WORKER INJURIES INVOLVING THE INTERACTION OF CATTLE, CATTLE HANDLERS, AND FARM STRUCTURES OR EQUIPMENT

by

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Abstract

Cattle and other livestock have been identified as leading sources of injuries to workers in agriculture. Cattle handling injuries can be serious and often appear to be under-reported[3,4]. Many of these injuries involve predictable patterns of interactions among victims, animals, and fixed farmstead structures or gates. There has been some progress toward developing safer facility designs and work procedures, but continuing reports of injuries suggest further efforts are still needed.

The present study focused on worker injuries that involved the interaction of three elements: (a) cattle, (b) cattle handlers, and (c) farm structures or equipment—including swinging gates and stationary barriers. The goal of the study was to identify opportunities for injury prevention. The source of injury cases was the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS)[29,45]. We believe this is the first report of cattle related injuries based on NEISS data. We selected the NEISS database for this investigation because it includes product codes for many farmstead barriers such as fences, walls, and doors. The database was also selected because it contains brief narratives that help to describe the circumstances of each incident.

Predictable interactions between humans, animals, and farm structures led to many of the cattle handling injuries reported in the NEISS database. In almost 30% of cases, cattle pushed workers into structures such as fences, gates, posts, and walls. In another 16-19% of injuries, cattle struck gates and other objects, propelling them at the victims. These percentages are similar to findings reported in previous studies that drew on data from New York hospitals[10], news reports in the central United States [5], and workers compensation cases in Colorado[3,4]. In all, gates and other physical barriers contributed to about 45% of cattle handling injuries in the present study.

Keywords: cattle handling; cattle safety; cattle; cow; bull; injuries; animals; agricultural injuries; farm safety; narrative text; safety; occupational health; injury risk; accidents; livestock; youth farm injuries; older farmers.

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I would also like to thank my friends and family. You have given me the love and support needed to achieve my goals and the encouragement for the future endeavors to come.

Chapter 1 - Literature Review

Cattle and other livestock have been identified as leading sources of injuries to workers in agriculture. For instance, Douphrate *et al* [3,4] found that livestock handling activities accounted for about one-fourth of all workers' compensation claims in Colorado dairies and facilities where beef cattle were produced and sold. Not only were livestock-handling injuries common in these settings, they also tended to be severe, typically involving more serious diagnoses and greater costs per claim, compared with other types of injuries.

Other researchers have found livestock handling to be similarly hazardous in a variety of other settings. For instance, Hendricks and Adekoya[13] found that animal handling accounted for one-fifth of all injuries to youth on farms throughout the United States. Young adults, middle-aged workers, and the elderly are also affected; in fact, livestock-related injuries have been widely reported among workers aged well into their 80s[5, 12, 17, 18]. Furthermore, although white males seem to account for the largest number of injuries, numerous injuries have also been reported among females and minorities[4,6,7, 9,10,12,18,26,31,32].

Among the livestock species, cattle have accounted for a large proportion of all documented animal-handling injuries[3,4,6,8,13,18]. In fact, Drudi's[7] analysis of data from the Bureau of Labor Statistics indicated that cattle were responsible "for more fatal work injuries than any other animal" in the United States (p. 18).

The circumstances of cattle related injuries are beginning to yield to the scrutiny of researchers, and some findings may have important implications for prevention. For instance, Douphrate *et al*[3,4] found that cattle handling injuries in Colorado often occurred when dairy workers were either kicked or stepped on while milking. Similarly, Casey *et al*[10] found that dairy workers in the state of New York were frequently injured while washing udders or attaching milking equipment. These findings raise the possibility that a substantial number of injuries might be prevented through the redesign of milking equipment and procedures. In fact, Douphrate *et al*[3,4] recommended that "injury prevention efforts should be directed at livestock-handling facility and equipment design" (p. 404-405), and Casey *et al*[9,10] stated that improved facilities and work practices could prevent many injuries.

In beef and dairy settings overall, injuries have been especially common where workers and cattle are crowded together in barns, alleys, and pens[3,4,5,9,10]. This association has led to calls for improved physical barriers and improved work procedures designed to keep cattle calm and separated from their handlers[1, 30].

Although physical barriers appear to be important, it is not always clear how those barriers should be designed. In fact, as discussed below, recent research has suggested that some farmstead barriers may actually *contribute* to serious injuries among cattle handlers[3,4,510,17,33,35,36,37,38,40,42]. For instance, many workers have been crushed by cattle against rigid, stationary structures such as chutes and walls. In other cases, workers have been struck by steel gates or doors that were swung open with great force after being hit by cattle.

These findings suggest it is worth considering whether movable barriers such as gates and doors might be redesigned to prevent cattle from propelling them at high speeds toward workers. Furthermore, walls and chutes might use less rigid designs that permit more workers to survive the push of frantic cattle.

Researchers have adopted a variety of approaches to reporting the circumstances of injuries resulting from the interactions of cattle, humans, and structures. For instance, some researchers have indicated the importance of "crushed between" injuries without specifying the exact objects involved. As an example, Austin[33] examined 144 animal related fatalities documented by the U.S. Bureau of Labor Statistics and noted simply that some workers were killed when cattle pinned them to a "solid object" (p. 10). Likewise, based on interviews with injury victims in Iowa, Rautiainen *et al*[38] reported that injuries often occurred when animals pushed farmers against a "structure" (p. 55).

