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Needs Assessment for Promoting Livestock and Equine Safety for Diné Youth

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NEEDS ASSESSMENT FOR PROMOTING LIVESTOCK AND EQUINE

SAFETY FOR DINÉ YOUTH

by

Karah Shumway

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Agricultural Systems Technology
(Agricultural Extension Education)

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2013

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ABSTRACT

Needs Assessment for Promoting Livestock and Equine
Safety for Diné Youth

by

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Utah State University

Major Professor: Dr. Michael L. Pate
Department: Agricultural Systems Technology and Education

The purpose of the research was a formative assessment of Diné (Navajo) parents and community leaders' needs for a training program for the prevention of livestock injuries including those that are horse-related. The research objectives were to identify parents' perceived livestock and horse related injury risks to Diné children and describe Diné community stake holder input on prevention interventions for reducing injury risks to children associated with livestock and horse-related activities on the farm or ranch. The assessment utilized a survey constructed of closed and open-ended questions to gauge Diné farmers' and ranchers' perceptions of injury risks to children who live or work on an agricultural operation. Additional questions were asked to gauge Diné acceptance of an online training program as a prevention intervention to reduce livestock and horse-related injuries to children. A total of 96 individuals agreed to participate in the survey and provided usable responses. A total of 53% of participants were female.

There were 58 individuals who perceived that a youth who worked with intact male livestock was at a high risk for injury. A total of 25 individuals perceived that a youth who rides a horse without an equestrian riding helmet was at a high risk for injury. There were 48 individuals who strongly agreed that they would utilize an interactive internet resource to promote agricultural safety for Diné youth. There were 22 individuals who strongly agreed that they would utilize internet social networks to promote agricultural safety and health for Diné youth. This project may serve as a model of collaboration to help researchers address the agricultural safety needs of other vulnerable populations. When participants were asked if there were safety issues associated with having youth working on the farm or ranch, a very large portion felt that the biggest issue was a lack of education and instruction from their elders.

(72 pages)

PUBLIC ABSTRACT

Needs Assessment for Promoting Livestock and Equine

Safety for Diné Youth

by

Karah Shumway, Master of Science

Utah State University

This project was funded through the National Children's Center for Rural and Agricultural Safety and Health as part of the pilot study program for 2011-2012 fiscal year. The project team proposed a one-year, \$19,991 project to conduct a formative needs assessment of Diné parents for the prevention of agricultural injuries to children who are helping farm or ranch. The assessment utilized a survey constructed of closed and open ended questions to gauge Diné farmers' and ranchers' perceptions of injury risks to children who live or work on an agricultural operation. Additional questions were asked to gauge Diné acceptance of an online training program as a prevention intervention to reduce livestock and horse related injuries to children. Data was collected via survey and open-ended questions, concerning the safety of youth working with livestock and equine. Several key partnerships were developed between Jeannie Benally, Shiprock Federal Tribal Extension Agent, and TahNibaa Naataanii, Diné Bé Iiná Project Director. Several parents from 4H clubs provide supportive comments and indicated they wished to see continued collaborations. A total of 96 Navajo Nation members agreed to participate in the survey and provided usable responses. All participants lived within

Navajo Nation boundaries in the four-corners area of Utah, New Mexico, and Arizona.

The research project was reviewed and supported by the Northern Navajo Agency members. The research protocol was approved under Utah State University's Institutional Review Board under protocol number 4164 and through the Navajo Nation Human Research Review Board under protocol number NNR-11.340. All data and intellectual property developed through this research project are the sole property of the Navajo Nation.

Through this needs assessment, more can be understood about the risks faced by Diné children who are exposed to agricultural work. An increased awareness about agricultural injuries and how to prevent injuries to their children, as seen through the lens of community stakeholders, will be essential in the development of culturally and geographically relevant safety information to prevent agricultural injuries to Diné children. The majority of participants found a lot of activities performed on the farm or ranch to be dangerous and found a need for safety training courses along with the use of social media and online prevention interventions. A recommendation for practice included the development of a user-friendly network for parents and leaders to access resources to assist in the education of the youth in local agricultural traditions integrated with safety training.

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I would like to express my very great appreciation to Dr. Michael Pate for his valuable and constructive suggestions during the entire planning and development of this research project. His willingness to give his time so generously has been very much appreciated. I would also like to thank my committee members, Drs. Lyle G. McNeal, Brian K. Warnick, and Rebecca G. Lawver, for all of the support, encouragement, and assistance that they gave me throughout the entire process.

I would also like to give special thanks to all participants for their willingness to participate and for their contribution and recommendations that were given. I am particularly grateful for the assistance given by Jeannie Bennally and TahNibaa Naataanii for allowing us to attend activities they organized to collect data.

I would like to extend very special thanks to my family and friends for their love, support, patience, and encouragement throughout the entire process.

Karah Shumway

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CHAPTER I

INTRODUCTION

Animal agriculture has been credited as being a source of one-sixth of human food energy and more than one-third of the protein on a global basis (Bradford, 1999). Most of this food production is a result of ruminant animals' ability to convert human-inedible forages from rangelands into meat, milk, or fiber for human use. The US Forest Service (2009) estimated that there are 770 million acres of rangeland in the United States. Bradford stated that most of this land is non-arable and that cultivation is impractical due to limited rainfall and soil conditions. These lands could not be utilized for food or fiber production if it were not for grazing of ruminant animals. In the intermountain west, rangeland operations still rely on horses for herding cattle and sheep. Riding horseback allows ranchers to travel over more land that would otherwise be too difficult to manage. Much of the intermountain west grazing environment for livestock is semi-arid, steep, rocky, and covered in brush and trees, making it extremely difficult, if not impossible for motorized vehicles to pass. The use of horses to navigate through thick brush and rocky ledges to ensure the wellbeing of their livestock or to bring them in to be sold or medically treated is essential.

Agriculture remains one of the most dangerous occupations in the United States, behind fishermen, loggers, and pilots (Holbrook, 2011). Incidents associated with cattle and horses are among the most common cases of injury (McCurdy & Carroll, 2000). Miller, Webster, and Mariger (2004) found that in Utah, livestock were the primary

source of injury to farmers and ranchers. Horses accounted for 42.3% of these self-reported injuries.

Equestrian injuries are a common sight at trauma centers, where the severity of the injuries range from fractured extremities, soft tissue, intracranial, and internal injuries (Smith, 2004). One in five equestrian riders will be seriously injured during their riding career. Novice riders experienced a three times greater occurrence of injury over the intermediate riders. They experienced five times the occurrence over advanced riders and nearly eight times more than professional equestrians (Mayberry, Tuesday, Wuger, Diggs, & Mullins, 2007). Children are at a much greater risk for horse-related injuries due to the lack of experience, increasing the need for greater injury prevention efforts for youth. At a level 1 pediatric trauma center, clinical pediatrics found that out of 96 children treated for farm related injuries, 36 of the patients suffered from equine related injuries. A 10-year-old boy sustained a severe brain injury and prolonged a coma, due to being kicked in the head by a horse, while an 8-year-old boy died of massive brain injury with a large open depressed skull fracture also after being kicked in the head by a horse (Smith, 2004).

In many situations, children who are not exposed to programs such as 4-H, riding clubs, or riding lessons do not learn the basic safety skills that would be taught in a structured environment. Although 4-H does not have a program that is designed specifically for the youth to teach correct skills that will reduce the risk of injury, they do teach proper horse handling skills that will reduce the probability of injury. Farm and ranch children, along with Diné youth, who are expected to use horses as tools in their daily activities on family operation are regularly put into situations that put them at risk

for injury. They encounter unfamiliar terrain, risk being struck by tree branches, have to travel over rocky territory, risk having their horses spook from birds or other animals startling them and, when working livestock such as cattle and sheep, the probability of injury increases dramatically.

When working on the farm or ranch, the importance of safety is often overlooked and even ignored. Time is very valuable and in essence, determines many actions of workers and how the operation is ran. When shortcuts can be taken to minimize time, laborers are going to take advantage of that, when this attitude is applied, the risk of injury increases and puts all those involved in greater danger. With head injuries being the most common reason for equestrian death or admittance to hospital (Mayberry et al., 2007), it is important that they are informed of the risks involved. Injuries can occur from not only riding but also from grooming or groundwork from the horse stepping on the individual working the animal. No matter the amount of training a horse has, they will still be unpredictable. Increasing the amount of danger is the distance from the ground, which can be up to three meters high. In addition, when the speed of the horse is increased, the risk for serious injury exceeds the risk that is involved in automobile and motorcycle racing (Brady & McKee, 2004). According to Ultimate Horse Site (2005), a horse can reach a moving speed of 7-10 miles per hour at a trot, 10-17 miles per hour at a lope, and top speeds of 50 miles per hour at a gallop. A human skull can be shattered at speeds of 4-6 miles per hour, which illustrates that a fall from a moving horse could cause serious injury or death (Brady & McKee, 2004).

