Stocker Cattle Receiving Management

Stockering describes a management system that takes young, lightweight calves to a desired weight or adds weight to market cows and bulls. This is done primarily by using forage-based diets. After calves reach a desired weight or at the end of a grazing season, they are sorted into uniform groups and placed in feedlots or used as herd replacements. Market cows and bulls are often shipped to harvest after a stocker phase.

In general, most of the calves entering stocker programs are newly weaned, commingled with calves from many locations, deprived of feed and water for several days, and exposed to many diseases for the first time. Many bull calves are still intact, some calves still have horns, and many incoming stocker calves have never received adequate vaccinations. Stocker calves must adapt to new and different diets, adjust to new surroundings, establish a new pecking order, and get used to changing weather conditions.

Successful stocker operations have a plan that requires preparation before the cattle arrive. The receiving plan should include the following:

- well-designed facilities for ease of handling newly received cattle,
- a nutritional program to address the special needs of stressed cattle,
- a program designed to manage and care for sick or injured cattle, and
- personnel properly trained in identifying and handling sick cattle.

Receiving Facilities

Designing and maintaining effective facilities is the first step in planning a successful calf receiving program. Facilities should allow for a smooth, low-stress flow of cattle. Avoid square corners in facilities where cattle could crowd and injure one another. Curved lanes are more effective in moving cattle forward. When possible, include solid sides to fencing to minimize outside visual distractions to cattle. Design chutes to proper widths (28–30 inches)—not too narrow and not so wide that cattle can turn around.

Loading and Unloading

Stocker operations must have effective means to load and unload cattle from trucks and trailers (Figure 1). Loading and unloading ramp heights differ, depending on the type of trailers used (Table 1). Maintaining loading ramps of different heights or an adjustable-height loading ramp can facilitate a variety of calf transportation options. If tractor trailers are to be unloaded, ramps should be single file (30 inches for mature cattle) to accommodate the 30-inch-wide rear doors standard on most United States tractor-trailers. Ramps can be narrowed to less than 30 inches when only calves will be handled. Make sure ramps are no wider than the trailer opening so cattle don't strike the sides of the trailer during loading. Self-aligning dock bumpers and telescoping ramp panels are useful for blocking gaps from misaligned trucks.

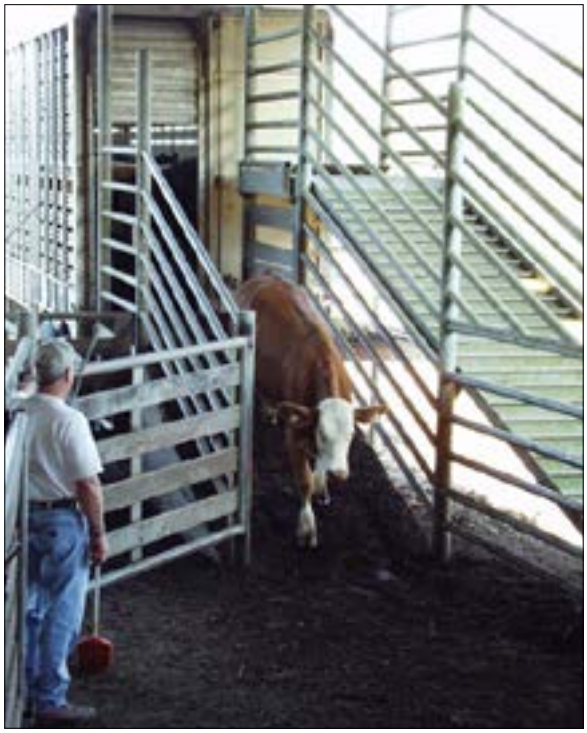

Figure 1. Unloading facilities for cattle receiving.

Table 1. Loading chute dimensions for cattle receiving and shipping.

Loading Chute	Dimensions
Width	26–30 inches
Length (minimum)	12 feet
Rise	3.5 inches per foot
Stock trailer ramp height	15 inches
Pickup truck ramp height	28 inches
Stock truck ramp height	40 inches
Tractor-trailer ramp height	48 inches
Double-deck trailer ramp height	100 inches

Adapted from Iowa State University (1987).

Cattle injuries can occur if unloading ramps are too steep. Target a loading ramp height of 20 degrees for a permanent ramp and 25 degrees for an adjustable ramp. Grooved stair steps are recommended for concrete ramps. Plan for steps to be 4 inches high and 12 inches deep.

