

Facilities for Artificial Insemination of Beef Cattle

One of the challenges producers cite in implementing an artificial insemination (AI) program is access to functional facilities. Facilities can make working cattle a breeze or a burden depending on design and use. Time, labor needed, exposure to the elements, and ease of cattle movement are all concerns when considering facilities for an AI program. Breeding large numbers of cattle can be a hardship if cattle do not move quickly and calmly through the system. With well-designed and properly used facilities, cattle will flow smoothly through a chute or breeding barn, reducing the overall time spent to inseminate a herd.

Protection from the elements

When implementing an AI program, protection from extreme weather is an important consideration. When using a timed AI protocol, cows cannot simply be bred on a different day due to rain or snow. Sperm are very sensitive to temperature shock, water, and light. Therefore, sperm viability can be greatly reduced if semen is exposed to the elements during the catheter preparation and AI process. Providing cover from the elements for the person thawing as well as the inseminator, can mitigate some issues with sperm viability if weather is not ideal. Using a carport or barn to cover the chute is an option to limit the impacts of weather on the semen. Thawing semen in an enclosed space like a breeding lab or shed is an option to control the temperature as well as avoid exposure of the semen to light, dust, and rain. In addition, having a covered handling system and working cattle in the early morning during breeding seasons in the warmer months can mitigate reduced pregnancy rates due to heat stress.

Chute and headgate

Artificial insemination can also be safely performed in a standard chute or in a headgate and alley setup,

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Figure 1. Carson Andersen, Graduate Research Assistant in the Division of Animal Sciences at the University of Missouri, artificially inseminates a heifer in a squeeze chute. Adequate animal handling facilities are essential in carrying out an artificial insemination program.

with some considerations. A squeeze chute is preferred to limit movement of cattle during the AI process (Figure 1), although this is not always necessary. Because heifers may be less acclimated to facilities and to human interaction that mature cows, heifers may be more likely to move during the AI process. For this reason, technicians often prefer squeeze chutes or a narrower alley width when artificially inseminating heifers.

When AI is performed in a chute, a palpation cage is preferred rather than attempting to perform AI through a side opening of the chute. Inexperienced technicians often struggle to perform AI through the side of the chute rather than from directly behind the animal, and this positioning through the side of the chute is also more likely to result in shoulder injury if the animal backs out of the headgate. Additionally, placing a bar or chain behind the animal as an additional safety

precaution is encouraged, as this limits chances of being kicked or backed into by the animal.

Low-stress handling and facility design

Low-stress animal handling should be a priority at all times and carefully monitored during any AI program. Personnel handling cattle should be aware that animal stress up to and around the time of AI can detrimentally impact pregnancy rates. If extra labor is brought on for animal handling on the day of AI, care should be taken to make sure that all personnel are aware of the stockmanship expectations of the farm or ranch.

Low-stress animal movement should be a priority not only in the facilities leading up to the chute or the breeding barn, but also when cattle are first gathered out of pasture or pens. Handling of animals prior to AI can dramatically influence their willingness to stand calmly during the AI process. Overcrowding tubs or pens, using electric cattle prods, and yelling or making other loud noises are strongly discouraged.

Well-designed and properly used facilities reduce stress on cattle. Low-stress animal handling facilities that can work well with a chute or breeding barn do not have to be expensive. The “Bud Box,” popularized by the late Bud Williams, is just one example of a relatively low-cost handling facility design that can facilitate low-stress handling of livestock (Figures 2 and 3). The alley leading to the Bud Box is generally designed to be 10 to 14 feet wide depending upon cattle temperament and depending upon whether cattle are handled on foot or horseback. Note that the width of the alley does not dictate the width of the Bud Box. Cattle may actually flow more easily into a Bud Box when width