A great tool that is often overlooked that will significantly reduce the severity and protect against injury is the use of a helmet. Helmets are used in a variety of recreational

activities as well as athletic sports, such as football, bike riding, hockey, skate boarding, skiing and so forth. They are also used in many different equestrian events, such as, hunter/ jumper, English, dressage, and endurance riding. The United States Pony Club has required American Society for Testing Materials (ASTM) certified helmets since 1990. A 2-year surveillance study showed that head injuries declined by 26% in addition to a 63% decline in facial injuries and a 29% decline in concussions (Nelson, Rivara, & Condie, 1994). However, some western-style riders may view the use of equestrian helmets as uncomfortable or unacceptable in appearance (Floyd & Evans, 2009). These perception barriers may be linked to social and cultural influences.

The type of equestrian activity youth are engaged in may impact their perception of equestrian helmets. Nelson et al. (1994) found that out of 900 English-style riders, 57.5% wore helmets on their last ride, which compared to the 684 Western-style riders, where only 11.8% wore helmets on their last ride. These western-style events simulate the work tasks involving the use of a horse on farms and ranches. There is frequently an image that those who wear helmets are not “true cowboys/ cowgirls.” This perception may serve as a significant social barrier to the usage of a helmet.

Additional barriers and lack of training may be linked to variation in cultural practices in agriculture. It has been shown that injury and death rates associated with agricultural work are significantly different between certain subpopulations (McCurdy & Carroll, 2000). Diné (Navajo) farmers and ranchers are highly involved in livestock production in the states of Arizona, New Mexico, and Utah. It is estimated that the Navajo Nation population is more than 250,000 individuals. Moore, Benally, and Tuttle (2008) stated that a large portion of people who are part of the Diné Nation, one of the

largest Native American Tribes in the United States, are engaged in livestock production. The Navajo-Churro Sheep along with goats, cattle, horses and llamas make up a majority of the livestock production. Helitzer, Willging, Hathorn, and Benally (2009) stated that data on agricultural injuries in American Indian populations are limited. Moore et al. (2008) indicated that livestock exhibit the cultural values that developed since the historical acquisition of domestic animals and farming practices. Very little is understood about the hazards and training needs of Diné farmers and ranchers.

Farming and ranching is often a family affair. Children are allowed and often expected to assist in the tasks that will be done around the farm. In 2006, youth living on livestock operations had a significantly higher rate of injury (11.9 injuries/1,000 youth) compared to their counterparts in crop operations (8.4 injuries/1,000 youth) (NCCRAHS 2011). In a study done in a level 1 pediatric trauma center in Ohio (by Clinical Pediatrics), ninety-six children were admitted during a 9-year period to the trauma center for treatment of farm-related injuries. Thirty-nine patients (40.6%) had an animal-related injury, including 36 children (37.5%) who had an injury associated with a horse (Smith, 2004). According to the 1996 National Action Plan and the 2001 Summit on Childhood Agricultural Injury Prevention, there is a major gap in providing culturally relevant and applicable agricultural safety training to underserved populations including Native American children. Unsafe behaviors are often attributed to factors such as an individual's attitude, perceptions, and/or lack of knowledge (Mosher, Keren, Freeman, & Hurburgh, 2012). Very little is understood about the risks faced by Diné children who are exposed to agricultural work related to horses and livestock.

Statement of Problem

Crandall, Fullerton, Olson, Sklar, and Zumwalt (1997) and Fullerton, Olson, Crandall, Sklar, and Zumwalt (1995) found farm-related injury death rate among adult American Indians was 51.2 per 100,000 people per year, which was twice the rate of Anglos and Hispanics combined. Over 56% of Navajos live below the poverty level. Additionally, there is a high drop-out rate among high school students (Moore et al., 2008) Through this needs assessment, more can be understood about the risks faced by Diné children who are exposed to agricultural work involving horses and livestock. An increased awareness about agricultural injuries and how to prevent injuries to their children, as seen through the lens of community stakeholders, will be essential in the development of culturally and geographically relevant safety information to prevent agricultural injuries to Diné children.

Assumptions

It was assumed that most participants would be willing to complete the survey along with the open-ended questions. Most participants would have access to the internet at work, home, or on a mobile device. It was assumed that participants would find a need for change and be willing to address the problems that they face daily to save the traditions of the Diné people. Participants' ability to travel to and from safety training events would be possible.

Limitations

Caution should be used when generalizing the results of this study to other populations. This study was limited to individuals from the Northern Navajo Agency. The Navajo Nation is comprised of five agencies. This needs assessment should be conducted with members of the remaining agencies that are a part of the Navajo Nation. An additional limitation of the study is the relative small number of participants in the study. However, only parents or individuals hiring Diné youth to work on the farm or ranch were asked to participate, limiting the number of individuals eligible to participate. Input should be gathered from additional members of the community to validate the findings of this study.

Definition of Terms

4-H Member – A young person aged 9-19 who actively participates in 4-H activities.

4-H Horse Program – An experiential education experience centered around horses and available to 4-H members.

Agriculture safety and health– Focuses on the safety concerns of agriculture, along with the health factors involved with production agriculture.

Diné– Navajo People also known as Navajo Indians.

Equine– Pertaining to horse lineage.

English riding – A form of riding with many variations, but all feature a flat English saddle without the deep seat, high cantle or saddle horn as seen on a western saddle.

Helmet– A device worn on the head to protect and prevent head injury.

Internet– A network of computers that link computer networks worldwide. It includes commercial, educational, governmental and other networks, all of which use the same set of communications protocols.

Livestock– Cattle, sheep, goats, horses, and any other animal that are on a farm or ranch.

Social media– web sites and other online means of communication there are used by large groups of people to share information and develop social and professional contacts.

Western riding – A riding discipline evolving from ranch traditions; riders use a western saddle and control the horse with one hand while performing various maneuvers.

CHAPTER II

THEORETICAL FRAMEWORK

The theoretical framework for this study was constructed using the theory of narrative learning programming, social marketing as an intervention development strategy and the potential use of the internet as a tool to promote social and cultural safety norms in Diné agricultural practices.

Murphy (2003) pointed out a myriad of compounding factors limiting the traditional “expert-novice” teaching approach to farm safety and health education including agricultural health and safety specialists lack of expertise in methods of training/education, their lack of production agriculture experience, their relative infrequent contact with learners, and the consistent reinforcement of at-risk behavior due to the infrequency of actual injury from at-risk behavior. Traditionally farm safety has focused on getting the “facts” out to the populations served by agricultural health and safety professionals. However, Bandura (1994) stated that the sole approach of “getting the information” out has little influence on entrenched health-impairing habits. Bandura (1994) argued that individuals need to have the motivation, resources and social supports to be successful in addition to the information on how to change their habits. Effective self-protection action against an equestrian or livestock related incident may require social and self-regulated skills and a high sense of self-efficacy to exercise control over hazardous situations (Bandura, 1994).

An alternative view which utilizes learner-centered approaches incorporating and acknowledging socio-cultural influences could bring promise to influencing behavior

change among the clientele we serve. From this model human behavior becomes much more dynamic. Culture shaped by our social interactions influences the development of schemas through which people interpret, believe, know, evaluate, and act.

An example of a narrative learning program is Cole, Kidd, Isaacs, Parshall, and Scharf's (1997) conceptual model of narrative representation which integrates behaviorists, constructivist, and socio-cultural views of learning. Cole et al.'s approach to safety training involves the use of narrative storytelling of plausible farming scenarios to guide the learner into engaging in metacognitive thought when approaching management of work tasks. Through the use of narrative case studies promotes the developing self-regulation through contextualized or authentic activities integrated with the culture in which the target behavior is desired (Brown, Collins, & Duguid, 1989). The goal of the program is to raise the learner's perception of the significance of working safely in agriculture. The instruction focuses on helping the learner engage in transferring their learning to similar experiences. Narrative training programming is centered within the constructivist based learning paradigm which suggest that numerous influences such as family traditions and traumatic events can shape the adoption or learning of behaviors as well as modify well established behavioral patterns (Bandura, 1986, 1994). Murphy (2003) documented this through the explanation of the "farm safety – risk paradox" where cultural influences and everyday experiences shape the attitudes and behaviors of farmers. This approach requires a thorough understanding of the social and cultural practices of the learner to adequately prepare narrative scenarios for training. A formative needs assessment would allow for qualitative and quantitative data collection on risks and perceptions of training. This information would help in the

preparation of such a program for Diné youth. To accomplish this, input and collaboration from Diné community members and parents who farm and ranch would be significant. A lack of community support for livestock safety programming could prove to be a significant barrier.