Provide cattle with adequate footing in loading areas, particularly on loading ramps. Smooth concrete allows cattle to slip and possibly sustain injury, so concrete flooring should be texturized to provide traction. When portable or adjustable ramps are used, make sure they are firmly secured. Movement or wobbling of the ramp can cause cattle to balk when they walk on it. Remove any sharp, protruding, or distracting objects from the loading alleys that might injure cattle or cause them to balk during handling. Good drainage it also important, because it minimizes puddles and mud in receiving areas.

Sorting

From the unloading ramp, cattle will likely go directly to sorting pens for processing (unless they have traveled a long distance). More than one pen allows sorting into groups based on treatment needs, size, type, and any other classification that might be needed. Each pen should be large enough to handle the expected number of cattle. However, if a pen is too large, cattle can get by the handler during sorting. Make sure to have enough gates properly placed relative to the alleys and other pens.

Moving Cattle

After sorting, move cattle to the working area through an alley approximately 10–12 feet wide. As with large pens, an alley that is too wide leaves the cattle room to go around the handler. If the alley is too narrow, it could force temperamental cattle to go over the handler. This alley should end into a crowding pen or crowding tub that funnels cattle into the working alley. A common alley is often used to move cattle to and from the working area, but a second alley may be useful when processing large numbers of cattle in a relatively short period of time.

The working alley, which leads to the squeeze chute or headgate, should be at least 20 feet long to avoid delays in efficiently moving cattle. The width of this alley will vary, depending on the size of the cattle being processed. It should be wide enough for cattle to move forward without much resistance but not wide enough for them to turn around. Eighteen inches is a good width for calves but will not accommodate larger cattle. Some commercially available working alleys are adjustable. However, it might be more cost-effective to build a 22- to 26-inch wide working alley and hang spacers over the side when working smaller calves. As with the loading ramp, solid sides keep cattle moving forward without balking at motion or noises outside the chute.

The least expensive way to create a working area is to securely attach a headgate to the end of the working alley. This does not give much control over the calf as it is being processed. Commercial squeeze chutes effectively restrain cattle, improve processing efficiency, and increase overall safety. One of the most important considerations in buying or building a working chute is the ability to give all injections in the neck. Make sure this can be done quickly and, most importantly, in a way that does not put the handler's arm in danger of being injured.

Inspecting New Cattle

Closely inspect calves upon arrival for overall health, condition, and quality. Cattle often arrive or ship outside of daylight hours. Lighted facilities make cattle receiving inspection easier after dark. If calves are deemed unacceptable based on the transaction agreement, contact the seller to renegotiate the deal or to notify that the calves will be reloaded for return shipment.

Having a set of scales available in or near the receiving area is useful for determining cattle weights to calculate shrinkage upon arrival. Knowing shrinkage can help identify groups of cattle with potential health problems by indicating the extent of marketing and shipping stress undergone by newly arrived cattle. Additionally, if weights of newly arrived cattle differ drastically from expectations, it may indicate how well the cattle were represented by the seller. Depending on how the cattle will be marketed at the end of the stockering phase, it might also be useful to have certified scales on site. Scales are certified by the Weights and Measures Division of the Mississippi Department of Agriculture and Commerce.

Holding Pens

Border holding pens with sturdy fences. Wood or metal pipe are good materials for building receiving area fences (Figure 2). Fences should be at least 50 inches tall with posts set deep enough into the ground to withstand cattle's crowding into the fence without the posts or fence moving.

Figure 2. Sturdy fences are essential for receiving cattle.

Design and manage receiving pens to house cattle with plenty of space for each animal. Provide at least 14 square feet of pen space per head of calves and 20 square feet of pen space per head of mature cattle. Provide adequate shade in receiving pens, particularly during warm, humid weather (Figure 3). Strategic placement of feed troughs and water tanks in receiving areas is discussed in the nutritional management section later in this publication.

Communication

Gather contact information in advance for truckers who will haul cattle to the stocker operation. Being able to find out when a load of cattle will arrive lets the stocker operator make arrangements for personnel to be on-site at the receiving area to meet the truck upon arrival. Open lines of communication with cattle haulers may also be useful for fine-tuning directions to unloading facilities and to determine if cattle loads are ahead or behind the scheduled arrival time. Observe cattle haulers and stocker operation personnel during cattle unloading, and be sure all cattle handlers practice good animal husbandry.

Receiving Nutrition Programs

A well-designed nutritional program is a vital part of a successful stockering enterprise. The receiving phase is a unique and challenging period in a calf's life. Proper nutritional management of stocker calves at receiving is fundamental in improving stockering profitability.