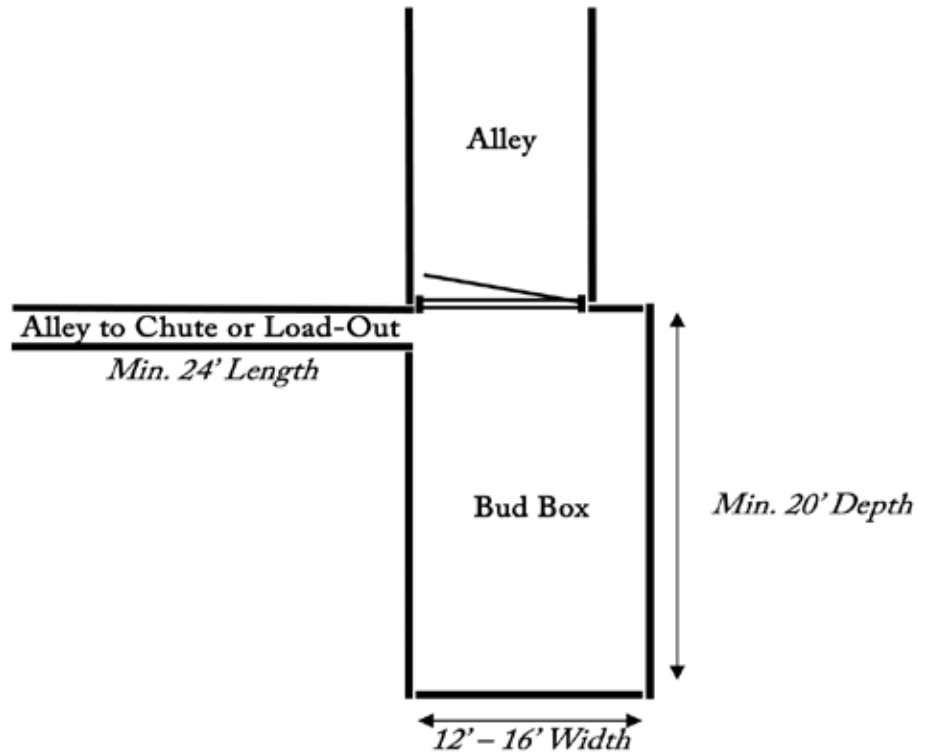


Figure 2. Illustration of a simple Bud Box system to facilitate low-stress handling of cattle.

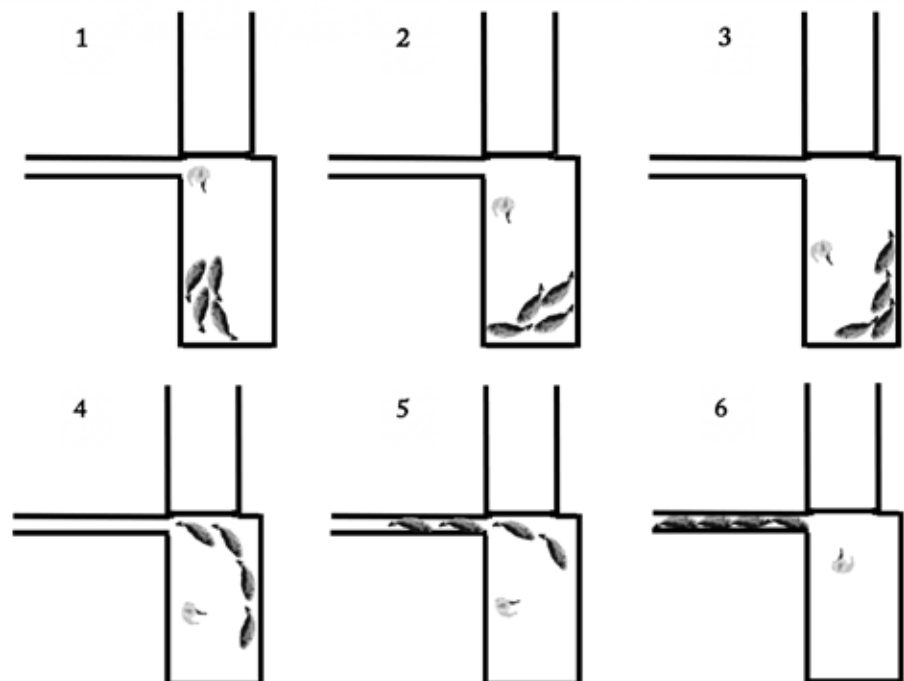


Figure 3. Illustration of low-stress flow of cattle achieved through simple body positioning in a Bud Box handling system.