Yoder and Murphy (2012) suggested that identifying and understanding barriers to and motivators for behavior change is central to social marketing. Social marketing is considered a safety and health intervention development strategy whereby formative needs assessments are conducted to identify a population's barriers and motivators to adopting desired safety behaviors (Yoder & Murphy, 2012). The components of audience analysis and analysis of communication channels are central to developing interventions for behavioral change through this approach (Lefebvre & Flora, 1988). Yoder and Murphy (2012) stated that the usage of Facebook and Twitter can be utilized in social marketing. Understanding factors that influence and shape Diné hazard perceptions could assist in the development of agricultural safety training that integrates socio-cultural motivators/barriers and self-regulated skill development activities in order to more effectively change youth work behaviors. Still, attitudes toward agricultural safety programs are often negative, particularly if delivered by professionals with no farming experience. Therefore, agriculture safety programs that can be delivered by culturally respected individuals within communities are needed. Parental role models, extension professionals and community leaders can serve as "change agents" in their communities by communicating "scientific knowledge" in ways that are meaningful to the local population they serve (Neufeld & Cinnamon, 2004).

Empowering the Diné local and culturally respected individuals with safety training resources could be effectively done through an internet resource and social media campaigns. Due to geographic isolation and limited means of transportation faced by the Diné, face-to-face training events may be difficult to impossible to attend affording the use of internet to better serve community members. The use of internet would allow the communication of safety information to individuals who have access to the internet but would otherwise be isolated due to logistical challenges. Rhoades, Irani, and Myers (2008) stated that with Internet usage in the United States at an all-time high, information technology use in education has continued to increase. Rhoades et al. have shown that many students are utilizing these materials to search out information and assist with completing class assignments. Students described the internet as a functional tool that helps them to communicate, conduct research, and access library materials (Rhoades et al., 2008). Because many are familiar with these programs and the technology involved, instructors can utilize the communication tools in these programs to engage students in a manner that is comfortable and enjoyable. An example of utilizing these resources was the posting of announcements. These technologies offer students a real world example to draw from during discussions on information credibility and online resources.

There are challenges with utilizing an internet resource and social media among the Diné. A comparison of the access to technology on Native American reservations with urban American settings reveals a great divide. For example, only 39% of Native Americans living in rural areas have telephone service, while 94% of Native Americans living in urban areas have access to such service (Bissell, 2004). Bissell noted that Native Americans living on reservations disproportionately lack access to fundamental

telephone, cable, and computer service due to poor infrastructure. Despite recent proclamations that the vast disparity in access to information and communication tools, such as the Internet, between the rich and the poor has narrowed, the digital divide is still a very real concern for Native American tribes (Bissell, 2004).

It is important to translate research findings into prevention practices and products by utilizing the collective expertise of community leaders so that targeted safety and hazard recognition are meaningful and relevant to the target population. By strengthening partnerships between local community members and agricultural safety professionals, a trusted and lasting relationship to conduct safety interventions can be developed. The development of a narrative training program to change Diné youth's safety behaviors and risk-taking perceptions may reduce the likelihood of injuries associated with horses and livestock. By conducting this needs assessment, more can be understood about the risks faced by Diné children who are exposed to agricultural work. An increased awareness about agricultural injuries and how to prevent injuries to their children, as seen through the lens of community stakeholders, will be essential in the development of culturally and geographically relevant safety information to prevent agricultural injuries to Diné children.

Purpose

The purpose of this study is to provide a formative needs assessment of Diné parents for the prevention of childhood injuries resulting from livestock and horses.

Objectives

1. Describe demographic characteristics of Diné parents and community stakeholders that farm or ranch in the four-corners area of Utah, New Mexico, and Arizona.
2. Identify parents' and community stakeholders' perceived injury risk to Diné youth related to livestock and horse related agricultural practices.
3. Identify parents' perceived need for safety training to reduce livestock and horse related injury to Diné children.
4. Describe Diné parents' input on the use of social media as a tool to educate parents about livestock safety.
5. Describe Diné community stakeholder input on reducing children's livestock and horse-related injury through online prevention interventions.

CHAPTER III

METHODOLOGY

The research project was reviewed and supported by the Northern Navajo Agency members. The research protocol was approved under Utah State University's Institutional Review Board under protocol number 4164 and through the Navajo Nation Human Research Review Board under protocol number NNR-11.340. All data and intellectual property developed through this research project is the sole property of the Navajo Nation.

Participants

The population of this study included attendees of local events held for Diné farmers and ranchers in the northwest region of New Mexico, northeast region of Arizona and the southeast region of Utah. This area included the Northern Navajo Agency of the Navajo Nation. The local events included fairs, 4-H parent meetings, and livestock exchanges. This event provided a convenient location for the researchers to interview Diné families and community stakeholders who may hire youth to work on Diné farms and ranches. Criteria for individuals to participate include individuals who are 21 years of age or older and are members of the Diné (Navajo) Nation engaged in production agriculture. Additional inclusion criteria include families with children under the age of 18 years old engaged in farm and/or ranch work or individuals hiring children under the age of 18 for farm and ranch work. Participants were approached for participation through 4-H leader meetings, the Annual Sheep is Life Celebration, the Navajo Nation

Fair, and the Diné Bé Iná Ram exchange during 2012. It was explained that participation in the research was entirely voluntary. Participants were informed that they have the right to withdraw or refuse at any time during the study without harm or penalty. Participants were encouraged to ask questions about the study at any time. It was explained to participants that they could refuse to answer any or all questions. The anonymous nature of parent and community leaders' responses precluded follow-up of absent or non-responding individuals.

Project Design

This study is a mixed-methods study. A descriptive interpretive analysis was used to describe and interpret parents' concerns regarding livestock and horse related injury risks to Diné children. Diné ranchers and farms were surveyed on their perceptions of livestock and horse related injury risks to Diné children, utilization of Facebook and other online social networks, and internet access/usage. Data were evaluated to determine best practices for dissemination of research-based information on prevention of childhood agricultural injury through an online intervention. This allows proper assessment of audience preferences as they relate to website development and social network utilization, which should produce successful results for an online community for parents.

Instrument

Literature was reviewed to develop a sense of parents' perceptions of injury risk to children assisting on the farm or ranch (Hall, Dunkelberger, Ferreira, Prevatt, & Martin,

2003; Helitzer, et al., 2008; Howell & Habron, 2004; Rhoades et al., 2008; Tennessen, PonTell, Romine, & Motheral, 1997). The survey regarding website and social network usage was utilized to determine the need and applicability of an interactive online prevention program utilizing informational resources from the North American Guidelines for Children's Agricultural Tasks (www.nagcat.org) and Childhood Agricultural Safety Network (www.childagsafety.org). Questions were designed to gather perceptions of utility for the following interactive website components:

- Online video-learning modules and quizzes: Assists users in obtaining information related specifically to safety techniques for livestock production on the Navajo Nation, videos about agricultural safety and quizzes accessible on the website.
- Homepage Blog Roll: Allows visitors to see what new safety-related videos, news articles, testimonials and calendar events are posted online, a regularly-updated flow of information will be posted to the homepage.
- Related Links Section: A tab for related information will be included to encourage users to visit other agricultural safety websites and social media including: North American Guidelines for Children's Agricultural Tasks (www.nagcat.org) and Childhood Agricultural Safety Network (www.childagsafety.org).
- Feedback Link: Utilized to obtain information that will help us better serve the Navajo population while also gathering demographical information.
- Enabled Comments: Comments will be enabled for all features of the website, so that an interactive, community atmosphere is formed through discussion.

- Calendar: Allows visitors to view upcoming events from both our projects and those submitted to us by our partners.

Additional open-response questions were used to gain insight to understand participants' barriers to using safety equipment such as equestrian riding helmets. A descriptive interpretive analysis was used to describe and interpret parents' concerns regarding livestock and horse related injury risks to Diné children. Navajo ranchers and farmers were asked to describe their risk perceptions associated with livestock handling issues. Details of the questionnaire are given in Appendix A. Participants were asked to rate the degree to which children are at risk of a serious livestock and horse related injury, and to judge the impact of a serious injury or fatality on the operation of their family farm, details of the interview questions are given in Appendix B. The interview and questionnaire was reviewed and found to be content and face valid by education and extension professionals who have worked closely with the Navajo. Due the uniqueness of this specific population and limited comparison populations, Cronbach's alpha was used post-hoc to determine reliability coefficients for scales. Reliability coefficients were .85 for usefulness of interactive website components (6 items), .97 for youth task risk perceptions (35 items), .89 for parent training need perceptions (6 items), and .73 for general agricultural youth safety training need perception.