In contrast, other researchers have identified the particular structures against which workers have been pinned. In their study of cow related injuries in New York, for instance, Casey *et al*[10] reported that about one-fourth of injuries occurred when a cow pushed the victim against a fixed object such as a pipe, stanchion, post, wall, or fence. Similarly, the Centers for Disease Control[5] recently reported on 21 fatalities caused by cattle in the central United States. In about one-fourth of the cases, it was reported that the animal pinned or crushed the worker against a fence, barn wall, or barn door.

Some investigations have suggested that workers are especially likely to be crushed against barn walls and stall structures. For instance, while reporting on cattle handling injuries in Israel, Mainzer[37] noted that cattle sometimes crushed workers against walls, and injuries were less common in facilities designed to keep workers separated from cattle. Similarly, Waller[42] reported that about one-sixth of cattle related injuries treated at two Vermont hospitals occurred when the victim's hand or other body part was caught between a cow and its stall.

Research suggests there may also be a tendency for cattle to crush workers against restraining chutes. In an investigation of more than 4,000 farm injuries in 21 states, Hoskin and Miller[36] noted a tendency for victims' fingers and hands to become caught between squeeze chutes and the bodies of livestock. Similarly, Lindsay *et al*[17] found that Scottish farmers were often injured when their arms were crushed between a cow and the restraining chute while clipping hair before slaughter.

Fencing and gates have also played important roles in injuries to livestock handlers, as noted in Day's[35] analysis of injuries reported on Australian dairy farms. At least one of the 21 cattle related fatalities reported by the Centers for Disease Control[5] involved a victim who died after being struck by a gate that was propelled by charging cattle. Based on an analysis of news stories and other case reports, Sheldon *et al*[40] noted that bull related incidents tended to happen when workers were in pens with bulls, and that injuries were often related to inappropriate fencing and gates. Finally, in what may be the most detailed study to date, Douphrate, *et al*[3,4] noted that 17% of cattle related Colorado workers compensation claims involved corral gates, and over half of those occurred when a cow kicked the gate into a worker.

As illustrated by these reports, many livestock workers have been injured in cases involving interactions with cattle and stationary farmstead structures or swinging gates. Further study of these interactions is necessary in order to develop life-saving interventions.

Scope of the Present Study

The present study focused on worker injuries that involved the interaction of three elements: (a) cattle, (b) cattle handlers, and (c) farm structures or equipment—including swinging gates and stationary barriers. The goal of the study was to identify opportunities for injury prevention. The source of injury cases was the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS)[29,45]. We believe this is the first report

of cattle related injuries based on NEISS[29,45] data. We selected the NEISS database for this investigation because it includes product codes for many farmstead barriers such as fences, walls, and doors. The database was also selected because it contains brief narratives that help to describe the circumstances of each incident.

Chapter 2 - Worker Injuries Involving the Interaction of Cattle, Cattle Handlers, and Farm Structures or Equipment

Abstract

Objectives: Cattle and other livestock have been identified as leading sources of injuries to workers in agriculture. The present study focused on worker injuries that involved the interaction of three elements: (a) cattle, (b) cattle handlers, and (c) farm structures or equipment—including swinging gates and stationary barriers. The goal of the study was to identify opportunities for injury prevention.

Methods: We examined 221 reports of injuries to cattle handlers from the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS).

Results: Predictable interactions between humans, animals, and farm structures led to many of the cattle handling injuries reported in the NEISS database. In almost 30% of cases, cattle pushed workers into structures such as fences, gates, posts, and walls. In another 16-19% of injuries, cattle struck gates and other objects, propelling them at the victims. In all, gates and other physical barriers contributed to about 45% of cattle handling injuries. These percentages are similar to findings reported in previous research using data from hospitals, news reports, and workers compensation claims.

Conclusion: Cattle handling injuries can be serious and often appear to be under-reported. Many of these injuries involve predictable patterns of interactions among victims, animals, and fixed farmstead structures or gates. There has been some progress toward developing safer facility designs and work procedures, but continuing reports of injuries suggest further efforts are needed.

Keywords: cattle, safety, injuries

Introduction

Cattle and other livestock have been identified as leading sources of injuries to workers in agriculture. For instance, Douphrate *et al* [3,4] found that livestock handling activities accounted for about one-fourth of all workers' compensation claims in Colorado dairies and facilities where

beef cattle were produced and sold. Not only were livestock-handling injuries common in these settings—they also tended to be severe, typically involving more serious diagnoses and greater costs per claim, compared with other types of injuries.

Other researchers have found livestock handling to be similarly hazardous in a variety of settings. For instance, Hendricks and Adekoya[13] found that animal handling accounted for one-fifth of all injuries to youth on farms throughout the United States. Young adults, middle-aged workers, and the elderly are also affected; in fact, livestock-related injuries have been widely reported among workers aged well into their 80s[5, 12, 17, 18]. Furthermore, although white males seem to account for the largest number of injuries, numerous injuries have also been reported among females and minorities[4,6,7, 9,10,12,18,26,31,32].

