

# MIFACE INVESTIGATION REPORT: #14MI014

## SUBJECT: Dairy Farm Worker Mauled by Either a 2-Year-Old Bull or a Dairy Cow

### Summary

In spring 2014, a dairy farm worker in her 40s was mauled by either a 2-year-old bull or a dairy cow. The farm worker was herding approximately 50-60 dairy cows from a freestall area (where the cows eat and stay when not being milked) into a holding pen before they enter the parlor for milking. The bull had been raised by the owner's family on the farm and freely roamed with the dairy cows. The event was unwitnessed. The owners of the farm and a family member were in the front of the barn; one of the owners was tending to a sick cow and the other owner and family member were in the break area when they heard the cows bellowing. The three of them stepped



Figure 1. Bull which may have been involved in the incident

out into the feed aisle and saw the bull in the feed aisle walking toward them. The bull was herded without incident to another stall. One of the owners found the worker lying face down and unresponsive under a stanchion; with the upper body found in one stall and lower body in another stall. The owner rolled the worker over and began CPR while emergency response was summoned. The worker was declared dead at the scene.

### Contributing factors:

- Bull freely roaming with dairy cows
- Worker entering stall to encourage reclining cows to stand and exit stall
- Possible underestimation of bull and cow aggressive behaviors
- Working alone with bull in dairy cow freestall
- Cubicle design/freestall design may not have had room for cow movement and employee escape
- Possible employee complacency when working around the animals and/or was distracted by other animal behaviors

## **RECOMMENDATIONS**

- Establish worker rules/procedures and acceptable work practices for anyone (employee & family) working around dairy animals specific to the farm operation. One work practice should be that workers prompt animal movement from the resting position in a partitioned freestall from an empty freestall next to the animal being directed.
- Train workers/family members to recognize animal health issues and attack scenarios and behaviors.
- Ensure the freestall design permits cows to easily stand up when lying down in the stall to avoid animal handling & comfort issues.
- Workers should not be permitted to be in a pen with a bull alone and should maintain constant awareness of the location and behavior of bulls when entering a holding pen.
- Consider using artificial insemination, not a natural service bull, to impregnate cows.

## **BACKGROUND**

In spring 2014, a dairy farm laborer in her 40s was mauled by either a 2-year-old bull or a dairy cow. MIFACE researchers learned of this fatality from the MIOSHA 24-hour hotline. The researcher contacted the dairy farm and the owners agreed to participate in the MIFACE research. The MIFACE researchers visited the site and spoke with the owners and one of their family members. The researchers were also accompanied on a farm tour. During the writing of this report, the death certificate, medical examiner and police reports and the MIOSHA compliance officer file were reviewed. Pictures used in this report were courtesy of the responding police department. Pictures were altered by the MIFACE researcher to preserve anonymity.

The employer was a dairy farm, which had been in operation for 30 years. They had seven laborers and three family members who worked the farm. They raised approximately 250 dairy cattle, and grew the feed for the cows. The decedent was a full-time hourly worker who had been employed at the farm for approximately 9 years. Her shift began at 11:15 a.m., and concluded at 7:30 p.m., six days per week. The employee had approximately 30 years of experience in the dairy industry. The farm did not have a written safety program, but had provided verbal instructions to their employees. Employees had received training from both the farm owners and the decedent regarding how to perform their work; for example skid steer operation, milking procedures, etc.

### *Remediation Actions Taken After the Incident*

The farm sold the bull and is now using artificial insemination to impregnate the cows.

MIOSHA General Industry Safety Division issued the following Health and Safety Recommendation to the farm at the conclusion of its investigation:

“An inspection of your worksite revealed the following condition(s) which may constitute a safety or health hazard to your employee(s): Protect employees from injuries from a bull and other livestock by ensuring there is a barrier like a tractor or fence to prevent the animal from being in the same area as the employee. Develop other procedures to limit exposures to the hazard while allowing employees to do their work with animals.”

## INVESTIGATION

The incident occurred at approximately 2:00 p.m. At the time, the dairy used a de-horned natural service bull to impregnate the cows. The owner indicated that since not all cows conceive with (take to) artificial insemination they have one bull that roams with the cows. The 2-year-old bull had been hand-raised by the family and their farm workers. The owner indicated the bull had never shown any aggressive behaviors toward the owner’s family or the hired farm workers. The bull was allowed to routinely mix with the cows, both outside and inside of the barn.