Open Ended Question Procedures

Participants were asked to respond to ten open ended questions regarding injury risks to Navajo children and the feasibility of an online educational tool. These questions were placed behind the survey as an option to complete but were encouraged to express

their concerns and suggestions. Ninety-six individuals completed the survey, while only 54 of those participants chose to take part in the open ended portion. Refreshments in the form cookies, chips, crackers and bottled water were offered to participants while they completed the survey. Utah State University apparel, such as hats and t-shirts, were offered to participants as an appreciation gift for completing the survey.

Data Analysis

Data were entered into PASW® version 18.0 for analysis. Descriptive statistics including frequencies, percentages, means, ranges, and standard deviations were calculated to summarize the quantitative data. Written responses from participants were open coded by the lead researcher. Data were analyzed for units of meaning such as words, phrases, sentences, and participants' ways of thinking that appear frequently and indicate importance. After coding, themes and categories were developed. Categories and themes were compared for distinctive characteristics and grouped into similar categories. This process continued until no new categories are generated and all code relationships were discovered. Member checking and investigator triangulation were utilized to ensure credibility of the qualitative analysis of participants' comments from open-end questions. Data were evaluated to determine best practices for dissemination of research-based information on prevention of childhood agricultural injury through an online intervention. After collecting data from the first events we reported our preliminary results to individuals at the following meetings and gatherings:

- Farmington, New Mexico-parent and leader 4-H meeting
- Shiprock, New Mexico- Diné Bi Iiná ram exchange

- Window Rock, Arizona- Navajo IRB
- Shiprock, New Mexico- Ag days.

After we presented the data we allowed them to also complete a survey, we encouraged them to leave feedback on our findings and also their opinion on the questions in the survey and open-ended questions. After completing the survey, many were hopeful and encouraged us to continue working, because numerous participants wanted assistance with starting programs within their area.

CHAPTER IV

RESULTS

The purpose of this study is to provide a formative needs assessment of Diné parents for the prevention of child injuries resulting from livestock including those that are horse related.

Research Objective One: Describe demographic characteristics of Diné parents and community stakeholders that farm or ranch in the four-corners area of Utah, New Mexico, and Arizona

Females represented the majority, as 53.2% ($f = 50$) were female and 46.8% ($f = 44$) of participants were male. Participant age ranged from 21 to 85 years old with a mean of 48.8 years old and a mode of 50 years old. The level of education of the participants ranged from the seventh grade to a Ph.D. level. There were seven participants who completed their associate's degree, 12 indicated having earned a Bachelor's degree, and 15 participants indicated having earned a master's degree.

Participants were asked if either a family farm, hobby farm, farm in partnership, or as a farm in corporation best described their farm or ranching operation. A total of 70 participants (75.3%) described their production operation as a family farm. Participants were asked to estimate the amount of land they operated in acres for crops, pasture, or range use. The average number of acres dedicated to crops was 32.68 acres ($SD = 262.34$). The average number of acres dedicated to pastureland was 679.82 acres ($SD = 5351.00$). The average number of acres dedicated to rangeland was 1521.16 acres ($SD = 5180.10$).

Participants were asked how many workers under the age of 16, including family members, assisted them with work tasks on their farm in 2011. There were 42.6% of participants indicating having hired 1-2 workers under the age of 16 on their farm or ranch, including family and non-family members. Few participants (19.1%, $f = 18$) indicated having hired three or more workers under the age of 16. Thirty-eight percent of respondents indicated having hired no workers under the age of 16.

Participants were asked if they worked off the farm more than 200 days during 2011. Working a day off the farm was defined as working an 8-hour work day involving non-farming or ranching employment. Participants were asked to respond either yes or no. A total of 61 participants (67.0%) responded they worked off the farm more than 200 days. Participants were asked to report their total gross farm income for 2011. Gross farm income was defined as the total farm income before subtracting expenses. Half of participants (50.6%, $f = 43$) indicated making \leq \$2,499. Few participants (11.8%, $f = 10$) indicated having a gross farm income greater than \$10,000. Participants were asked to report their net farm income was in 2011. Net farm income was defined as the gross of the farm income minus expenses. There were 38 individuals (48.1%) who indicated they broke even on their farm or ranch. Twenty-nine percent ($f = 23$) of participants indicate making a net profit. Table 1 provides the summary for frequencies and percentages of participants within each income category.

Table 1

<i>Farm Income (N = 96)</i>		
Gross Farm Income	<i>f</i>	%
≤ \$2,499	43	50.6
\$5,000-\$9,999	19	22.4
\$2,500-\$4,999	13	15.3
\$25,000-\$49,999	6	7.1
\$10,000-\$24,999	3	3.5
\$50,000-\$99,999	1	1.2
<i>Net Farm Income</i>		
	<i>f</i>	%
Broke even	38	48.1
Cost exceeded income in 2011	18	22.8
≤ \$4,999	15	19.0
\$5,000-\$19,999	6	7.6
\$20,000-\$49,999	2	2.5

Most participants (63.8%, $f = 60$) indicated that the majority of their farm or ranch was sheep and goats followed by horses and beef cattle. Approximately a third of participants indicate engaged in vegetable (36.3%, $f = 34$) followed by row crop production (25.5%, $f = 24$). A tenth of the participants indicated engaging in swine production. Table 2 provides a detail of the types of farm or ranch production that participants engaged in for 2011.

Table 2

Frequencies of Participants by Farm or Ranch Production Type (N = 96)

Type of Production	<i>f</i>	%
Sheep/ Goats	60	63.8
Horses	52	55.3
Beef cattle	47	50.0
Vegetables	34	36.2
Row Crops	24	25.5
Forage	24	25.5
Poultry	16	17.0
Fruit	16	17.0
Swine	10	10.6

Participants were asked if they used the internet to obtain information for operating their farm or ranch. There were 52 participants (54.2%) said that they did use the internet and 41 participants (42.7%) said that they did not use the internet. There were two participants that did not answer the question. Participants were also asked to briefly describe the type of activities researched. Responses included livestock information, management, prices, farming with drip irrigation, management of pest prevention, equipment operated on the farm, equine and vegetable information.

To gauge family members' internet accessibility, participants were asked how many members in their household used the internet for non-business purposes. Two participants did not answer the question. Approximately 20% of participants responding had at least two family members that used the internet for non-business purposes. There

were 63 participants (67%) who indicated three or more household members accessed the internet for non-business purposes.

To estimate the frequency of internet activity, participants were asked to indicate the number of times per week they go on the internet to obtain information. Almost half of participants (45.8%) indicated only getting on the internet between one and three times per week. Approximately 15% ($f = 14$) indicated getting on the internet multiple times per day.

Participants were asked to indicate the types of devices that they used in order to better estimate the degree of technology available for accessing the internet. A little over half of the participants (52.1%, $f = 50$) indicated using a personal laptop followed by 40.6% ($f = 39$) indicating using a personal mobile device. Few participants (10.4%, $f = 10$) indicated having no access to a computer or mobile device. Table 3 presents details of the frequency and percentages for devices used to access the internet by participants.

Participants were asked to indicate the type of search engine they used to find information over the internet. Over half (55.2%, $f = 53$) said they used Google with a third (34.4%, $f = 33$) indicating using Yahoo. Few participants (18.8%, $f = 18$) indicated using Bing to find information over the internet. Table 4 provides a summary of the frequencies and percentages of participants' activities performed over the internet. The largest number of participants (65.6%, $f = 63$) indicated using the internet to communicate via email. Over half (55.2%, $f = 53$) used the internet to access information about the weather. This was followed by 49.0% of participants indicating access technical information on agriculture through the internet.

Table 3

Devices Used by Participants to Access the Internet (N = 96)

Demographics	<i>f</i>	%
Personal laptop	50	52.1
Personal mobile device	39	40.6
Personal desktop	36	37.5
Work/business laptop	23	24.0
Work/business desktop	20	20.8
Work/business mobile device	16	16.7
Community/library computer	18	18.8
Personal tablet	10	10.4
No access to computer/mobile devices	10	10.4
Work/business tablet	4	4.2

Research Objective Two: Identify Diné parents and community stakeholders perceived injury risk to Diné youth related to livestock and horse-related agriculture practices

Over two-thirds of the participants (63.0%, $f = 58$) perceived youth working with stallions, bulls, and rams as a high risk for injury. Approximately 60% found the use of unfitted or incorrect equipment to be a high risk for injury. Riding in a parade was perceived to be a high risk by 25% ($f = 23$).