As a species, cattle have accounted for a large proportion of all documented animal-handling injuries[3,4,6,8,13,18]. In fact, Drudi's[7] analysis of data from the Bureau of Labor Statistics indicated that cattle were responsible "for more fatal work injuries than any other animal" in the United States (p. 18).

The circumstances of cattle related injuries are being more closely evaluated by researchers, and some findings may have important implications for prevention. For instance, Douphrate *et al*[3,4] found that cattle handling injuries in Colorado often occurred when dairy workers were either kicked or stepped on while milking. Similarly, Casey *et al*[10] found that dairy workers in the state of New York were frequently injured while washing udders or attaching milking equipment. These findings raise the possibility that a substantial number of injuries might be prevented through the redesign of milking equipment and procedures. In fact, Douphrate *et al*[3,4] recommended that "injury prevention efforts should be directed at livestock-handling facility and equipment design" (p. 404-405), and Casey *et al*[9,10] stated that improved facilities and work practices could prevent many injuries.

In beef and dairy settings overall, injuries have been especially common where workers and cattle are crowded together in barns, alleys, and pens[3,4,5,9,10]. This realization has led to calls for improved physical barriers and new work procedures designed to keep cattle calm and separated from their handlers[1, 30].

Although physical barriers appear to be important, it is not always clear how those barriers should be designed. In fact, recent research has suggested that some farmstead barriers may actually *contribute* to serious injuries among cattle handlers. For instance, many workers

have been crushed by cattle against rigid, stationary structures such as fences, posts, barn walls, stalls, chutes, stanchions, and barn doors[5, 10, 17, 33, 36, 37, 38, 42]. In other cases, workers have been struck by steel gates or doors that were swung open with great force after being hit by cattle[3, 4, 5, 35,40].

These findings suggest it is worth considering whether movable barriers such as gates and doors might be redesigned to prevent cattle from propelling them at high speeds toward workers. Furthermore, walls and chutes might use less rigid designs that permit more workers to survive the push of frantic cattle. Further study of injuries involving the interaction of cattle, workers, and farmstead structures is needed in order to develop life-saving interventions.

The present study focused on worker injuries that involved the interaction of three elements: (a) cattle, (b) cattle handlers, and (c) farm structures or equipment—including swinging gates and stationary barriers. The goal of the study was to identify opportunities for injury prevention. The source of injury cases was the Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS)[29]. We believe this is the first report of cattle related injuries based on NEISS[45] data. We selected the NEISS database for this investigation because it includes product codes for many farmstead barriers such as fences, walls, and doors. The database was also selected because it contains brief narratives that help to illuminate the circumstances of each incident.

Materials and Methods

The Consumer Product Safety Commission's (CPSC) National Electronic Injury Surveillance System (NEISS) maintains data on patients from a sample of 100 hospitals throughout the United States. The hospitals represent a probability sample of all United States emergency rooms. Each hospital collects patient information from emergency room visits that involve consumer products. For every visit, data collected includes a short narrative describing the injury and coded data such as date, gender, age, diagnosis, and body part injured.

For the years, 2002-2009, we searched all cases in the NEISS database for the following keywords: calf, calves, bull, steer, heifer, cow, and cattle. This search resulted in 7,686 injury reports. Next, the 7,686 reports were independently reviewed by two investigators to eliminate reports that were clearly not related to cattle handling (e.g., a child was struck in the *calf* by a toy; a victim was struck in the leg by a *bull*et; a man in a car crash struck his chest against the

*steer*ing wheel; a woman was kicked by someone wearing *cow*boy boots). We also excluded sporting injuries such as bull riding and vehicular accidents in which victims were clearly not handling cattle (e.g., a car rounded a curve in the highway and struck a cow that was standing in the road). After review, there were 221 reports involving injuries associated with cattle handling (98.64% initial agreement between investigators; all discrepancies were easily resolved through discussion).

Based on events described in the narratives of the NEISS injury reports, 10 mutually exclusive injury scenarios were developed to characterize the 221 cattle handling injuries (table 2.1). Two investigators independently assigned each of the 221 reports to the 10 injury scenarios (99.10% initial agreement; all discrepancies were easily resolved). Each of the 221 reports was also designated as "definitely" or "probably" belonging to the assigned injury scenario (95.48% initial agreement; all discrepancies were easily resolved). Table 2.1 provides representative examples of narratives for the 10 injury scenarios.

In addition to descriptive statistics, we employed chi-square tests and odds ratios to identify injury patterns and relative risks. For odds ratios related to the gender of victims, denominators consisted of the number of men and women employed in "Animal Production" as reported by the Bureau of Labor Statistics[31,46]. For odds ratios related to the gender of cattle involved in incidents, denominators consisted of the number of male and female cattle in United States agriculture as reported by the National Agricultural Statistics Service[23].

For chi-square tests involving injury diagnoses, expected frequencies were calculated by applying the proportion of each diagnosis from non-cattle related NEISS cases to the 221 cases involving cattle. For instance, among the 2,920,574 non-cattle related cases during the years of study, 17.27% of diagnoses consisted of strains and sprains. The 38 expected cattle related strains and sprains represent 17.27% of the 221 total cattle handling injuries. Expected frequencies for chi-square tests involving injured body parts were calculated in the same manner.