Figure 2. Freestall barn area leading to dairy milking parlor

Three times a day the cows were brought into the milking barn and placed in one of four freestall pens. Three of the freestall pens held 50-60 cows and one held 15-20 cows. The freestall pens were pens inside the barn where the cows could move around, eat and drink prior to being milked. When it was milking time, an employee herded the cows into a smaller holding pen until it was time for the cows to be taken to the milking parlor (Figures 2 and 3).

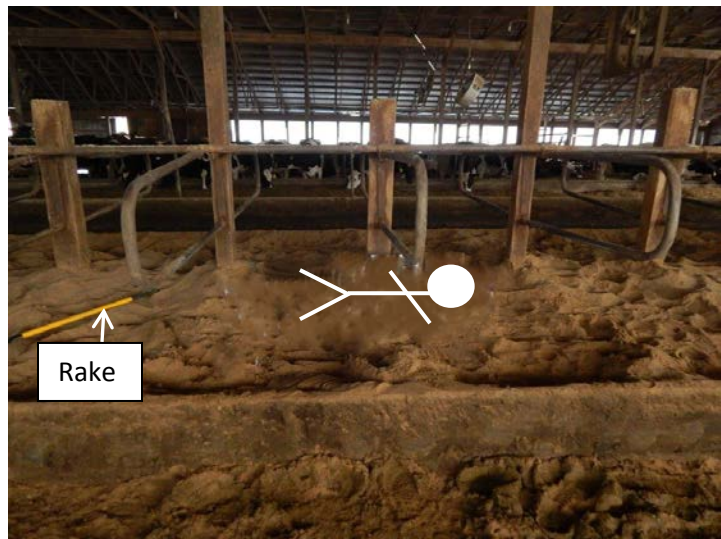


Figure 3. Position of decedent at incident freestall

The stalls had a raised sand bed with stanchions on either side. Cows lay in the stall with their head toward the front of the stall. Some cows lying down in the stall may not readily rise

to a standing position when it was time to be milked, causing the employee to urge them to stand up. MIFACE observed an employee, who had been trained at this farm, performing this activity. The employee entered the stall with a rake in one hand and stood near the cow’s head. After the cow stood up and exited the stall, the employee used the rake to remove any waste on the sand.

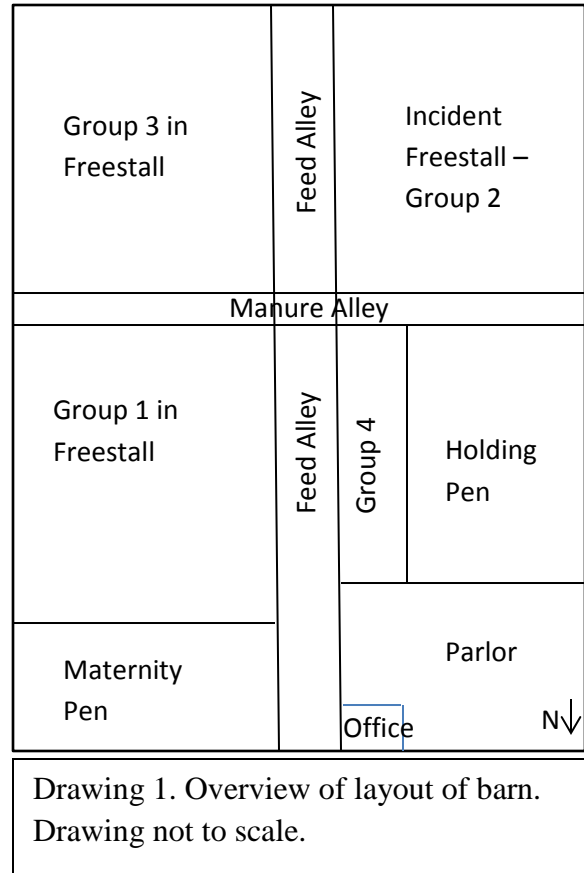
The worker had performed the herding activity (from a freestall to the milking parlor) earlier in the day.

At the time of the incident, the employee was moving 50-60 dairy cows from the freestall to the milking parlor’s holding pen. The bull was among them. This was the second group of cows to be moved and milked.

The incident was unwitnessed. Possible injury scenarios include: a) The worker was attacked by the bull (unpredictable bull behavior or the cow may have been in estrus and the bull was protective of the cow) or b) the decedent was struck and pinned against a stanchion by a cow which was getting up. When the worker fell to the ground, the cow may have panicked and mauled the worker. The actual location of the cow and bull were unknown.