Table 4

Participants Type of Internet Usage (N = 96)

Type of internet usage	<i>f</i>	%
Personal communication through email.	63	65.6
Weather information	53	55.2
Technical information on agriculture	47	49.0
Read Navajo Nation News	41	42.7
Pricing information for agriculture inputs	34	35.4
Entertainment	28	29.2
Financial information	28	29.2
Information about agriculture commodity markets	20	20.8
Information on agriculture policy	20	20.8
Read Chapter News	16	16.7
Read blog entries	15	15.6
Information from chat rooms	8	8.3

Table 5 provides a detailed summary of the frequencies and percentages of participants who perceived selected agricultural practices as a high risk of injury to youth or children. A high number of participants, 81.6%, perceived mounting and dismounting a horse as a moderate to low risk. Seventy-eight percent of participants ($f = 72$) that indicated that leading a horse was a moderate to low risk for injury to youth. Approximately two-thirds of participants indicated that using a horse for herding/checking livestock was a low to moderate risk for injury to youth.

Table 5

Selected High Risk Agricultural Work Tasks (N = 96)

Work Task	<i>f</i>	%
Working with stallions, bulls, and rams	58	63.0
Riding as an extra on a tractor	55	60.4
Using unfitted or incorrect equipment	54	59.3
Riding young/ green broke horses	54	59.3
Riding ATV without an approved safety helmet	53	58.2
Jumping a horse	42	45.6
Using a tractor without roll over protection structures	38	41.3
Riding a horse that belongs to someone else	37	40.7
Catching a horse in a pen with other horses	37	40.7
Dragging something horseback	35	38.5
Competing in equine speed events	34	36.9
Roping horseback	30	33.0
Riding as an extra rider on a horse	30	32.3
Riding horses alongside a rode	28	30.8
Riding a horse without an equestrian riding helmet	25	26.8
Riding in a parade	23	25.3

Research Objective Three: Identify the community stakeholders' and parents' perceived need for safety training to reduce livestock and horse related injury risks to Diné children

Participants were asked to indicate their level of need for agricultural safety training on select topics. Three-fourths (75.8%, $f = 69$) indicated a definite need for training for working safely with tractors. This was followed by 72.0% ($f = 67$) indicating a definite need for a training program to promote working safely with horses. A little over a third of participants (36.6%, $f = 34$) indicated a definite need for use of respiratory protection equipment.

Participants were asked to please indicate the need for youth safety training on selected topics. Approximately 83% ($f = 76$) of participants indicated a definite need for safety training for youth working with tractors. Just under three-fourths of the participants (73.9%, $f = 68$) indicated a definite need for safety training for youth working in serious weather conditions. There were 55 participants (59.8%) who indicated a definite need for irrigation safety training geared towards youth. Table 6 provides a summary of the frequency and percentages for participants' low to moderate risk perceptions of agricultural activities. Table 7 presents a summary of the frequency and percent for participants indicating parents' safety training needs on selected topics. Table 8 provides the frequencies and percentages of participants that indicated they found a definite need for safety training for youth working on the farm or ranch.

Table 6

Moderate Risk to Low Risk Agricultural Work Tasks (N = 96)

Work tasks	<i>f</i>	%
Mounting and dismounting a horse	75	81.6
Leading a horse	72	78.2
Unloading hay and stacking on hay stacks	71	78.1
Competing in equine trail courses	71	77.2
Loading hay on trailers	70	77.0
Repairing a fence	69	75.9
Saddling a horse	69	75.9
Grooming	69	75.9
Trail riding	69	75.9
Tying a horse	68	74.8
Approaching a horse that is tied or staked	67	73.7
Cleaning hooves	67	72.8
Working cattle	66	72.5
Working around female livestock with young	66	72.0
Leading horses while horseback	65	71.5
Hobbling a horse	64	70.4
Using a horse while herding/checking livestock	62	66.6

Table 7

Need for Training Topics for Parents Working with Youth Around Livestock and Horses (N = 96)

Safety training	<i>f</i>	%
Working safely with tractors	69	75.8
Working safely with horses	67	72.0
Using ATV's safely while working livestock	67	72.8
Working safely with livestock	64	68.8
Preventing stress and strains while lifting or bending	59	64.1
Use of respiratory protection equipment	34	36.6

Table 8

Definite Need for Safety Training for Youth (N = 96)

Safety training	<i>f</i>	%
Safety training for youth working with tractors	76	82.6
Safety training for youth working in serious weather conditions	68	73.9
Safety training for youth working with equine	66	72.5
Safety training for youth irrigating	55	59.8

Research Objective Four: Identify Diné parents' input on the use of social media as a tool to educate parents about livestock safety

Participants were asked which types of social media that they utilize. The majority of participants (55.9%, $f = 52$) indicate using Facebook. Few participants

indicated using Twitter (11.7%, $f = 11$) and LinkedIn (10.6%, $f = 10$). Table 9 shows the frequency and percentage of participants' utilization of social media types.

Table 9

Utilization of Online Social Networks (N = 96)

Social media	<i>f</i>	%
Facebook	52	55.9
Twitter	11	11.7
LinkedIn	10	10.6
MySpace	9	9.6
Other	6	8.1
Ning	1	1.1

When participants were asked how often they used social media, 46.1% ($f = 41$) indicated using it one to three times per week. There were 15 individuals (15.6%) that indicated using social media once daily. Similarly 15 individuals (15.6%) claimed that they did not use social media at all. The majority of participants (87.1%, $f = 81$) indicated they agreed to strongly agree that they would utilize internet social networks to promote agricultural health and safety for Diné youth.

Research Objective Five: Describe Diné community stakeholder input on reducing children's livestock and horse related injury through online prevention interventions

Participants were asked the extent to which would utilize an interactive internet resource to promote agricultural health and safety for Diné youth. Approximately 96% ($f = 89$) of those surveyed strongly agreed to agreed that they would use it to promote

agriculture health and safety for Diné youth. A small percentage of participants (5.3%) did not agree they would utilize the internet in promoting health and safety for Diné youth.

Table 10 provides a detail of the frequencies and percentages of participants' computer education experiences. The most frequent computer education experience indicated by participants was a college course or online instruction. Almost a fourth of participants (22.6%, $f = 21$) indicated having no computer training or educational experience.

Table 10

Participant Computer Education (N = 96)

Test section	<i>f</i>	%
College course	29	31.2
Online instruction or course	29	31.2
Instruction from friends of family	23	24.7
None	21	22.6
High school course	6	6.5
Multiple formal educational sources	6	6.5
Instruction available in software programs	2	2.2

Participants were asked to indicate the usefulness of selected interactive website components to promote agricultural safety and health for Diné youth. When asked about the usefulness of an online calendar for visitors to view upcoming events from both our projects and those submitted to us by our partners, there were 83 participants (90.2%) that

felt that that would be extremely useful to somewhat useful. Approximately 84% of survey participants indicated that a comment web component to enable an interactive community atmosphere through discussion, would be extremely useful to somewhat useful. Seventy seven percent of survey participants ($f = 70$) indicated that online video-learning modules and quizzes would be extremely useful to somewhat useful to promote Diné youth safety on a farm or ranch. Only 3.3% ($f = 3$) indicated online video-learning modules and quizzes would not be useful.

Table 11

<i>Extremely Useful to Somewhat Useful to Promote Safety (N = 96)</i>		
Website component	<i>f</i>	%
Calendar	83	90.2
Enabled Comments	76	83.5
Related Links Section	74	82.2
Feedback Link	71	77.2
Online video- learning modules and quizzes	70	77.8
Homepage Blog Roll	66	74.2

Approximately 82% of survey participants ($f = 74$) indicated that the use of a related links sections to encourage users to visit other agricultural safety websites and social media would be extremely useful to somewhat useful. There were 71 survey participants (77.2 %) that indicated a feedback link to help better serve the Diné population would be extremely useful to somewhat useful. There were 66 survey participants (74.2%) who felt that a homepage blog roll would be extremely useful to

somewhat useful tool. Table 11 provides a detail of the frequencies and percentages of participants who found interactive website components extremely useful to somewhat useful in promoting the safety of Diné youth working on farming or ranching operations.

Participants' Open Response Themes

What is it like to be a Diné youth engaged in today's livestock and equine industry?

When participants were asked what they felt it was like to be a Diné youth engaged in today's livestock and equine industry, the researcher found a split response. Close to half of the participants that answered the question felt that there is not a great interest with today's youth and the agricultural industry. One participant said, "farming and ranching is decreasing more and more." An individual commented, "very few are involved, it depends on the family." The other half of the participants found that the youth today are involved in agriculture and that it is teaching the youth to work hard. An example of this was revealed in the comment, "It is something that the kids are finding out is a tough job but something they are awarded at the end."

When you think about their (Diné youth) future, what do you see them (Diné youth) doing?

There were three common perspectives taken on the future facing Diné youth, one was a more negative outlook where they felt they were falling away from the lifestyle they were brought up in, one was hopeful that they would continue on with their traditions, and the third was a positive feel that the youth would be able to continue working with livestock and making it a better life for themselves. A participant that was not so sure about the future of the youth stated, "Too much internet, not enough farming

or livestock.” These participant’s comments indicated a belief that Dine youth were becoming less involved in agriculture traditions. There was a comment that indicated the opposite perspective that, “they (Diné youth) are learning more about agriculture and Native traditions.” These comments indicated that the youth would continue to learn more about agriculture and excel in farming/ranching. The third theme indicated a belief that Diné youth would continue to practice traditions in weaving, herding, and riding horses. One stated, “I hope to see them continue the culture of raising animals.”