Receiving Diets

Newly received calves typically have decreased feed and water intake from one day to several days. Upon arrival, calves should be placed in small lots with adequate shade and clean water. Calves over 400 pounds will likely be able to easily recognize and consume hay. They should have access to good-quality grass hay to stimulate proper rumen function (Figure 4). Let the calves shipped from long distances rest upon arrival, and plan to process them the next morning.

Figure 3. Calves housed in a receiving pen with shade access.

Figure 4. Calves with access to a palatable receiving diet with hay included.

Calves must be able to quickly recognize and consume feed. On average, feed intake of newly received calves is low. Because of this, diets for newly arrived stocker calves should be formulated to maximize intake and provide greater concentrations of required nutrients. Receiving diets must be highly palatable, stimulate intake, provide acceptable levels of critical nutrients, and minimize the potential for nutritional disorders. Generally, receiving diets that contain more than 55 percent concentrate can lead to digestive problems, resulting in higher medication costs.

It is important to know which feedstuffs are helpful in recieving diets. Although cottonseed hulls are relatively low in nutrient value compared to other feedstuffs, they can serve as a good fiber source or "scratch" factor to stimulate gut movement and reduce the risk of acidosis. Cottonseed hulls are generally very palatable to cattle and can work as an appetite stimulant, as well. Pelleting ingredients, such as soybean meal, minerals, and other additives, can promote intake as long as the pellets are not too hard or large (diameter of pellet should be ½ inch or less). Pelleting roughages reduce the "scratch" factor, so any pelleted diet needs to include at least 2–3 pounds of long-stemmed hay per day.

Diet formulation should take the age and size of the calf into consideration. As a general rule of thumb, receiving diets should be formulated so the calf receives maintenance requirements for protein, vitamins, and minerals when feed consumption is 1.0 to 1.5 percent of body weight. Lightweight (350 pounds or less) and early-weaned (at or before 4 months of age) calves may need more nutrient-dense diets than larger, later-weaned calves. These lighter calves require a higher percentage of protein and a better source of digestible energy in their diets than do larger calves.

For lightweight calves, a diet with free-choice hay as the main ingredient is not as effective as a complete, mixed diet that contains higher levels of concentrates. A complete, mixed diet for lightweight calves has the added advantage of reducing the possibility of calves' sorting roughage from grain. If ground hay is used in a mixed diet, it should not be over-ground. Leave 1½- to 2-inch stem lengths and, if needed, add molasses to control dust.

The source of protein is also critical in receiving diets. Non-protein nitrogen (urea) is not recommended in receiving diets for calves less than 600 pounds and should be avoided altogether for feeding lightweight calves. Plant protein sources such as soybean meal, cottonseed meal, and alfalfa are acceptable protein supplements for these calves. For young calves, soybean meal is preferable to cottonseed meal because of the potential for problems with gossypol from cottonseed meal, particularly in calves less than 400 pounds.

Providing proper salt and mineral supplementation is an essential component of a good nutritional program for stocker calves. Phosphorus levels are typically low on forage-based diets, so next to sodium and chloride, phosphorus is a key mineral to supplement to balance the diet. Trace minerals such as zinc and copper, along with vitamins A and E, are also important in meeting the nutritional needs of stocker calves.

Nutritional Considerations for Stressed Calves

Stressed calves have special nutritional concerns. Stress places demands on the bodies of calves that can result in performance losses. Common stresses on young cattle include weaning, handling and hauling, feed and water deprivation during the marketing process, exposure to temperature or weather extremes, and processing practices, such as dehorning, castration, and vaccination. Crowding and disease exposure are additional stressors often associated with commingling feeder calves. Drought is another stressor for growing cattle.

Nutrition and stress are closely associated. Nutritional deficiencies in protein or energy can stress calves. Likewise, environmental stressors can produce or intensify nutritional deficiencies. Stocker cattle operators should consider practices to minimize stresses as well as methods of coping with the effects of stress on calves. This publication highlights many of the recommendations the National Research Council reports for stressed calf nutritional programs.

Rumen fermentation involves microorganisms such as rumen bacteria, protozoa, and fungi. This process is a critical part of the digestion and use of feedstuffs in stocker calves. Newly arrived calves to a stocker operation likely have undergone periods without feed and water during the course of marketing and shipping. Rumen fermentation processes and capacity are decreased by feed and water deprivation and remain depressed for a few days after calves regain access to feed and water. Rumen microorganism levels drop sharply after calves are stressed. When transportation stress is added to the stress from feed deprivation, longer recovery periods are needed for rumen microorganism levels to return to normal. These ruminal changes result in decreased calf appetite and feed intake.