Results

Cattle handling injuries accounted for .0076% of the 2,920,795 cases in the NEISS database during 2002-2009. Females comprised 26% of the labor force in animal production during the years studied[22], yet females accounted for only 20% of the cattle handling injuries in the NEISS database. In contrast, males accounted for just 74% of those employed in animal

production, but accounted for 80% of cattle handling injuries in the NEISS database. Adjusted for numbers employed in the animal production labor force, males were almost four times as likely to suffer cattle handling injuries compared with females (OR 3.91, 95% CI 2.82 to 5.43).

Over one-fourth of all cattle handling injuries (table 2.1) occurred when cattle struck a victim, causing the victim to then strike a farmstead structure (e.g. fence, gate, post, wall). Investigators reported that all 63 of these incidents "definitely" fit the scenario, indicating the facts were clear in the NEISS narratives.

In one-fifth of cattle handling injuries, contact with an animal was not explicitly mentioned in the NEISS reports (table 2.1). The narratives in these incidents were not always clear; consequently, investigators determined only 17 of the 45 cases definitely fit the scenario, due mainly to uncertainty about whether victims were handling cattle at the time of injury.

Slightly less than one-fifth of cattle handling injuries occurred when cattle struck farmstead structures (primarily gates), and the farmstead structures then struck the human victims. Reports of these cases were relatively straight forward: 35 definitely fit the scenario, and 6 were probable.

Other scenarios accounted for fewer incidents. For instance, about 8% of cattle handling injuries occurred when victims became entangled in rope (17 definite, 1 probable). About 7% of incidents occurred when cattle struck victims and no impact with farmstead structures occurred (10 definite, 5 probable—indicating uncertainty about whether all incidents occurred while handling cattle). About 6% of cases involved horses or ATVs, but contact by cattle was not explicitly mentioned (11 definite and 3 probable). Incidents involving horses or ATVs that *did* mention contact with cattle, accounted for about 4% of cattle handling injuries (8 definite, 0 probable). About 4% of incidents occurred when victims were trying to escape from cattle (9 definite, 0 probable). Other incidents involved cuts and punctures suffered while butchering cattle (2.71%, 6 definite, 0 probable), and while performing animal care (0.90%, 2 definite, 0 probable).

The ages of victims in cattle handling incidents ranged from 2-88 years (M = 41, SD = 22). Children between the age of 1 and 17 accounted for 18% of the injuries (figure 2.1).

Of the 221 cattle related injuries, 125 involved cow/heifers (56%) and 39 involved bulls and steers (18%). Gender of the animal was not reported in 57 cases (26%). During the years of study, there were approximately 334 million cows and heifers and approximately 18 million

bulls (500+ pounds) in United States agriculture[23,44,47]. When adjusted for the number of male and female cattle present in the United States, bulls and steers were six times as likely to be involved in a human injury compared with cows and heifers (OR 6.16, 95% CI 4.29 to 8.84).

NEISS codes for injury disposition indicate the extent of treatment offered by healthcare providers and accepted by patients. Among the 221 cattle handling incidents, 1 victim left without treatment and 195 victims were treated and released. The remaining 25 victims were treated and received further medical attention (16 were admitted to the presenting hospital, 8 were treated and transferred to another hospital, and 1 was held for observation). When adjusted for the number of male and female cattle in United States agriculture, bulls and steers were eight and a half times as likely to inflict injuries resulting in further medical attention (observation, transfer, hospitalization) compared with cows and heifers (OR 8.67, 95% CI 3.29 to 22.81).

No clear trends were observed in the distribution of injuries throughout the months of the year.

The NEISS coding manual includes 26 mutually exclusive categories that indicate which part of the body was most seriously injured in each incident. Of those 26 body parts, just 7 accounted for the main site of injury in 68% of all cattle related cases: the fingers, face, head, upper trunk, hand, lower trunk and shoulder (figure 2.2). In contrast, these seven body parts accounted for just 55% of all non-cattle related cases in the NEISS database for the years of study. The distribution of injuries among these seven body parts was not significantly different between cattle related and non-cattle incidents in the NEISS database ($\chi^2(6)=9.84$, $p = 0.135$).

The NEISS coding manual includes 30 mutually exclusive diagnoses; however, just 4 of those diagnoses accounted for 75% of all cattle related injuries: lacerations, contusions/abrasions, fractures, and strains/sprains (figure 2.3). The overall distribution of injuries among these four diagnoses differed between the cattle related injuries and the non-cattle related incidents in the NEISS database ($\chi^2(3)=11.52$, $p =.009$).

The consumer product involved in 56% of all cattle related injuries was fences or fence posts (including gates). When adjusted for the number of male and female cattle in United States agriculture[44], bulls and steers were seven times as likely to be involved in fence or fence post injuries to a human, compared with cows and heifers (OR 7.29, 95% CI 4.63 to 11.47).

Discussion

Predictable interactions between humans, animals, and farm structures led to many of the cattle handling injuries reported in the NEISS database. In almost 30% of cases, cattle pushed workers into structures such as fences, gates, posts, and walls. In another 16-19% of injuries, cattle struck gates and other objects, propelling them at the victims. These percentages are similar to findings reported in previous studies that drew on data from New York hospitals[10], news reports in the central United States [5], and workers compensation cases in Colorado[3,4]. In all, gates and other physical barriers contributed to about 45% of cattle handling injuries in the present study.