Are there safety issues associated with having youth working on the farm/ranch? If so, what are those issues?

There were 50 participants who provided comments regarding safety issues with having youth working on the farm/ranch. Several comments indicated the biggest issue was a lack of education and instruction from their elders. Participants’ comments indicated that being aware and paying more attention would prevent a lot of the safety issues with having youth working on the farm or ranch. They were also asked what specific concerns they had regarding injury risks. Several felt that not being familiar with tractors and other equipment would create a risk followed by a concern with irrigation ditch risks. Comments also indicated a concern with the drug and alcohol abuse.

Are you aware of specific injuries to youth working with livestock and horses? What are those injuries?

Participants were asked if they were aware of specific injuries to Diné youth working with livestock and horses, and if they could explain what those injuries were. There were 53 participants who answered with five commenting there were not aware of injuries to youth that are involved in working with livestock or horses. The remaining 48

participants indicated that youth experience a range of injuries while working on the farm or ranch. Twelve individuals commented that broken bones were very common followed by nine participants indicating that head/brain trauma was an injury concern. There were 12 individuals that felt that getting kicked or stomped on by livestock was a common injury experience by youth working with horses and livestock. One participant said, “I know a lady that was kicked in the side of the head when cleaning her horses’ hooves. She suffered a severe concussion, losing her memory and use of body parts, hands, legs, brain function, etc.” Other injuries that participants indicated were commonly experience were sprains, back injuries, cuts, loss of extremities, and even death.

What are positive activities you are involved with in your community to prevent injuries to youth working livestock and horses?

Participants were asked what positive activities they are involved with in their community to prevent injuries to youth working livestock and horses. The most frequent programs that parents indicated being involved with were 4-H and FFA. Only 10 out of the 51 participants commented they found these programs useful. There were 11 participants who stated that there were seminars and workshops around their area that they utilize to assist in teaching youth about safe livestock handling. There were nine participants who commented that they provided their own training for their children to perform tasks.

What do you see as the biggest challenge facing youth in your community?

Participants were asked what they believed was the biggest challenge facing youth in their community. Of the 54 participants who answered the question, 15

participants stated that the lack of family support, a consistent learning environment, or providing opportunities to stay home on farm were some of the biggest challenges. Many felt there was a lack of funding to provide youth with the chance to participate in agricultural activities, or they are not able to attend activities due to lack of transportation because parents are working. There were 13 participants who felt that safety is not present while working on the farm or ranch and that there is a need for a lot of training. One participant commented the challenge was to cover come western thinking. Many felt that there was a lack of youth wanting to learn about livestock due to a resistance from older generation to “new” techniques, and the language barriers between the older and younger generations. There were 12 participants who commented that the biggest challenges facing youth were staying in school, avoiding gangs, and peer pressure. A theme that arose from comments was a feeling that youth were bored and had too much idle time on their hands which parents stated was mostly occupied by time playing video games, drinking alcohol, and being involved in gangs. There were 11 participants that felt that youth are not interested, they have a lack of determination, lack of awareness, and a lack motivation. These comments indicated a feeling of frustration in getting the youth involved with participants commenting that there was a challenge in getting the youth to find working on the farm enjoyable.

What can parents do to make working with livestock and horses safer for youth?

When asked what parents can do to make working with livestock and horses safer for youth, all 54 participants comments indicated a feeling that adult supervision or teaching youth how to properly work with livestock would improve safe. Participants’

comments suggested that youth should be taught at home with positive reinforcement and patience from elders. Some participants' comments indicated a need for adults to attend workshops and learn proper practices so that they are able to return home and educate their children.

What kinds of opportunities for constructive after-school activities are available in your community? (UNITY youth council, Boys & Girls Clubs, Tribal Youth Program, Big Brothers/Big Sisters 4-H, FFA, HOSA, or Upward Bound).

To access available resources and potential collaborators for a youth agricultural safety program, participants were asked what kinds of opportunities for constructive after-school activities were available in their community. Nearly half of the participants responding to the question (46.3%, $f = 25$) stated that their youth participated in 4-H followed by 20 participants who indicated their youth participated in boys and girls club. There were 19 participants who commented their youth participated in FFA. There were seven that indicated participation in Big Brothers/Sisters and six participants stating youth were involved in a Tribal Youth Program followed by four comments indicating participating in a UNITY youth council. Others participated in activities such as HOSA, Office of youth development, after school equine programs, 21st century, rodeo club, Diné youth club, rafting trips and substance abuse program for both youth. There were nine participants who stated that they attended weekend and holiday workshop training focused on livestock production. There were eight participants stated that there were no after school activities available for the youth in their area.

Realistically, can safety practices in your communities be improved or are things just the way they will always be?

Participants were asked if they felt that safety practices in their communities could be improved or if things are just the way they will always be. There were 51 participants who answered the question. Of those, 38 participants were confident that things could change and that there is plenty of room for improvement. One participant said, “Can be improved through providing information through modern technology. Offer kids farm/ranch safety as side classes at AG seminars geared to adults.” A very common concern among participants was the need to educate the youth about safety, through continuous reminders, classes, time and patients from leaders. There were nine participants felt that the way that their community is now is the way that it will always be. One participant said, “until more people get involved, and parents take interests in their children activities things will be the same.”

What are some barriers to using safety equipment such as riding helmets for equestrian activities?

Participants were asked what they felt were some barriers to using safety equipment such as riding helmets for equestrian activities. There were three common themes that arose from participants comments. The most common comment was related to social acceptance of using safety equipment. Of the 50 individuals who answered the question, 14 individuals commented that the biggest barrier was youth felt a sense of humiliation if they wore protective equipment. Additional comments indicated youth felt peer pressure not to wear protective gear while working with livestock or equipment. Another popular concern was the lack of funding or the ability for them to purchase the proper equipment for the youth. A participant commented that it was “too expensive for families so they do not stress the importance.” The third concern was the availability and

knowledge of how to properly use the safety equipment. Participants' comments indicated a felt need to be trained on how to effectively use safety equipment, how to properly fit it to the user, and how to find available equipment for them to use.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Study

The purpose of this study is to provide a formative needs assessment of Diné parents for the prevention of child injuries resulting from livestock including those that are horse related. This chapter summarizes the findings of the study. Specifically, the objectives of this study were to:

1. Describe the demographics of Diné parents and community stakeholders that farm or ranch.
2. Identify parents and community stakeholders perceived injury risk to Diné youth related to livestock and horse related agricultural practices.
3. Identify parents' perceived need for safety training to reduce livestock and horse related injury to Diné children.
4. Describe Diné parents input on the use of social media as a tool to educate parents about livestock safety.
5. Describe Diné community stakeholder input on reducing children's livestock and horse related injury through online prevention interventions.

Agriculture remains one of the most dangerous occupations in the United States and the need of education for youth about safety while working on the farm or ranch is necessary in order to reduce the number of accidents and deaths caused by farm related accidents.

The population of this study was a sample of participants (N = 96), where the researcher traveled to different events where farmers and ranchers who work with youth would be found, for example the Navajo state fair. Participants completed a researcher-developed questionnaire that consisted of 25 questions along with 10 open-ended questions. Demographic questions were asked, covering a range of topics, including the type of farm or ranch that best described their operation, makeup of farm or ranch, if they used the internet to access information for running their farm or ranch, how many people members in the household accessed the internet and how often they accessed it. Questions were asked about the perceived injury risk involved with youth working with livestock and farming equipment, and if they found a need of trainings for these topics. Participants were asked what social networks they utilized along with how often they utilized them. They were also asked what website components they felt would be useful for promoting livestock safety for the youth.

Conclusions

Family farming and ranching often involves children and youth working alongside family members (NCCRAHS, 2011). Children are allowed and often expected to assist with work tasks that may be unsuitable for their physical or mental abilities putting them at risk for injury or death (Sanderson, Dukeshire, Rangel, & Garbes, 2010). In 2006, youth living on livestock operations had a high injury rate of 11.9 injuries/1,000 youth (NCCRAHS, 2011). A startling statistic found by Fullerton et al. (1995) and Crandall et al. (1997) was that the farm-related injury death rate among adult American Indians was 51.2 per 100,000 people per year, which was twice the rate of Anglos and

Hispanics combined. This study indicated several areas where parents perceived an activity as a high risk and acknowledged a need for safety training. Based on this study, the following conclusions were generated:

Participants perceived a high risk for many tasks that youth perform on the farm or ranch.