One of the most challenging management problems resulting from stress on calves is lowered feed intake. Feed intake decreases by more than 50 percent in calves experiencing respiratory disease and fever. It is often difficult to meet nutrient requirements in calves suffering from bovine respiratory disease complex because of the

dramatic reductions in feed consumption. It sometimes takes up to 2 weeks for calves to resume normal feed intake levels after the start of respiratory disease. Low feed intake is of particular concern when using medicated feed additives requiring adequate intake of medication for effectiveness against conditions such as coccidiosis.

While protein and mineral requirements of stressed calves may not differ from nonstressed calves, protein and mineral supplementation levels may need to be increased with stressed calves to compensate for reduced feed intake. Increasing diet nutrient density helps supply adequate nutrient levels when feed intake is depressed. Receiving diets for lightweight, stressed calves should target 13.5 to 14.5 percent crude protein on a dry matter basis to meet protein requirements. In cases of severe intake depression, dietary dry matter protein levels may need to approach as high as 24 percent crude protein.

Much of the shrink or weight loss common with calf marketing, shipping, and processing is water loss. Longer transits increase weight loss and calf stress. Body water loss (as opposed to rumen water loss) can increase mineral loss and, combined with low feed intakes, lead to mineral deficiencies. In cases where shrink is more than 7 percent, nutritional programs for stressed calves should include 1.2 to 1.4 percent potassium in the diet for 2 weeks after arrival. Additionally, high concentrations of zinc have been shown to benefit calves suffering from illness. Suggested zinc concentrations for stressed calves are 75 to 100 parts per million (ppm) of dietary dry matter. Vitamin E and selenium are also involved in immune function. During the receiving period, vitamin E should be fed at levels between 400 to 500 IU (international units) per head per day. Later, at least 100 IU of vitamin E with 0.1 ppm Se per head per day should be provided. Supplementation of B vitamins such as niacin has also been shown to improve performance of stressed calves. Daily niacin supplementation of 125 ppm for healthy calves and 250 ppm for sick calves can be beneficial.

Health problems can occur in calves when diet energy content is either too high or too low. Low-energy diets may reduce immune function. High-energy diets can also contribute to health problems, but hay supplementation of high-energy diets for 3–7 days can alleviate these problems. Hay offered to calves should be good-quality grass hay.

Stressed calves have a very low tolerance for fat in the diet. Receiving diet fat content should not go over 4 percent of the dietary dry matter. Commonly used feedstuffs containing relatively high fat levels include whole cottonseed, dried distillers grains, and rice bran (unless it has been defatted). Reduced feed intake and scours can be expected with excessive fat supplementation.

Some feedstuffs are better for stressed calves than others. Stressed calves do not respond to non-protein nitrogen (urea) in the diet as well as nonstressed calves. Some suggestions are that increasing rumen bypass protein supplies can increase performance of stressed calves, but research results are mixed. Soybean meal is generally considered a much better source of rumen bypass protein than cottonseed meal. Avoid heat-damaged feeds for stressed calves, because they may have reduced levels of protein available for the animals to use. Another feed-related factor to consider when receiving stocker calves is that newly arrived calves often prefer dry feeds over wet feeds, such as silages. However, calves will adapt to high levels of high-moisture feeds such as corn silage in 1–2 weeks.

Feeding Management

Good management can help newly arrived calves get on feed as quickly as possible. Calves initially walk the boundaries of their new pens searching for a way to escape. Placing feed bunks and water troughs along the fence lines of receiving pens, as opposed to in the center of the pens, increases the frequency of calves' walking past the bunks and troughs (Figure 5). Therefore, calves find water and hay easier if they are placed around the fences. Using trainer or lead cattle to show newly arrived calves the locations of feed and water can also be effective.

Figure 5. Placement of feed bunks along a fence line.

Adequate bunk or trough space is another important consideration in receiving pens. Timid calves may not receive sufficient shares of feed if bunk space is limiting. At least 12 linear inches of bunk space per head is recommended for incoming cattle. A good guideline is to provide 18 to 24 linear inches of bunk space per calf. This

limits crowding at the bunk and allows timid cattle more of an opportunity to feed.

Feed cattle approximately the same time each day to establish a routine, consistent eating time. Twice-a-day feedings can be worthwhile the first 2–3 weeks of the receiving period for highly stressed, young, or lightweight cattle. Sick calves may be slow to come to the feed bunk, so it is useful to observe feeding behavior to help identify potential health problems. Clean feed and water troughs before calf arrival and then closely monitor troughs. Remove any moldy feed, fines, chunks of caked or damaged feed, manure, or trash from feed supplies offered to calves. Finally, implement diet changes gradually after receiving.