The NEISS data also confirmed that injuries are common while working with cattle in enclosed areas, moving or herding cattle, loading, and feeding[5,10,36,37,40]. Taken together, the findings of the present study support the calls of previous researchers for increased efforts toward the design *and* adoption of safer farm structures, equipment, and work practices.

To date, considerable progress has been made in the design of facilities that keep cattle calm and separated from humans[1,34,41]. Nevertheless, the cost of these facilities may prevent their adoption on family farms and in other low-volume cattle handling operations. Furthermore, it seems likely that some direct contact between cattle and caretakers will always be required. It may be necessary, therefore, to explore additional options such as structures that absorb some of the impact when workers are forced against structures by an animal. In fact, this approach was proposed more than two decades ago by Waller[42].

In recent years, there has also been some progress toward the development of safer gate designs. For instance, Bentley[34] and Stafford[41] have recommended the use of revolving one-way gates that pivot 360° on a center post. These gates incorporate ratchet mechanisms to prevent cattle from pushing them back toward workers. With respect to traditional gates that are hinged on one end, Bentley[34] and Stafford[41] have recommended features that eliminate the need for workers to approach when cattle are nearby. Examples of these features include remote-opening (e.g., cord-operated) latches, self-closing latches, and gates that swing shut on their own. Sliding gates and other non-swinging designs represent yet another alternative discussed by Bentley[34] and Stafford[41], who also emphasized the importance of keeping gates properly maintained so they always operate as intended with humans safely outside the danger zone.

Despite progress, continuing reports of injuries make it clear that further efforts are needed to develop safer cattle handling structures and practices. To encourage adoption by facility owners, new structures and practices must be inexpensive and they must improve workplace productivity. Concerted promotional efforts will also be needed to encourage adoption, with the full input and participation of important stakeholders such as grass-roots farm organizations, trade associations, government agencies, and private insurers.

With respect to other findings, our research corroborated the results of investigators who have found that even though bulls are responsible for fewer injuries than cows in the United State, bull injuries tend to be more severe[9,10]. We noted injuries across all age ranges and both genders, similar to the findings of previous studies[3,4,8,19]. Our research also confirmed that animal-related injuries often include bruises, contusions, strains, sprains, fractures, and abrasions, while affected body parts typically include the face, chest, lower arm, wrist, hand, fingers, ankle, foot and toes[3,4,6].

As a potential limiting factor, it is important to note that our data were confined to injuries captured by the NEISS reporting system of the U.S. Consumer Product Safety Commission. The similarity of our findings to those of other researchers, however, suggests the results were representative of cattle handling injuries identified using other data collection systems.

Conclusion

Cattle handling injuries can be serious and often appear to be under-reported[3,4]. Many of these injuries involve predictable patterns of interactions among victims, animals, and fixed farmstead structures or gates. There has been some progress toward developing safer facility designs and work procedures, but continuing reports of injuries suggest further efforts are still needed.

Figures and Tables

Figure 2.1 Numbers of injuries to children aged 16 years and younger as reported in the National Electronic Injury Surveillance System database covering calendar years 2002 to 2009.