Injuries that participants found common while working on the farm or ranch were sprains, back injuries, cuts, loss of extremities, and even death. The results indicated that 12 participants felt that broken bones were very common, 9 felt that head/brain trauma was a very high risk, 12 felt that getting kicked or stomped on by livestock is a risk that is involved in working with horses and livestock. Mayberry et al. (2007) stated that equestrian injuries are a common sight at trauma centers, where the severity of the injuries range from fractured extremities, soft tissue, intracranial, and internal injuries.

The highest perceived risk that was indicated by parents was youth working with stallions, bulls, and rams at 63.0%. When participants were asked if there were safety issues associated with having youth working on the farm or ranch a very large portion felt that the biggest issue was a lack of education and instruction from their elders.

Participants found a need for safety training through online resources.

Approximately 75% ($f = 38$) of the participants in this survey were confident that things could change, and that there is plenty of room for improvement. A concern among participants was the need to educate the youth about safety, through classes and technology. A high number of participants (60.4%) indicated that riding as an extra rider on a tractor was a high risk along with 41.3% of participants that indicated that driving a

tractor without roll over protection was a high risk. Three fourths (75.8%, $f = 69$) of the participants indicated a definite need for training for working safely with tractors. With such high percentages showing a need for tractor safety we acknowledge the need to focus on a tractor safety training program. We also acknowledge that the lack of knowledge of tractors could be due to the fact that they cannot financially afford them, therefore they do not know how to use a tractor.

There were 54 respondents that indicated that riding a green broke horse was a high risk, 59.3% also felt that when youth use unfitted or incorrect equipment it creates a high risk for the youth involved. Approximately 72% felt there was a definite need for a training program to promote working safely with horses. Approximately 70% of survey participants indicate a definite risk for youth working safely with livestock and feel there is a definite need for a training program.

Results indicated few programs in place for educating youth about horse and livestock safety with most active in 4-H or FFA. Online education sources may assist in overcoming the barrier of transportation and travel to traditional face-to-face activities. Approximately 78% of the participants indicated that online video-learning modules and quizzes would be extremely useful to somewhat useful. There were 66 participants (74.2%) that feel that the ability for visitors to see what new safety-related videos, news articles, etc. on a homepage blog roll would be extremely useful to somewhat useful. Approximately 90% felt that the ability to view upcoming events from both our projects and those submitted by our partners would be extremely useful to somewhat useful.

A definite need exists for safety equipment and training courses on how to effectively use safety equipment and how to properly fit it to the user.

Similar to the findings of Nelson et al. (1994) this needs assessment indicated that Diné youth do not view wearing equestrian helmets very positively. Survey participants indicated that youth view them as unnecessary and uncomfortable. There is frequently an image that those who wear helmets are not “true cowboys/ cowgirls.” This perception of equestrian helmets may be a difficult barrier to overcome. Fourteen participants felt that the biggest barrier was the perception of humiliation of the youth wearing protective gear, such as a helmet. Survey participants indicated youth may feel peer pressure not to wear protective gear while working with livestock or equipment. Another popular concern was the lack of funding or the ability for them to purchase the proper equipment for the youth, one participant stated that it was “too expensive for families- so they do not stress the importance.” The third concern was the availability and knowledge of how to properly use it. They felt that there needed to be training courses on how to effectively use safety equipment and how to properly fit it to the user, and how to find available equipment for them to use. Social marketing may provide a method of gaining social acceptance of personal protective equipment provide adequate funding and resources are allocated to meet this perception challenge. A potential avenue to gaining acceptance of using personal protective equipment would be to involve respected or esteemed individuals by Diné youth. An example would be rodeo athletes. The use of helmets is also becoming more common in the rodeo arena, where “saddle bronc” or “bare back” riders and bull riders are acknowledging the benefits of wearing a helmet.

Recommendations for Practice

Provide access to youth programs that will help develop horse and livestock safety practices.

Members of the Diné population should utilize local resources, such as extension and knowledge from community members, to build programs that would teach the youth how to perform tasks around the farm or ranch safely. Working with extension will provide the opportunity to use all of the resources built by other extension programs, whether videos, on-line discussion boards, or even physical contacts from other counties. This will allow for a more diverse program.

Use social media and internet resources to assist community members in promoting agricultural safety practice for youth.

Utilization of Facebook and other online social networks, online-videos, and internet access/usage should produce positive results for training Diné youth and parents. It will eliminate extensive traveling to events and allow youth who otherwise would not be able to travel to classes or seminars, to participate in classes and be involved in a program that will increase their knowledge of livestock safety. It will also allow for them to relate to other youth who are in their same situations that may live miles and miles away. Broadcasting information over the internet will allow for youth to gain more knowledge from a variety of sources. They would not be limited to the knowledge of members of their community, rather they would be able to hear from educators from all areas.

Develop a user-friendly network for parents and leaders to access resources to assist in the education of the youth in local agricultural traditions integrated with safety training.

Due to the limited amount of resources, a common network of materials and equipment may benefit the Diné population. Due to the lack of funding, the ability for each community to purchase all of the necessary equipment would be nearly impossible. If there was a way for communities to share equipment it would be more financially feasible while they would be able to collectively gather more equipment. Possible collaborations with Indian Health Services, Navajo Agricultural Products Industry, and Navajo Nation Traditional Agricultural Outreach could provide resources to acquire agricultural safety equipment and training for Diné communities.

Recommendations for Future Research

In continuing this project, future research should be conducted to estimate the effectiveness of agricultural safety and health training among Diné youth and parents. This project has provided baseline data in understanding risk perceptions and training needs of Dine farmers and ranchers. Research will be needed to evaluate knowledge and behavior changes resulting from the implementation of a safety training program. Additional research should be conducted to assess program participants' value of such a program upon implementation and future trends in safety training needs.

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APPENDICES

APPENDIX A

Internet Access Survey

Farm and Ranch Safety for Youth and Internet Access Survey

Directions: Please respond to the following questions. The survey should only take 10-15 minutes to complete. As a token of appreciation for completing the survey we would like to offer you a Utah State University Athletic hat. Please be honest in your response. All responses will be kept confidential. Once completed please fold in half and return to the interview host.

1. During 2011, which of the following best describes your farm or ranching operation? Check only one.

<input type="checkbox"/> Family farm	<input type="checkbox"/> Farm in corporation
<input type="checkbox"/> Farm in partnership	<input type="checkbox"/> Hobby farm

2. Of the total acres you operated in 2011, how many were used for the following purposes? Check all that apply. Please estimate the number of acres you operated for each category.

<input type="checkbox"/> Acres of cropland _____
<input type="checkbox"/> Acres of pastureland _____
<input type="checkbox"/> Acres of rangeland _____

3. How do you access the internet? Check all that apply.

<input type="checkbox"/> Personal mobile device (i.e. Smartphone)	<input type="checkbox"/> Work/business laptop
<input type="checkbox"/> Personal laptop	<input type="checkbox"/> Work/business tablet (i.e iPad)
<input type="checkbox"/> Personal Tablet (i.e iPad)	<input type="checkbox"/> Work/business desktop
<input type="checkbox"/> Personal desktop	<input type="checkbox"/> Community/ library computer
<input type="checkbox"/> Work/business mobile device (i.e. Smartphone)	<input type="checkbox"/> Don't have access to computer/ mobile device

4. How many members of your household, including yourself, use the internet for non-business purposes? Check only one.

<input type="checkbox"/> 1	<input type="checkbox"/> 4
<input type="checkbox"/> 2	<input type="checkbox"/> 5
<input type="checkbox"/> 3	<input type="checkbox"/> More than 5

5. Do you currently use the Internet to obtain information for running your farm or ranch? Check only one.

<input type="checkbox"/> Yes (if so please provide a description of the type of activity) _____
<input type="checkbox"/> No

6. How often do you go on the internet to obtain information?

<input type="checkbox"/> 1-3 times per week	<input type="checkbox"/> Once daily
<input type="checkbox"/> 4-7 times per week	<input type="checkbox"/> Multiple times a day