Drawing 1 depicts the barn’s layout. The owners of the farm and a family member were in the north side of the barn; one of the owners was tending to a sick cow near the maternity pen and the other owner and family member were in the break area/office when they heard the cows bellowing. The three of them stepped out into the feed aisle and saw the bull in the feed aisle walking north, toward them. One of the owners yelled at the bull “get back there”. The owner tending the sick cow and the family member walked right up to the bull. The bull just turned around and started walking away. They were able to pen him in a different pen without incident.

While they were dealing with the bull, the other owner began to look for the decedent. The owner walked through the incident freestall housing Group 2, the cows ready to be milked. The owner found the decedent lying face down and unresponsive under a stanchion; the decedent’s upper body was in one stall and her lower body in another stall. The worker’s rake was nearby. The owner called out “call 911” and then rolled the decedent face up and began CPR. When emergency response arrived, they took over patient care. She was declared dead at the scene.



Later that day, when the Sheriff released the bull after the investigation, the owner had a trailer ready and the bull was loaded and shipped to a slaughterhouse.

### **CAUSE OF DEATH:**

The cause of death as listed on the death certificate was multiple blunt force injuries due to or as a consequence of an encounter with farm animal (bull). Toxicological tests were negative for alcohol and other screened substances.

### **RECOMMENDATIONS/DISCUSSION**

- Establish worker rules/procedures and acceptable work practices for anyone (employee & family) working around dairy animals specific to the farm operation. One work practice should be that workers prompt animal movement from the resting position in a partitioned freestall from an empty freestall next to the animal being directed.

Entry into the partitioned freestall from the rear of the animal should not occur. This entry choice puts the worker at higher risk and could alarm/frighten the cow. Just a worker stumbling, slipping or a sudden movement near a dairy animal can cause the kicking reflex. A worker in close proximity could be struck, trampled or mauled by the animal. Also, a reclining cow could slip when getting up from a resting position. If a worker is between the animal and a freestall partition, then a crushing injury, including a fatality, could result.

The Do's & Don'ts for each process of the movement and flow of animals into and out of the milking area need to be analyzed, detailed into procedures performed by a worker, and charted or documented for consistent training of current/future workers. A simple 3"x 5" card story board of procedures can be developed over a year of activity, accounting for seasonal and environmental changes. New or changed procedures can be worked into this "is the way we work with animals on this farm". Communication of safe work around animals and animal handling is key for worker competency and safer work.

Farms should document when training (i.e. reviewing rules/procedures/work practices) for all workers, but especially for newly hired workers with little farm and/or animal experience. Additionally, new workers could be assigned to an experienced mentor for a month or two.

- Train workers/family members to recognize animal health issues and attack scenarios and behaviors.

Animal health can complicate animal handling and movement with certain health conditions, including, but not limited, to "milk fever". Milk fever (or hypocalcemia) is the result of a reduction of blood calcium in the early stages of lactation. Per Penn State publication "[Troubleshooting Milk Fever and Other Downer Cow Problems](#)", the three stages of milk fever are described: "Milk fever is divided into three stages based on clinical signs. Stage I milk fever often goes unobserved because of its short duration (< 1 hour). Signs observed during this stage

include loss of appetite, excitability, nervousness, hypersensitivity, weakness, weight shifting, and shuffling of the hind feet”. The clinical signs of stage II milk fever can last from 1 to 12 hours. The affected animal may turn its head into its flank or may extend its head. The animal appears dull and listless; she has cold ears and a dry nose; she exhibits incoordination when walking; and muscles trembling and quivering are evident. Other signs observed during stage II are an inactive digestive tract and constipation. A decrease in body temperature is common, usually ranging from 96°F to 100°F. The heart rate will be rapid exceeding 100 beats per minute.”

In this incident, it is undetermined if any animal health issue was involved with this fatality. Freestall dairy housing complicates specific cow identity; difficulty can arise when assessing herd health, such as early stages of milk fever or early stages of estrus. A number of physical and behavioral signs may indicate that a cow or heifer is in or near estrus. Most workers and family would be familiar with some of the physical signs, such as mucus discharge. Other cow estrus behaviors may be more challenging to observe, such as standing for mounting by a bull, standing for mounting by another female, being mounted by another female but moving away rather than standing, attempting to mount another female, restlessness, persistent licking or sniffing other animals, chin pressing on rump or back of another animal, etc. Training workers and family members to recognize common health problems, such as milk fever, and stages of estrus in dairy cows would not only assist in maintaining herd health, but also worker safety.

