

UW Marshfield Agricultural Research Station

Quick escape D-bar

1/4/16

Livestock pens housing dairy animals in modern facilities are commonly built with an escape exit for humans, called a "man-pass". The man-pass is a narrow walk-through built within the exterior gating of the pen. It is a safety feature that allows a person working in a livestock pen a quick exit from the inside of the pen in the event the worker feels threatened by an animal yet it is too narrow to allow a heifer or cow to pass through.

From an occupational safety standpoint, the man-pass is a necessary addition to a livestock pen. At the UW Marshfield Agricultural Research Station farm, there are over 56 man-passes throughout the research facilities. Commonly, during animal movement, some dairy animals attempt to use the man-pass. With a dairy animals' poor vision, the opening of a man-pass appears as a large enough opening for the animal to walk through. This occurs most often when animals are moving in the drover's alley, which border animal pens. The man-pass is too narrow for a large heifer or a cow to fully pass her body safely through. When she does attempt to pass through, she feels the physical pressure of the posts and continues a forward motion becoming wedged further between the posts. This situation can result in an animal becoming dangerously stuck and can cause serious injury to the animal if she is not removed in timely manner. Sometimes, the posts must be cut to free the wedged animal.

Livestock producers with this conundrum may choose to partially or entirely cover the man-pass with plywood, chains, or boards. Unfortunately, covering the man-pass negates the purpose of the man-pass as a safety feature for the worker.

To address this issue of animals getting stuck in man-passes, UW MARS staff tried to solve the problem. Pipe was welded in the shape of a D (aka D-bar) and then clamped to a post of the man-pass to decrease its width (passable space). The D-bar prevented animals from entering the man-pass but created a new problem as not all staff fit between the smaller widths of the man-pass made by the welded D-bar. This was more of a problem in winter when staff wears bulkier clothing to keep warm.

UW MARS staff was challenged to design a D-bar type device that would meet the safety needs of the worker but not introduce risk of injury to an animal. Several D-bar modifications were tested for utility. Finally, MARS employees Scott Fischer and Steven Roberts came up with a design for a quick escape D-bar using a lift and push/pull mechanism.

The design is something producers can easily fabricate and reproduce. Hinges were made from 5" of 1/2" inside diameter pipe, cut in two 2 1/2" pieces. A 3/8" square Z-notch was cut so the two 2 1/2" pieces would interlock together. A 7/16" machine steel rod*, used as the pin hinge, was cut to 6". One end was welded into the top half of the 2 1/2" hinge pipe. This assembly was welded to an 8" armbar. A hole was drilled into the pin, about 1/4" from the bottom end. A cotter key was inserted in the hole as a safety lock to keep the bar secured to the hinge. The bottom piece of hinge pipe was welded to a 4" strap clamp fitting a 4" barn post. The 2 1/2" pipe hinges were welded close to the bolt end the strap clamp to keep the ears of the strap clamp from extending into the man-pass.

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Top and bottom hinge assemblies were welded to a 48" piece of 1/4" pipe, the vertical D-part of the gate. It is important in the construction of this style of man-pass to keep everything as square as possible to allow hinges to move freely.

Regular preventative maintenance is strongly suggested when using the Quick escape D-bar to ensure the steel rod moves freely vertically and as it hinges. Suggested preventative maintenance includes removing any rust or debris that may cause the hinge mechanism to fail to fully move and regular lubrication of the steel rod hinge.

*A 3/8" steel rod could be used instead of the 7/16".