Although the number of fatal occupational injuries in agriculture (2011 U.S. Bureau of Labor Statistics) has been declining at a rate of about 30% since the early 1990s, and has reached a level of 3.5 fatalities per 100,000 Full Time Equivalents (FTE), the number of deaths in agriculture, forestry, fishing, and hunting is still disproportionately large. The absolute number is not as high as in other occupation groups such as transportation and construction, but the rate per 100,000 employed (26.8) is the highest because there are far fewer people employed in agriculture than other comparable occupations.

About 25% of these fatal injuries in agriculture occur in animal production, of which an extremely large percentage (81%) occurs in Cattle Ranching and Farming as opposed to other animal production related sectors such as hog and poultry farming (Figure 1). A high percentage (63%) of the fatal work injuries occur among Hispanic or Latino workers, 60% of which were born outside the United States. Of the foreign-born workers who suffered fatal injuries in the US in 2010, 38% were born in Mexico, 21% in Asia, 12% in Europe, and another 19% from other countries in Central America. Fatal work injuries involving Hispanic or Latino workers continued to decrease in 2010 after reaching a series high in 2006.

In terms of nonfatal injuries and illnesses, the U.S. Bureau of Labor Statistics reports, that the average across all industry sectors combined was 3.5 injuries and illnesses per 100 employees.
The rate per 100 employees in agriculture, forestry, fishing and hunting is 4.5 injuries and illnesses per 100 employees. Rates in crop production and animal production are 4.5 and 4.4 respectively; however this does not include farms with fewer than 11 employees, which may underestimate these numbers substantially. Over all occupations, farmers and ranchers have the fourth highest fatality rate 41.4 per 100,000, only trailing fishers, logging workers, and aircraft pilots and flight engineers. 

One of the most common causes of death and serious injury on farms is related to the use of heavy equipment required to run a dairy farm. A high number of farming fatalities are due to tractor turnovers. Other causes of farm-related fatalities include silage bunker collapse, manure pits, tractor power take-offs (PTO), and large animals, such as dairy bulls. Recent research studies show that the two main causes of workers’ injuries (fatal and non-fatal) are incidents with machinery and animals (Mitloehner and Calvo, 2008). Machine-related accidents include tractor rollovers, being run over by tractors, and being entangled in rotating shafts. Animal-related injuries include kicks, bites, and workers being pinned between animals and fixed objects. Other causes of injuries include chemical hazards, confined spaces, manure lagoons, use of power tools, and improper use or lack of personal protective equipment (Mitloehner and Calvo, 2008).

Results from a study (Douphrate et al., 2006) analyzing 2000-2004 Colorado workers’ compensation claim data indicated that Colorado injury rates were higher than nationally reported numbers, especially in sectors that involve interaction with animals or livestock. Injuries related to animals, strains, machinery, and falls or slips were the most frequent among all occupations analyzed. The authors concluded that the development of safety interventions that address the worker-animal interface, fall protection systems, machinery usage, and overexertion prevention strategies were recommended.

In a subsequent study (Douphrate et al., 2009) it was determined that of the livestock handling injuries among dairy workers, nearly 50% were associated with milking parlor tasks. Furthermore, they determined that claims associated with livestock handling represented the highest percentage of high-cost and high-severity injuries of all animal production sectors.

**PROBLEM STATEMENT**

It can safely be postulated that the steady decline in fatalities in the last two decades is most certainly a result of increased emphasis on job site safety measures and training. However the lack of information regarding agriculture injuries or fatalities has been recognized as an obstacle for effective injury prevention (Zhou and Roseman, 1994). Because of the limited research addressing work injuries associated with livestock handling, little is known about the risk factors that might lead to the development of safety interventions. Data presented by Douphrate et al. (2009) show that major risk factors on a dairy are tasks in the milking parlor and behind cows.