Temple Grandin, a noted animal behavior expert, offers several observations regarding dairy bulls, how humans should interact with them, and their management on dairy farms. Dairy bulls have been identified as more aggressive and likely to attack compared to beef bulls. Dairy bulls that are individually bucket fed are often more dangerous than beef bulls raised with the cow or in a herd. There is no such thing as a totally safe bull, but the risk of an attack can be reduced with proper management. When dairy calves are six to eight weeks old, they should be put in group pens. If there are no bull calves available for pen mates, a young bull should be raised with steer calves that are older and heavier. To further reduce the danger, dairies that use bulls should consider raising bull calves on a nurse cow. Raising bull calves on a nurse cow will imprint them more strongly to their own kind and further reduce the tendency to attack.

Workers and family members should be instructed to never play butting games with calves and never allow a bull calf to push his head up against them. The bull should be told to get back. An individual should stroke the bull under the chin, on its rear or on the withers (shoulder) – not on the head/forehead. Applying pressure on this area will encourage butting. A young bull can bond so well with its human handlers that he “forgets he is a bull” causing him to challenge or dominate his herd mates (handlers) when he matures.

It is important that workers and family members receive training on cow and bull behavior patterns, and the behavioral precursors to aggression and/or attack.



Cattle have wide range panoramic field of vision and can see, and be stimulated by, movement or activities to the side and rear of them. Sudden jerky movements, quick movements, and sudden intermittent or high pitch noises can startle them. Cows, steers, and calves commonly respond to handlers or stimulus based on the type of stimulus to the animal's "flight zone" (i.e., personal space). Staying outside an animal's flight zone causes cattle to stop and turn toward the handler or perceived predator. Animals that are fearful or approached head-on have larger flight-zones. Invading the flight zone causes animals to turn and move away from the handler (or predator). This is a natural predator-avoidance, or fear-based response, and understanding of the flight zone can be used to effectively herd animals when the handler moves ahead or behind the animals "point of balance" – an imaginary line drawn perpendicular to the body, at the shoulders. Being separated from herd mates causes cattle to become agitated.

Male aggressiveness is unrelated to fear-based response described above. Aggressive behavior of mature bulls is based on asserting dominance over a perceived rival (another bull or a human) in the bull's cow herd. A dominant bull will try to chase away smaller or subordinate rivals from cows the bull wants to breed; bulls raised around humans perceive humans as their subordinate rivals. A bull is more likely to attack a handler if the handler has the scent of another subordinate male on them. From the bull's perspective, humans that bend low or kneel may be perceived as assuming a threatening pose. Humans that physically position themselves (knowingly or unknowingly) between the bull and a receptive cow (in estrus) are viewed as a rival and are at risk for attack.

Dairy farmers should be aware of signs indicating risk of attack:

- Bulls often do not look at a person prior to charging.
- Bulls perform a 'broadside threat' before attacking – by turning sideways to expose it's full size to the rival, it may lower its head and turn it toward the rival, and flex its neck muscles to show its strength. Showing broadside threat is a warning of a bull attack.
- When a bull faces its "threat" head on, it will normally lower its head and may paw or stomp the ground, or jab its horns at the ground before charge. Bulls may or may not make snorting or vocalizing noises prior to attacking.

When a bull shows threatening behavior, the safest response by anyone in danger is to move your head as if to look away from direct eye contact (but still keep watch on the bull) and slowly back away. One should never turn their back on a bull. In this incident, it is unknown if the decedent was audibly warned, and was not aware of, or observing, the bull's behavior to know she was at risk.

Several scenarios may have occurred. The worker may have been positioned between the bull and a cow in estrus, without realizing it, and thus unknowingly provoked the bull's response. The worker may have tried to interrupt a breeding activity to herd the cow to the parlor. Another scenario is that the bull may have been showing dominance behavior or may have just been

trying to be “playful”. And something as small or innocuous as a bird flying in the barn may have startled the cow or bull, causing it to panic.

- Ensure the freestall design permits cows to easily stand up when lying down in the stall to avoid animal handling & comfort issues and provides worker escape routes.

Dairy operators should check the cow spacing/area for each freestall to avoid animal handling & comfort issues. It is unknown if, while in the individual freestall, the cow had difficulty rising from a recumbent condition due to the design of the freestall. Several sources of information can be utilized in designing a new or retrofit freestall area:

- [\*Dairy Freestall Housing and Equipment\*](#). MidWest Plan Service, MWPS-7 Seventh Edition, 2000.
- [\*Remodeling Your Dairy – Cost Effective Facilities\*](#). Iowa State University Cooperative Extension.
- [\*Cow Comfort Issues in Freestall Barns\*](#). Roger Palmer and Brian Holmes, University of Wisconsin-Madison.