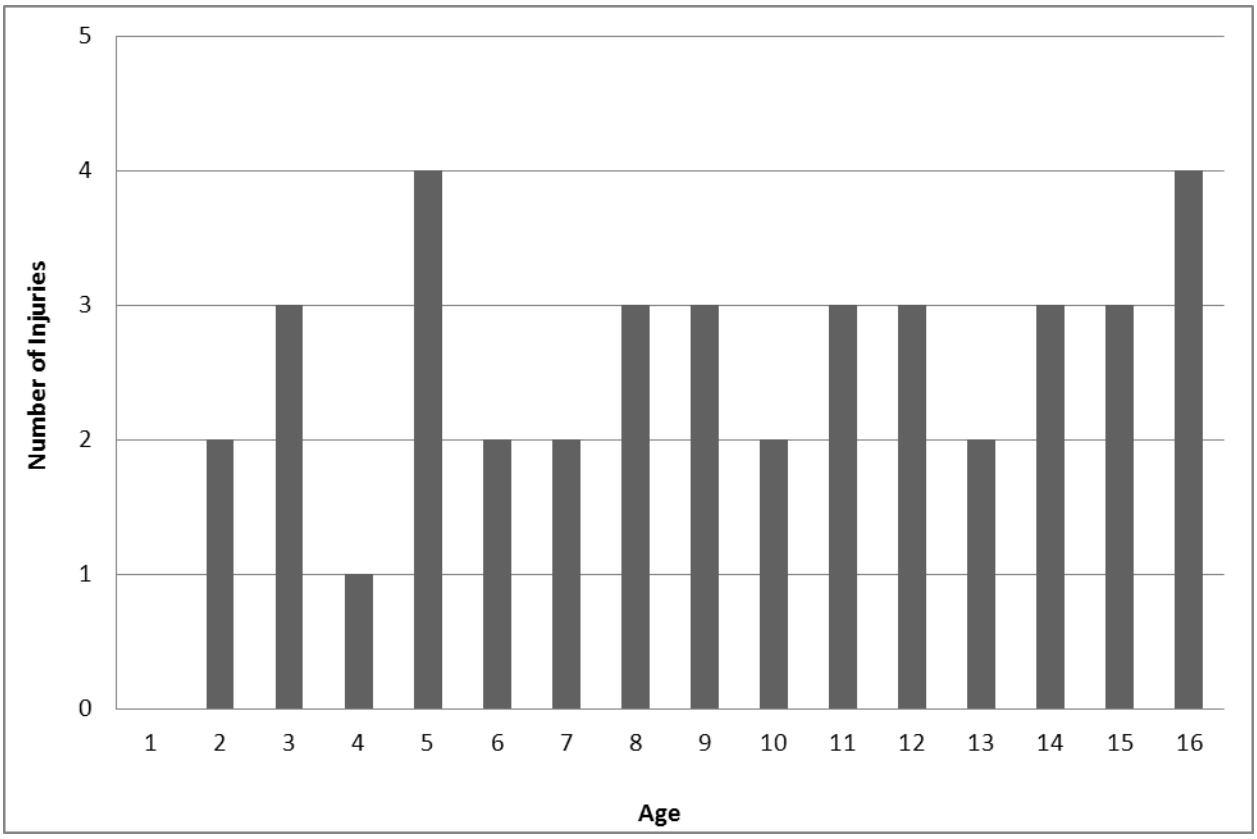

Figure 2.2 Percentages of injuries to specific body parts that were or were not associated with cattle handling, as reported in the National Electronic Injury Surveillance System (NEISS) database covering calendar years 2002 to 2009. The distribution of injuries among these seven body parts was not significantly different between cattle related and non-cattle incidents in the NEISS database ($\chi^2(6)=9.84$, $p = 0.135$).

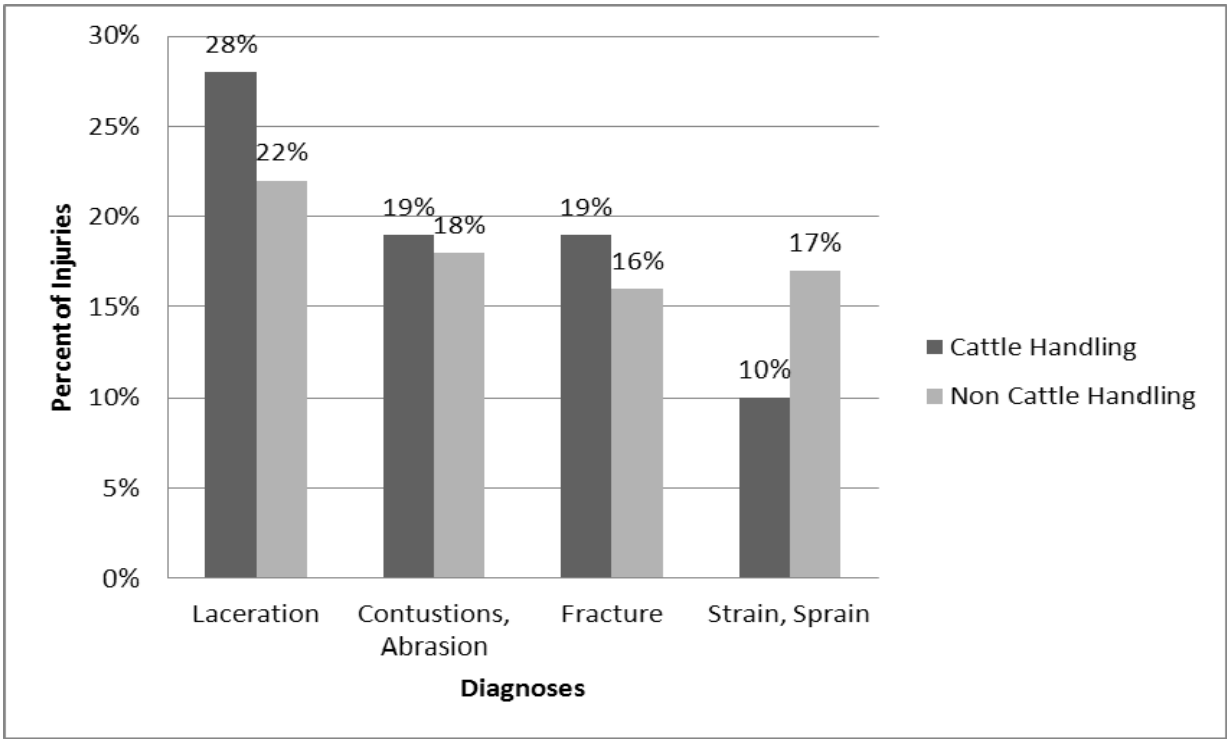

Figure 2.3 Percentages of injury diagnoses that were or were not associated with cattle handling, as reported in the National Electronic Injury Surveillance System (NEISS) database covering calendar years 2002 to 2009. The overall distribution of injuries among these four diagnoses differed between the cattle related injuries and the non-cattle related incidents in the NEISS database ($x^2(3)=11.52$, p =.009).