The increased size of many of the southwestern dairies actually presents a unique opportunity for the development of safety interventions, since daily duties and tasks on the dairy have become highly specific and specialized. In the past, the task of training and supervision of employees typically was that of management (owner, manager). With increasing employee numbers, this task is often delegated to employees with seniority. Formal training, including basic and theoretical study, explaining the rational or the science behind particular work related activities is
not common. Often employees will know what to do (the task or activity) but may lack the knowledge of why. Insufficient understanding of the task can impact the outcome of the task in many ways: job motivation and hence job performance, thoroughness, expedience, accuracy, and finally, but not any less important, job safety. The organizational support to implement a successful training program has to be developed, and operational and managerial commitment to such a program is required.

Given the earlier observation that many work related injuries occur with workers from different geographical and cultural origins, it is imperative and appropriate that any safety training program developed be based on understanding of these linguistic and cultural barriers and attitudes towards working with animals and/or equipment.

**OBJECTIVE AND TASK**

The primary objective of this project was to develop a Comprehensive Dairy Safety Training program using video material, which would categorically highlight the safety concerns on a typical open lot dairy in the Southwestern US, and visually train the observer on how to avoid the risks and provide an intervention. The overall goal was to empower employees with a better understanding of animals, animal behavior, equipment, and equipment safety, all in order to reduce and better manage the risk factors as identified in earlier research (Douphrate et al., 2009).

**A COMPREHENSIVE PROGRAM**

This has led to the development of a comprehensive dairy safety-training program currently consisting of 2 DVDs (in English and Spanish) for on-dairy training purposes entitled *Considering Human and Animal Safety: Dairy Safety Training for Dairy Producers*. The format allows supervisors and managers to establish safety protocols for their individual farms. The program is based on the concept that well trained workers have high regard for their own safety as well as that of others, and the safety and well being of the animals in their care. The program can be regarded as an essential part of an overall Quality Assurance Program. The program raises awareness of unsafe or potentially harmful working conditions, which with early detection may take minimal correctional action. By presenting guidelines on how to safely handle dairy cows in various common situations on the farm, as well as how to work with heavy equipment in a safe manner, management can train both new and current employees. Emphasis is placed on understanding animal behavior as the basis for safely working with and around animals.

The first DVD was developed in 2010 and released in early 2011. Copies were distributed to producers in Oklahoma, Texas, New Mexico, and Arizona. In addition all attendees of the 2011 Western Dairy Management Conference were provided with a copy. To date, in excess of 3000 copies have been distributed to producers and allied industry. The International Refugee Committee (IRC, [http://www.rescue.org/news/photo-essays/new-roots](http://www.rescue.org/news/photo-essays/new-roots)) has requested permission to translate the DVD into other languages such as Burmese, to incorporate into training of refugees, which are to be placed on dairy operations in the U.S. The DVD has two menu options, either English
Crucial in the development of the DVD was coverage of specific risk areas on the dairy and highlighting areas of need and care, while at the same time leaving room for producers to utilize their own dairy specific procedures and protocols. It was also imperative that the approach be both from a human and an animal well-being perspective, since safety on the dairy is best served when and where the human caretaker understandingly and humanely interacts with the animal and mistakes in terms of caretaking are minimized and prevented. Illustration and documentation of this aspect of animal production is becoming increasingly important to consumers and retailers at large, and can help to instill an image of a quality dairy product, produced in a safe environment; both from a human as well as from an animal perspective.

Specific areas covered in the Considering Human and Animal Safety DVD are:

- Animal handling in treatment chutes
- ATV safety
- Cattle flight zone
- Cattle point of balance
- Chemical safety
- Eye and ear protection
- Milking barn safety
- Moving cattle safely
- Properly immobilizing cattle
- PTO safety
- Safety around bulls
- Safety around electricity
- Safety around heavy equipment
- Safety around the silage pile
- Safety in the machine room
- Understanding how cattle see
- Waste lagoon safety
- Working with self-locking stanchions