A flow chart for evaluating freestalls can be found in [\*Code of Practice For the Care and Handling of Dairy Cattle\*](#), National Farm Animal Care Council, Canada.

When planning dairy facilities, producers should also include a secure holding area where the bull can be routed and held during milking and accessible escape routes or protected areas, such as passage gates for working in close quarters with livestock.

- Workers should not be permitted to be in a pen with a bull alone and should maintain constant awareness of the location and behavior of bulls when entering a holding pen.

On this farm, it was a usual work practice to be in the pen with the bull while working alone. As there had been no previous incidents since the current ownership of the farm, there was an expectation that there would not be an aggressive attack by the bull. Although it was unknown whether the bull was involved in the attack, due to the unpredictable nature of a bull, and the job responsibilities of the decedent in the holding area, her attention was, most likely, on the task at hand, not on the bull and its behavior. If a worker is in a pen with a bull, it is recommended that another individual trained in animal behavior and attack scenarios be present to watch the bull and to alert the individual working if attack behaviors are exhibited so both individuals can retreat safely.

- Consider using artificial insemination, not a natural service bull, to impregnate cows.

The farm owners used a natural service bull because they were familiar with the “natural” process and were concerned about the problems associated with artificial insemination. Artificial insemination relies upon effective estrous synchronization programs. In recent years, new technologies result in improvements to traditional reproductive management (e.g., heat detection



and artificial insemination) and approaches synchronizing timed artificial insemination programs achieving improved reproductive success. A focused effort on reproductive management has been shown to increase pregnancy rates, translating to greater reproductive efficiency on the dairy. Removing a safety hazard, such as a breeding bull, increases worker safety while working with farm animals. If a bull is used, it should be culled if it begins to show aggressive behaviors and replaced with a younger bull that doesn't have this problem.

**KEY WORDS:** Bull, Dairy operation, Freestall design, Animal aggressive behaviors, Animal attack scenarios, Agriculture

## REFERENCES

- *Troubleshooting Milk Fever and Other Downer Cow Problems*. Penn State University Extension.  
<http://extension.psu.edu/animals/dairy/nutrition/nutrition-and-feeding/nutrition-and-health/trouble-shooting-milk-fever-and-downer-cow-problems>
- *Dairy Freestall Housing and Equipment*. MidWest Plan Service, MWPS-7 Seventh Edition, 2000.  
[http://www.public.iastate.edu/~mwps\\_dis/mwps\\_web/87zgGwEKj.QDg.pdf](http://www.public.iastate.edu/~mwps_dis/mwps_web/87zgGwEKj.QDg.pdf)
- *Remodeling Your Dairy – Cost Effective Facilities*. Iowa State University Cooperative Extension.  
<https://www.extension.iastate.edu/sites/www.extension.iastate.edu/files/dubuque/RemodelingDairyFacilities.pdf>
- *Code of Practice For the Care and Handling of Dairy Cattle*. National Farm Animal Care Council, Canada. [http://www.nfacc.ca/pdfs/codes/dairy\\_code\\_of\\_practice.pdf](http://www.nfacc.ca/pdfs/codes/dairy_code_of_practice.pdf)
- *Cow Comfort Issues in Freestall Barns*. Roger Palmer and Brian Holmes, University of Wisconsin-Madison. <http://manitowoc.uwex.edu/files/2011/10/Cow-Comfort-Issues-2005-Dairy-Road-Show-12-9-04d1.pdf>

## RESOURCES

- Grandin, Temple. *Understanding Flight Zone and Point of Balance for Low Stress Handling of Cattle, Sheep, and Pigs* (Revised June 2015). Dept. of Animal Science, Colorado State University.  
<http://www.grandin.com/behaviour/principles/flight.zone.html>
- *Farmer dies from injuries after being attacked by bull*. Iowa FACE Case No. 2011 IA 043 Report Date: 22 October 2012. <http://www.cdc.gov/niosh/FACE/pdfs/11IA043.pdf>
- Stafford, Kevin. *Cattle Handling Skills*. ThinkSafe.  
[http://www.acc.co.nz/PRD\\_EXT\\_CSMP/groups/external\\_ip/documents/publications\\_promotion/wim2\\_065192.pdf](http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_ip/documents/publications_promotion/wim2_065192.pdf)
- Dairy Cattle Reproduction Council, 1800 S. Oak, Suite 100 | Champaign, IL 61820.  
<http://www.drcouncil.org/newsletters/reproductive-management.aspx>.

- *Two Farmers/Brothers Killed By Young Bull*. Iowa FACE Case No. 00IA055. <http://www.cdc.gov/niosh/face/stateface/ia/00ia055.html>

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