for years. Most producers scrape manure from feed aprons every other day to once a week.

The South Dakota Technical Note offers these space requirements for animals in bedded pack barns:

- Beef cattle weighing less than 600 lb. require 25 sq. ft. per animal.
- Beef cattle weighing greater than 600 lb. require 35 sq. ft. per animal.

Advantages of the bedded pack barn vs. an outdoor feeding facility, according to the South Dakota Technical Note, are:

- higher animal densities per pen;
- collection, storage and application of open-lot waste runoff is eliminated;
- manure storage and application is less variable;
- less dust; and
- somewhat controlled climate inside the barn.

Disadvantages include:

- higher initial investment;



PHOTOS BY LAUREN HARTZLER ARBOGAST

- adequate bedding and adequate bedding storage requirements;
- ventilation management; and
- regular bedding and manure maintenance.

### Using the pack

When their feeding barn burned in January 2013, Mark, Brian and Brent Arbogast of Arbogast Farms LLC, Harrisonburg, Va., went right to work researching and building its replacement. By November, the commercial-Angus operation's new bed-pack barn was filling with weaned calves.

"In our county and across the state of Virginia, space is limited due to the natural landscape and sprawling city populations. A bed-pack

barn was the space-saving solution for us as we considered the best way to take our calves to a heavier weight before selling them," explains Brian.

Harrisonburg, according to U.S. Climate Data, boasts an average daily temperature of 52° F with an average 21 in. of snow and another 36 in. of rainfall, so keeping calves under a roof was an added bonus.

Arbogasts built a bedded pack barn 62-ft.-wide by 450-ft.-long, complete with cattle working facilities, two stalls, two loading chutes and an office. The barn has four cattle pens 52-ft.-wide by 100-ft.-long (not including the 10-ft.-wide feed apron) that house 90 calves each. This means each calf between 500 lb. and 800 lb. has 49 sq. ft. of space.

The naturally ventilated barn faces and is completely open to the east. The north and south ends are opened or closed with large doors. On the west side, the barn's lower half is solid with a retractable curtain on the top half.

"With this design, air quality is excellent due to the tremendous air turnover that can be

adjusted with the west curtain," says Mark.

The barn was built on a clay pad, and the Arbogasts use pine shavings as the bedded pack base. From there, wheat straw and corn fodder are used for bedding. Bedding is added once a week, the feed apron is scraped every two to three days, and total cleanout of each pen happens once a month.

**"I can have the snow cleaned out in 10 minutes and fresh feed laid on the ground."**

— C.L. Simper

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“In the barn, the calves are comfortable and warm,” the Arbogasts say. Additionally, thanks to the shelter overhead, fresh bedding, regular cleanouts and a proper stocking rate, the calves stay clean. On a ration of corn silage, ryelage, dry hay and grain, calves average 3 lb. average daily gain, the Arbogasts add.

### Seedstock facilities

For some, backgrounding is crucial to the seedstock process.

H.D. Dunn and Son Angus Ranch at Teton, Idaho, sell 18-month-old registered-Angus bulls and heifers. The calves are born in late spring, summered on mountain grass, then weaned into a feedlot Nov. 1. The calves are backgrounded in the feedlot until June 1, when they are put back on grass until sale time.

Prior to 2014, the ranch didn't have a feedlot facility, so bull calves were oftentimes shipped away for custom backgrounding. Ranch manager Ken Dunn says, throughout the years, the operation has gone back and forth about backgrounding the bull calves themselves or sending them off for the winter months.

After making some adjustments to their feed ration, the Dunn's found that the home ranch could feed the calves just as economically as anywhere else.

### Where corn doesn't grow

Located in scenic Teton Valley, Idaho, at 6,200 ft. above sea level, Dunn describes his locality as “a reasonably harsh environment.”

“Our ranch is in an area where we can get snow every month. We have a short growing season,” he says. According to the Western Regional Climate Center, the average daily temperature for the area is 40° F with an average snow depth of 4 ft.

In Dunn's climate, there aren't many forage crop options from which to choose. That being said, Dunn explains that on his ranch, like most ranches, feed is the No. 1 cost. The decision to self-background was always driven by cost, so before spending money on infrastructure, Dunn invested in an economical feed source.