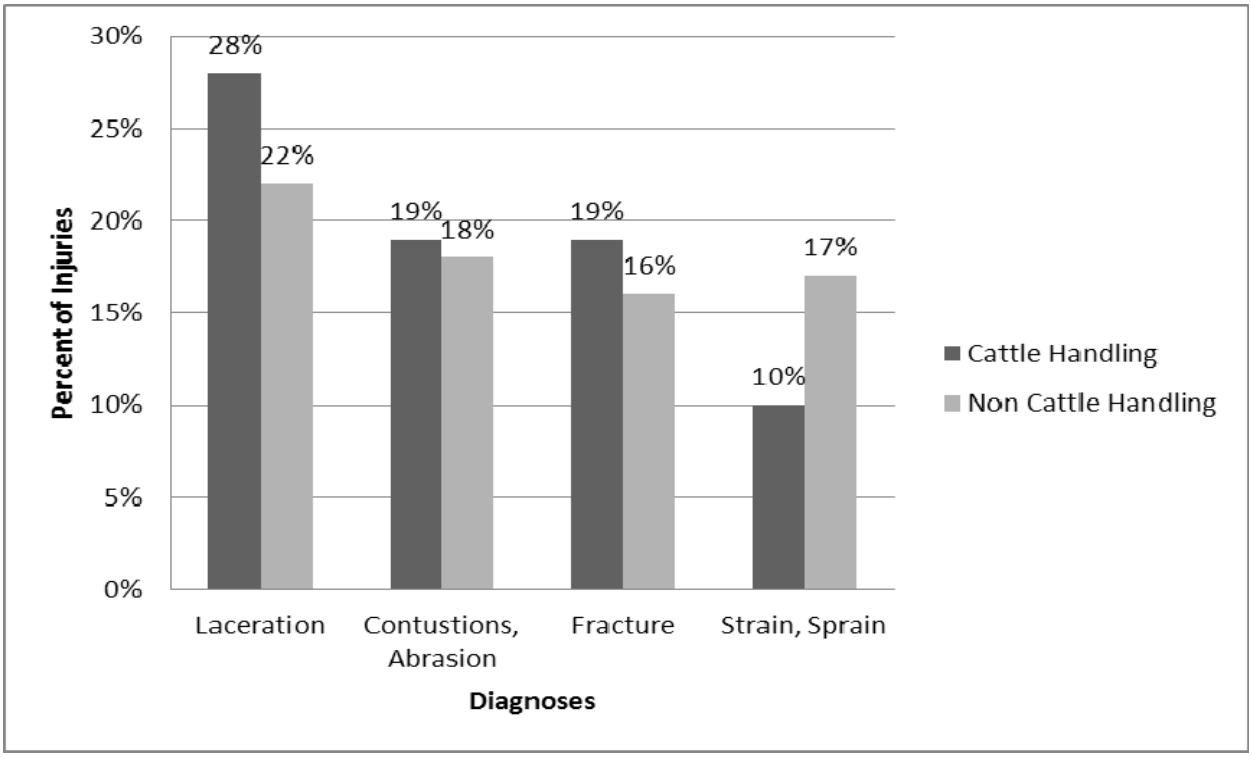

Table 2.1 Injury scenarios used to categorize animal* injury circumstances based upon injury narratives as reported in the National Electronic Injury Surveillance System (NEISS) database covering calendar years 2002 to 2009.

Scenario		N	% of 221 total injuries
Animal strikes human, human strikes farmstead structure (e.g. fence, gate, post, wall)		63	28.51%
Definite		63	28.51%
Examples:	CPSC Case 90101936. COW PUSHED HIM INTO A WALL. DX ASTHMATIC BRONCHITIS, LUMBAR CONTUSION.		
	CPSC Case 90803539. 48 YOF, HAND CAUGHT BETWEEN A COW AND A FENCE, FRACTURE HAND.		
	CPSC Case 20532477. RT RIB PAIN X 1 WK. HIT BY COW, THROWN INTO GATE. DX; RT RIB CONT.		
Probable		0	0.00%
Cattle handling, but contact with animal not explicitly mentioned		45	20.36%
Definite		17	7.69%
Examples:	CPSC Case 80124411. L SHOULDER PAIN AFTER ROPING CALVES. DX; SHOULDER DISLOCATION.		
	CPSC Case 90860200. CABLE TO FENCE BROKE WHILE HEARDING COWS AT HOME INJURING FINGERS. DX;"COMPLICATED LACERATIONS TO MIDDLE, RING FINGERS.		
	CPSC Case 81127299. PT FEEDING CATTLE & FELL OFF FENCE - NOT USING ARM, OCCURED SEVERAL HOURS EARLIER. CONTUISION ELBOW.		
Probable		28	12.67%
Examples:	CPSC Case 90308918. FELL ON METAL COW FEEDER;DX CONTUSED KIDNEY AND SPLEEN; DX CONTUSED UPPER TRUNK.		
	CPSC Case 40451220. CAUGHT FINGER IN GATE TO CATTLE CHUTE AT HOME. DX; LACERATION FINGER.		
Animal strikes farmstead structure (e.g. fence, gate, post, wall), object strikes human		41	18.55%
Definite		35	15.84%