While developing the first DVD, it was soon realized that the material covered was extensive, yet of a general nature, and that for specific positions on the dairy more in-depth, and specific safety training was required. With input from producers who had worked with the first DVD, it was decided to develop a second safety training DVD which would extensively cover issues pertaining to each one of the major positions on the dairy: the outside cow caretaker and calf caretaker, the milker, and the feeder. This way a new employee will be able to receive general training on safety issues across the dairy, as well as specific safety training for the position or positions they hold. Current employees can uniformly be trained or cross-trained for different positions on the dairy, and training can be standardized without personal interpretation or procedural drift. Additionally the training can be documented, a benefit for the producer, as well as employee. A menu option allows for selecting the specific position. The 2<sup>nd</sup> Dairy Safety Training DVD Considering *Human and Animal Safety Part II* was released in the summer of 2012.
NEXT STEPS

After polling producers about their needs related to employee training and HR management in general, it is obvious that a comprehensive program is needed which gives producers the opportunity and quick and easy access to not only perform the initial, the follow-up and the cross trainings, but in addition have a tool which provides the opportunity to document, examine and evaluate the results of the training. Secondly the need was expressed to be able to examine and evaluate employee performance on a consistent base, and again document this information. Thirdly producers would like to have a place where they, as well as their employees, can access the most recent protocols and BMP’s for any dairy related task. Basically, what producers are asking for is an easy-access, one-stop-shop for HR and Employee management.

In response to this expressed need we are currently developing an on-line dairy resource for producers to be able to provide on-line training and evaluation, which automatically will be attached to the employee’s record. At the site producers will also be able to develop job descriptions and evaluations as well as their dairy-specific protocols. In addition the website will have all the safety training videos as well as technical how-to clips on topics such as milking, calving, treating animals, dehorning, hoof trimming, euthanasia and other stockmanship skills as well as specific cow-side training modules using interactive mobile devices such as I-pads which an employee can perform and instantaneously and simultaneously be evaluated on. This way employee training and performance records are only a push of a button away from managers and owners in case of an audit or evaluation. Simultaneously tools such as this can be connected to employees cellphones and alert them or remind them automatically of work schedules, schedule changes, relief shifts, and other pertinent information a manager needs to be able to relay to his crew. Alternatively, employees while out in the corrals can report back information in regards to situations that need immediate attention, and possibly at some time direct access to cow records for treatment options, etc. In reality, the opportunities and possibilities to assist management and employees with an on-line interactive program such as described here, are endless and can be customized to each dairy producer’s desires or needs!

Full references for the literature cited can be obtained from the author. This article was prepared from a presentation at the 2012 High Plains Dairy Conference in Amarillo, Texas.
## 2013 Upcoming Events

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<th>Month</th>
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<td>February 12-14</td>
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<td>World Ag Expo</td>
<td>Tulare, CA</td>
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<td>February 19-20</td>
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<td>NM Ag Expo</td>
<td>Roosevelt County Fair Grounds, Portales, NM</td>
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<td>February 21-22</td>
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<td>Southwest Nutrition Conference</td>
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<td><strong>MARCH 2013</strong></td>
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<td>March 6-8</td>
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<td>Western Dairy Management Conference</td>
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<td><strong>APRIL 2013</strong></td>
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<td>April 4-5</td>
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<td>Dairy Calf and Heifer Association 2013 Conference</td>
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<td>April 16-17</td>
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<td>Western Dairy Air Quality Symposium 2013</td>
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<td>April 10-11</td>
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<td>Mid-South Ruminant Nutrition Conference</td>
<td>Grapevine, TX</td>
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<td><strong>MAY 2013</strong></td>
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<td>May 14-June 21</td>
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<td>SGPDC-T Large Herd Dairy Management Class</td>
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<td><strong>JUNE 2013</strong></td>
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<td>June 7-8</td>
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<td>DPNM Annual Convention and Trade Show</td>
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<td><strong>JULY 2013</strong></td>
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<td>July 8-12</td>
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<td>ADSA /ASAS Joint Annual Meeting</td>
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