7. Which of the following types of activities do you perform over the Internet? Check all that apply.
- | | |
|---|--|
| <input type="checkbox"/> Obtain technical information on agriculture | <input type="checkbox"/> Obtain information on agricultural policy |
| <input type="checkbox"/> Obtain pricing information for agriculture inputs | <input type="checkbox"/> Obtain information from chat rooms |
| <input type="checkbox"/> Obtain information about agriculture commodity markets | <input type="checkbox"/> Read blog entries |
| <input type="checkbox"/> Obtain financial information | <input type="checkbox"/> Read Navajo Nation News |
| <input type="checkbox"/> Obtain weather information | <input type="checkbox"/> Read your Chapter's News |
| | <input type="checkbox"/> Personal communications through e-mail |
| | <input type="checkbox"/> Entertainment (games, videos etc.) |
8. Which search strategy do you use to find information over the internet? Check only one.
- | | |
|--|--|
| <input type="checkbox"/> Keywords using Google | <input type="checkbox"/> Keywords using Ask.com (Ask Jeeves) |
| <input type="checkbox"/> Keywords using Yahoo | <input type="checkbox"/> Other (Please Specify) |
| <input type="checkbox"/> Keywords using Bing | |
9. Please indicate how much you agree that you would utilize an interactive internet resource to promote agricultural health and safety for Diné youth? Check only one.
- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree
10. Do you utilize online social networks? Check all that you have an account for.
- | | |
|-----------------------------------|---|
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Ning |
| <input type="checkbox"/> Twitter | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> LinkedIn | |
| <input type="checkbox"/> MySpace | |
11. Please indicate how much you agree that you would utilize Internet social networks (i.e. Facebook) to promote agricultural health and safety for Diné youth? Check only one.
- Strongly agree
- Agree
- Undecided
- Disagree
- Strongly disagree
12. How often do you use online social networks? Check one.
- | | |
|---|---|
| <input type="checkbox"/> 1-3 times per week | <input type="checkbox"/> Once daily |
| <input type="checkbox"/> 4-7 times per week | <input type="checkbox"/> Multiple times a day |
13. How much formal computer-related education do you possess? Check only one.
- | | |
|--|---|
| <input type="checkbox"/> None | <input type="checkbox"/> Instruction from friends or family |
| <input type="checkbox"/> High school courses | <input type="checkbox"/> Instruction available in software programs |
| <input type="checkbox"/> College computer courses | |
| <input type="checkbox"/> Online instruction or courses | |

14. Do you work off the farm more than 200 days during 2011? For example a day working off the farm would be defined as an 8 hour work day involving non-farming or ranching employment.
- Yes
 No
15. How many workers under the age of 16, including family members, assisted you with work tasks on your farm in 2011? Check only one.
- None 3-4
 1-2 5 and above
16. In 2011, what was your total gross farm income? (Gross farm income is your total farm income before subtracting expenses.) Check only one.
- | | |
|---|---|
| <input type="checkbox"/> \$2,499 or less | <input type="checkbox"/> \$50,000 to \$99,999 |
| <input type="checkbox"/> \$2,500 to \$4,999 | <input type="checkbox"/> \$100,000 to \$249,999 |
| <input type="checkbox"/> \$5,000 to \$9,999 | <input type="checkbox"/> \$250,000 to \$499,999 |
| <input type="checkbox"/> \$10,000 to \$24,999 | <input type="checkbox"/> \$500,000 to \$999,999 |
| <input type="checkbox"/> \$25,000 to \$49,999 | <input type="checkbox"/> \$1,000,000 or more |
17. In 2011, what was your net farm income? (Net income is gross farm income minus expenses.)
Check One.
- Costs exceeded income in 2011
 Broke even
 \$4,999 or less
 \$5,000 to \$19,999
 \$20,000 to \$49,999
 \$50,000 to \$99,999
 \$100,000 to \$249,999
 \$250,000 or more

18. Please rate the usefulness of the following interactive website components to promote the safety of Diné youth working on farms and ranches.

Website Component	Usefulness				
<p>Online video-learning modules and quizzes: To assist users in obtaining information related specifically to safety techniques for livestock production on the Navajo Nation, videos about agricultural safety and quizzes accessible on the website.</p>	Extremely Useful <input type="checkbox"/>	Somewhat Useful <input type="checkbox"/>	Undecided <input type="checkbox"/>	Somewhat Not Useful <input type="checkbox"/>	Not Useful at all <input type="checkbox"/>
<p>Homepage Blog Roll: To allow visitors to see what new safety-related videos, news articles, testimonials and calendar events are posted online; a regularly-updated flow of information will be posted to the homepage.</p>	Extremely Useful <input type="checkbox"/>	Somewhat Useful <input type="checkbox"/>	Undecided <input type="checkbox"/>	Somewhat Not Useful <input type="checkbox"/>	Not Useful at all <input type="checkbox"/>
<p>Related Links Section: A tab for related information will be included to encourage users to visit other agricultural safety websites and social media including: North American Guidelines for Children's Agricultural Tasks (www.nagcat.org) and Childhood Agricultural Safety Network (www.childagsafety.org).</p>	Extremely Useful <input type="checkbox"/>	Somewhat Useful <input type="checkbox"/>	Undecided <input type="checkbox"/>	Somewhat Not Useful <input type="checkbox"/>	Not Useful at all <input type="checkbox"/>
<p>Feedback Link: This will be utilized to obtain information that will help us better serve the Diné population while also gathering demographical information.</p>	Extremely Useful <input type="checkbox"/>	Somewhat Useful <input type="checkbox"/>	Undecided <input type="checkbox"/>	Somewhat Not useful <input type="checkbox"/>	Not Useful at all <input type="checkbox"/>
<p>Enabled Comments: Comments will be enabled for all features of the website, so that an interactive, community atmosphere is formed through discussion.</p>	Extremely Useful <input type="checkbox"/>	Somewhat Useful <input type="checkbox"/>	Undecided <input type="checkbox"/>	Somewhat Not Useful <input type="checkbox"/>	Not Useful at all <input type="checkbox"/>
<p>Calendar: This will allow visitors to view upcoming events from both our projects and those submitted to us by our partners.</p>	Extremely Useful <input type="checkbox"/>	Somewhat Useful <input type="checkbox"/>	Undecided <input type="checkbox"/>	Somewhat Not Useful <input type="checkbox"/>	Not Useful at all <input type="checkbox"/>

19. For each of the following tasks please indicate your perception of the level of risk that a Youth or Child could be **injured** while performing that task.

Task	High Risk	Moderate Risk	Low Risk	Not a Risk
Using a horse while herding/ checking livestock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working with stallions, bulls, and rams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working around female livestock with young	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleaning stalls/pens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeding livestock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding as an extra rider on a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding a horse without an equestrian riding helmet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leading a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jumping a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competing in equine speed events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competing in equine trail courses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mounting and dismounting a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cleaning hooves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grooming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working cattle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trail riding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding alongside a road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding in a parade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding young/ green broke horses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding a horse that belongs to someone else	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Catching a horse in a pen with other horses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roping horseback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dragging something while horseback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using unfitted or incorrect equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Leading horses while horseback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Approaching a horse that is tied or staked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tying a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saddling a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hobbling a horse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Repairing fence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loading hay on trailers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unloading hay and stacking on hay stacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using a tractor without roll over protection structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding ATV without an approved safety helmet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riding as an extra rider on a tractor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. Please indicate your need for each of the following safety training topics for youth working on livestock and horse related issues.

NEED	Definitely yes	Probably yes	Probably not	Definitely not
Use of respiratory protection equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working safely with livestock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working safely with horses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working safely with tractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preventing stress and strains while lifting or bending	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using ATV's safely while working livestock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Please indicate your need for safety training for youth working on the farm/ranch:

NEED	Definitely yes	Probably yes	Probably not	Definitely not
Safety training for youth working with equine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety training for youth working with tractors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety training for youth working in serious weather conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety training for youth irrigating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. What is your gender?

- Male
 Female

23. What is your age in years? _____

24. What is the highest level of education that you have received? _____

25. What makes up the majority of your farm or ranch production?

- Sheep/Goats
 Beef Cattle
 Horses
 Swine
 Poultry
 Vegetables
 Fruit
 Row Crops (corn, soybean, wheat)
 Forage (Alfalfa)

Thank you for responding.

Your help is very much appreciated. As a token of appreciation we would like to offer you a Utah State University Athletic hat for participating in this survey. Please fold in half and return to interview host.

APENDIX B

Interview Questions

INTERVIEW QUESTIONS

Expected Outcome: To understand agriculture safety issues facing Diné youth and their outlook on life, the world, the potential problems they face, themselves and their community.

Questions:

What is it like to be a Diné youth engaged in today's livestock and equine industry?

When you think about their (Diné youth) future, what do you see them (Diné youth) doing?

Are there safety issues associated with having youth working on the farm/ranch? What are those issues?

Are you aware of specific injuries to youth working with livestock and horses? What are those injuries?

What are positive activities you are involved with in your community to prevent injuries to youth working livestock and horses?

What do you see as the biggest challenge facing youth in your community?

What can parents do to make working with livestock and horses safer for youth?

What kinds of opportunities for constructive after-school activities are available in your community? (UNITY youth council, Boys & Girls Clubs, Tribal Youth Program, Big Brothers/Big Sisters 4-H, FFA, HOSA, or Upward Bound).

Realistically, can safety practices in your communities be improved or are things just the way they will always be?

What are some barriers to using safety equipment such as riding helmets for equestrian activities?