Examples:	CPSC Case 90207125. COW PUSHED GATE OPEN AND GATE HIT FACE, HAS CONCUSSION, LACERATION TO FOREHEAD. CPSC Case 60607677. A COW BUMPED A GATE THAT HIT THE CHILD AND THREW HIM AGAINST A TRACTOR TIRE/LAC TO FACE AND MULTIPLE BRUISES.		
Probable		6	2.71%
Examples:	CPSC Case 30935178. PT WAS WORKING WITH CATTLE AND METAL GATE HIT PT IN HEAD CAUSING LOSS"OF CONSCIOUSNESS FOR UNKNOWN AMT OF TIME; HEAD CONTUSION, FX RT FACE. CPSC Case 21057251. PATIENT WAS KNOCKED OUT BY A CATTLE GATE. DX-CLOSED HEAD INJURY,SPRAIN LEFT WRIST.		
Tangled in rope		18	8.14%
Definite		17	7.69%
Examples:	CPSC Case 50849536. PATIENT WAS RIDING HIS HORSE, ROPING A CALF, GOT FINGER IN THE ROPE AND AMPUTATED IT. DX; AMPUTED L RING FINGER. CPSC Case 81042849. PATIENT HURT WHEN COW JERKED ROPE THAT HE WAS HOLDING COW WITH. HE WAS AT HOME. DX: RT SHOULDER PAIN.		
Probable		1	0.45%
Example:	CPSC Case 40834278. ROPING CATTLE DX FINGER FX, DISLOCATION AND AVULSION.		
Animal strikes human, no farmstead structures involved		15	6.79%
Definite		10	4.52%
Examples:	CPSC Case 60605239. PT WAS ROPING A 300 POUND BULL WHEN HE STRUCK HIS BACK - CONTUSION TO BACK. CPSC Case 71001562. CHI. PT WAS KICKED IN HEAD BY A COW AND FELL TO CEMENT FLOOR. CPSC Case 80936520. ABDOMINAL BLUNT TRAUMA/21YOF AT HOME RAMMED BY A MONTH OLD CALF WHILE TRYING TO WEAN HIM OFF BOTTLE.		
Probable		5	2.26%
Examples:	CPSC Case 20132094. PT RECEIVED BRUISE TO LOWER LEG WHEN KICKED BY A COW WHILE HOLDING ONTO A GATE.		

CPSC Case 70533306. KNOCKED DOWN BY COW COMING THROUGH GATE/ LT SHOULDER STRAIN.

Incident involving horse or ATV		
Contact by animal not explicitly mentioned	14	6.33%
Definite	11	4.98%
Examples: CPSC Case 20644500. PATIENT HURT WHEN 4 WHEELER TURNED OVER WHILE PULLING A BULL. (DOESN'T STATE IF JOB RELATED). DX: LEFT RIB (UPPER CHEST) CONTUSION.		
CPSC Case 70442592. PATIENT WAS HELPING DAD WORK COWS AND HAND CRUSHED BETWEEN PIPES AT FARM. DX; CONTUSION TO RIGHT HAND.		
Probable	3	1.36%
Examples: CPSC Case 20606614. WENT OFF EMBANKMENT WHILE ROUNDING UP CATTLE. NONWORK LACERATION TO FOREHEAD.		
CPSC Case 20741794. PATIENT JUMPED OFF HORSE WHILE ROPING A CALF AND NOW HAS LOW BACK PAIN. D: LUMBAR STRAIN.		
Contact between animal and horse/atv	8	3.62%
Definite	8	3.62%
Examples: CPSC Case 81146169. PATIENT HURT WHEN COW KNOCKED PT OFF 4 WHEELER AND THEN STOMPED ON FOOTAT HOME. DX: CONTUSION TO RT FOOT.		
CPSC Case 31103440. RIDING HORSE WORKING COWS AT HOME, COW RAN INTO HORSE KNOCKING DOWN HORSE AND RIDER INJURING RIBS. DX: FRACTURE RIBS.		
Probable	0	0.00%
Hurt while trying to escape from animal	9	4.07%
Definite	9	4.07%
Examples: CPSC Case 51040161. JUMPED ON FENCE TO GET AWAY FROM A BULL; HIT ANKLE ON FENCE; FRACTURE TO ANKLE.		
CPSC Case 31009446. 56 Y/O WHITE MALE FRACTURED HIP WHEN FELL OFF FENCE TRYING TO GET AWAY FROM COW AT HOME.		
Probable	0	0.00%
Cut/punctured while butchering animal	6	2.71%
Definite	6	2.71%

Examples:	CPSC Case 81035482. LACERATION FINGERS - 17 YO MALE PRESENTS WITH LACERATIONS TO 3RD AND 4TH DIGITS OF HAND FROM A KNIFE WHILE CLEANING A COW – TODAY. CPSC Case 30423022. LACERATION HAND - PATIENT REPORTS HE CUT HIS RIGHT HAND WITH A KNIFE WHILE BUTCHERING A COW.		
Probable		0	0.00%
Cut/punctured while performing animal care		2	0.90%
Definite		2	0.90%
Examples:	CPSC Case 20511679. WAS CASTRATING A BULL WHEN GOT KICKED WHILE HOLDING A KNIFE. LACERATION AT DORSUM LT HAND 2CM. CPSC Case 20334895. PT CUT HAND WITH KNIFE WHILE CASTRATING CATTLE DX: LACERATION RIGHT HAND.		
Probable		0	0.00%
Total		221	100.00%

*Animal refers to cow, calf, calves, bull, steer, heifer or cattle

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