Receiving Health Programs

Young, stressed calves from multiple sources that have already been exposed to a multitude of infectious agents pose a challenge to the stocker operation. A good health program starts with close adherence to management advice on nutrition, facility design, and care outlined throughout this publication. Specific disease prevention and treatment protocols should be designed for each operation based on management, the type of cattle purchased, and goals.

Low-Risk versus High-Risk Cattle

Characterize or divide calves into two groups: low or high risk. A low-risk group might be from a known source, castrated, dehorned, with some exposure to vaccination (a preweaning health program), or even physically thrifty calves that might lack previous treatments but are from a nearby location (farm fresh). High risk implies commingled calves with extensive exposure to disease, stressful conditions (such as extended travel or inclement weather), and perhaps poor physical condition.

Basic health recommendations or general guidelines are appropriate for most stocker cattle operations, but there is no perfect treatment or vaccine. In addition, poor timing or improper administration can make many vaccines and treatments ineffective. Many calves, specifically high-risk calves, are sick or at least incubating a disease at arrival. Although their treatment is important, it is much more important to decrease disease exposure to other cattle. Clinically ill calves shed high numbers of pathogens (disease-causing agents) at arrival. If new (both healthy and sick) calves are arriving over days or weeks, exposure to disease can be continual. Because of this, it is a good idea to limit the time frame for putting a group of calves together. The all-in, all-out schemes commonly used in poultry and swine operations are best but rarely possible. Most efforts are, instead, aimed at reducing the spread of disease and lowering its impact. Health risks cannot be eliminated.

Unless cattle have traveled a long distance, process them immediately upon arrival. In the case of calves hauled long distances, allow them to rest, drink, and eat before processing. Avoid processing cattle during extreme heat and adverse weather conditions. Minimize stress during processing by removing dogs, electric prods, and loud noises from the calf processing area. Follow Beef Quality Assurance guidelines with respect to vaccine or medicine handling and injection technique. Injury to the tissues at the injection site from improper vaccine handling or administration can impact absorption of an antibiotic or effectiveness of a vaccine.

For low-risk cattle, perform the following:

- Deworm
- Vaccinate for infectious bovine rhinotracheitis (IBR), bovine viral diarrhea (BVD), parainfluenza-3 (PI-3), and bovine respiratory syncytial virus (BRSV) using modified live vaccines
- Vaccinate for blackleg (7-way Clostridial) using dose according to label
- Test for persistently infected BVD
- Ear tag with unique animal identification
- Implant with growth-promoting compounds
- Castrate and dehorn

For high-risk cattle, perform all of the above. Additionally, consider the following based on veterinary advice:

- Mass treat with an antibiotic (metaphylaxis)
- Inject heifers with prostaglandin F2-alpha
- Remove clinically sick calves and place in a separate location (hospital pen)
- Keep calves isolated in hospital pens

Identify Sick Calves

Early recognition of sick calves is important because they expose others to disease and because treatment success is better the earlier in the disease process it occurs. Identifying sick calves early is a developed skill—more "art" than science. Cattle do not make this easy, because it is their instinct to stay with and blend in with the herd. The best time to watch calves is around feeding time. Identify sick calves, sort them out, and move them to the hospital pen (Figure 6). This area should allow easy, stress-free treatment, with good access to feed and water. Good recordkeeping is essential. Take rectal temperatures to help determine whether the right calves are being identified early enough and "pulled." However, do not go strictly by the calf's temperature. If calves appear sick (exhibit nasal

discharge, labored breathing, or unthrifty appearance) or are not eating, treat them (Figure 7).

Discuss with a veterinarian different treatment protocols. Most management schemes use a certain antibiotic for mass treatment, another for first pulls, and others for nonresponders. A veterinarian can also provide advice on the use of anti-inflammatory drugs and other potentially beneficial medications. Finally, have necropsies performed on calves that die. Necropsies are an extremely valuable diagnostic tool. A necropsy can often provide a diagnosis and allow for better prevention or treatment strategies.

Conclusions

Young, growing calves are one of the most challenging classes of cattle for which to plan nutritional and health programs. Planning for stressed calves is even more critical. Stocker management should arrange for effective stocker cattle facilities, nutrition, and health programs before calves arrival. For more information on stocker cattle receiving programs, contact your local MSU Extension office.

Figure 6. Cattle isolated in hospital pens.

Figure 7. Calves exhibiting signs of illness.

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Publication 2506 (POD-04-21)

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