of the Bud Box is slightly larger than width of the Alley. The Bud Box should be 12 feet in width if cattle are handled on foot or 16 feet in width if cattle are handled on horseback. A width of 14 feet may be workable if cattle will be handled on foot on some occasions and on horseback on other occasions. Depth of the Bud Box should be a minimum of 20 feet, although deeper Boxes (e.g., 24 feet) may be preferred if the alley to chute or load-out is high-capacity. Bud Boxes designed for loading out large trailer loads of cattle can be designed with even greater depth (e.g., 30 feet). The Alley to Chute or Load-Out should have a capacity that exceeds that of the Bud Box, such that all animals entering the Bud Box flow through in a single draft. A straight alley of at least 24 feet is recommended. A double alley design is preferred by some, especially to increase alley capacity where potential alley length is limited

Regardless of the facility, personnel handling cattle need to understand how to effectively use the facilities in a low-stress manner, as any facility is only as good as its operators. Figure 3 illustrates low stress handling of cattle in an example Bud Box facility through simple use of body positioning.

For more information on the impacts of handling and stockmanship on cattle stress and reproduction, see MU Extension publication G2047, [Managing the Effects of Stress and Temperament on Beef Cattle Reproduction](https://extension.missouri.edu/publications/g2047) (<https://extension.missouri.edu/publications/g2047>).

Portable breeding barns

A portable breeding barn (Figure 4) can be a good option to AI cattle in a low-stress, efficient manner. University of Missouri Extension has 13 single- or two-stall breeding barns located around the state. These breeding barns can be backed up to a lead up alley. This makes them a good option for farms without squeeze chutes or with chutes that lack palpation cages. In addition, using an enclosed breeding barn can provide protection from harsh weather conditions for locations at which cattle handling facilities are not under-roof.

The barns are floorless and are raised or lowered by a built-in hydraulic pump, allowing cattle to keep their feet on the ground instead of stepping up onto a chute platform. Cattle enter through the sliding back door. The breeding barns keep cattle quiet with little restraint,



Figure 4. Portable breeding barns available through University of Missouri Extension can facilitate an artificial insemination program. Barns can be backed up to a lead-up alley. A sliding rear door allows for cattle to enter. Two-stall breeding barns can allow for two technicians to perform artificial insemination of two cows simultaneously, speeding up the breeding process in large herds. When AI is completed, pulling a cable opens a front door, allowing cattle to exit.

using a bar that drops behind the cattle to prevent cattle from backing up or kicking the AI technician. Furthermore, each stall is equipped with rubber curtains to block the cow's view of bright lights or technician movement.

Two-stall breeding barns allow two technicians to be working at the same time, making the AI process of

large herds much more efficient. Further, cattle remain calm while standing next to another cow in the two-stall breeding barns. These breeding barns are rented to producers across the state and are easily moved by a half-ton pickup. For more information on renting a breeding barn, contact information for breeding barns across the state is provided in Table 1.

Table 1. Portable breeding barns available through University of Missouri Extension.

Northeast		
Northwest	North Central	Novelty
Albany	Milan - Brookfield	Adair County Extension
Gentry County Extension	Sullivan County Extension	Two two-stall breeding barns
One two-stall breeding barn	One two-stall, one single breeding barn	Daily rental fee: \$75
Daily rental fee: \$50	Daily rental fee: \$75 for double or \$50 for single	To reserve: 660-665-9866
To reserve: 660-726-5610	To reserve: 660-265-4541	Palmyra - Bowling Green
		Ralls County Extension
		One two-stall, one single-stall breeding barn
		Daily rental fee: \$75 for double or \$40 for single
		To reserve: 573-985-3911
West Central		
Harrisonville	Central / West Central	Central / East Central
Cass County Extension	Sedalia	Fulton
One two-stall breeding barn	Pettis County Extension	Callaway County Extension
Daily rental fee: \$75	One two-stall breeding barn	One two-stall breeding barn
To reserve: 816-380-8460	Daily rental fee: \$75	Daily rental fee: \$50
	To reserve: 660-827-0591	To reserve: 573-642-0755
Southwest		
Mount Vernon	South Central	Southeast
Lawrence County Extension	Salem	Jackson
One two-stall breeding barn	Dent County Extension	Cape Girardeau County Extension
Daily rental fee: \$75	One two-stall breeding barn	One two-stall breeding barn
To reserve: 417-466-3102	Daily rental fee: \$50	Daily rental fee: \$50
	To reserve: 573-729-3196	To reserve: 573-243-3581