“The first change we made was seeing if we could grow, in a cost-effective manner, a form of silage for feed. We've tried a few different ways, but we're slowly settling in on a beardless barley/oat combination,” says Dunn.

The ranch has also experimented with a waste-potato and straw silage, which has proven results comparable to corn silage. Along with the silages, the ranch also purchased a total mixed ration (TMR) mixer for combining varying qualities of hay with silage. Using the mixer, the silages and the hay,

Dunn backgrounded his heifers for five years before trying the system on his bulls. Before the feedlot, the mixed feed was laid on



the ground and a significant portion of the ranch's No. 1 cost was being wasted every day.

“The next logical step was building a feed facility where we could reduce the waste associated with feeding the cattle on the ground,” Dunn notes.

### Weather-resistant

C.L. Simper, herd manager for the ranch, designed the feeding facility with the weather in mind.

“I have a feed pad with a wall instead of troughs. The main reason for that is the snow. If you have a bunk, you're hand-shoveling it. With the way that I built this one, I can run down there with the backhoe. I can have the snow cleaned out in 10 minutes and fresh feed laid on the ground.”

The 6-ft.-wide feed pad is 12-in. higher than the apron.



PHOTOS BY PAIGE NELSON

► **Above:** As the cattle eat, they fling the feed out of their reach. Simper uses a rubber tire on his tractor to push it back within their reach and to remix the somewhat sorted feed.

► Instead of pouring feedbunks, H.D. Dunn and Son Angus Ranch of Teton, Idaho, poured a 6-ft.-wide feed pad that can be scraped clean from snow in 10 minutes.





“By lifting the feed side and keeping the other side down, your cattle are at a more natural angle to reach their feed, and they don’t get to pushing on their chest and neck,” Simper says.

Because there is no bunk, the cattle can spread the feed and fling it out of their reach. Simper uses a horizontal tire on his tractor-loader to push the feed back within reach of the cattle. The extra-wide feed pad keeps the tire level and out of the dirt and gravel.

Tetonia has a notorious mud season for which the feed pad compensates, explains Simper. When spring thaw occurs, Simper says the mud won’t bother him thanks to his wide feed pad because he has both inside tractor tires and the mixer tire on the concrete.

In trying to further minimize ruts along the feed pad, Simper laid down an 18-ft.-wide, 8-in.-deep gravel base. Furthermore, the entire feeding system is at a 1% grade away from the feed pad and drains into a catch pond.

There are two water troughs in each pen. Says Simper, no matter where a calf is standing, he is close to water. The water troughs are tractor tires plumbed with jetted float systems. Basically, explains Simper, there is a pin-sized hole at the bottom of the float pipe that constantly shoots a stream of water. Even when the float is off, says Simper, there is still a stream of water circulating the trough. The troughs have no heaters, but Simper says they won’t freeze.

“When we’ve been -40° F, those tires will maybe have just a little tiny bit of ice right around the outside, but they’ll never completely freeze over,” he states.

“I like the tires because on a cold, sunny day, those tires will attract heat and even keep it warmer. The cattle can rub on them. If they get a hole you can throw a patch on them,” he says.



► There are two water troughs in each feedlot pen. A tiny hole in the piping allows the water to constantly circulate throughout the trough. Even on the coldest days, Simper says, the tire troughs will not freeze.

Average pen widths vary, but all pens are 230-ft.-long, says Simper. Depending on the pen, there are 50-100 calves in each.

### Backgrounding to the bank

Although this is the first year the feedlot facility has been used, the feed wastage results are already calculated.

When feeding the ranch’s cows and heifers on the ground, Simper says, “I was feeding 30-40 lb. per day and I was losing 7-9 lb. per day.” Thanks to the environmental functionality of the new feedlot’s design, virtually no feed is wasted and feed sorting by the calves has been greatly reduced.

Dunn says having the cattle at home is not only more cost-effective, but it makes visual appraisal much easier and allows them to walk through the pens regularly, acclimating the calves to people.



**Editor’s Note:** Paige Nelson is a freelance writer and cattlewoman from Rigby, Idaho.



► “By lifting the feed side and keeping the other side down, your cattle are at a more natural angle to reach their feed, and they don’t get to pushing on their chest and neck,” Simper says. The feed pad is 6 in. higher than the apron.