

ABSTRACT

BECK, COURTNEY HATHAWAY. Ground Safety Skills Among North Carolina 4-H Horse Program Participants. (Under the direction of John S. Rayfield.)

Horses play a large role in the economic and recreational lives of many Americans. However, there are inherent risks associated with horse activities. According to the Children's Safety Network (2005), one in three equestrian-related injuries occur while dismounted. Despite this risk, the topic of horse ground safety has been neglected in both extension and agricultural education research.

The objectives of this study were to benchmark the current level of horse ground safety skills among participants in the North Carolina 4-H Horse Program and to determine if background factors affected safety skills. By understanding more about the current level of horse ground safety, programming can be developed to address the weaknesses and increase the safety of this sport.

The sample for this study (N=63) was drawn from attendants of the 2007 North Carolina 4-H Horsemanship Camp, held in June. Participating campers completed the researcher-developed questionnaire which consisted of 21 questions. The purpose of this form was to collect information about the campers' horse and 4-H background. Immediately following completion of the demographic form, the campers completed a skills test. The skills test was broken into three sections (stall safety, leading safety, and grooming safety), and each section was scored by trained horse industry specialists.

The stall skills section had the highest mean score, followed by the grooming skills section then the leading skills section. Scores in all three sections were found to be less than acceptable. Of the background factors investigated, three were found to lead to

significant differences in safety scores: owning a horse, ever taken riding lessons, and currently taking lessons.

The background factors investigated that did not lead to higher safety scores were riding discipline and participation in 4-H Horse Program activities other than 4-H Horsemanship Camp.

The researcher concluded that campers who participated in this study received safety scores that were lower than desirable, and that owning horses or taking riding positively influenced ground safety scores. The researcher proposed the following recommendations: young equestrians need formal instruction on ground safety, emphasize the educational benefits of participation in 4-H horse shows events as they relate to ground safety, evaluate youth horse programming to ensure it is meeting their educational needs and learning capabilities, and parents would benefit from ground safety training.

Ground Safety Skills Among North Carolina 4-H Horse Program Participants

by
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BIOGRAPHY

A North Carolina native, Courtney Hathaway Beck grew up in Johnston County where she was an active 4-H member and an avid equestrian. In 2002, Beck graduated from the University of North Carolina at Chapel Hill with a Bachelor's of Arts in Journalism and Mass Communication. While in college, she worked for The Daily Tar Heel and completed internships with The Jimmy V Celebrity Golf Classic and French West Vaughan, a Raleigh-based public relations company. Beck went on to work as a public relations account executive for Raleigh agency Gibbs & Soell and an assistant trainer for Sandy Arledge Quarter Horses before returning to school fulltime. While in school, she started Purple Pony Communications, a public relations and marketing consulting firm. Additionally, she worked as a graduate research assistant and in contract positions with the Extension Horse Husbandry and the North Carolina Department of Agriculture and Consumer Services.

Beck's 4-H background and horse training experience prompted her to investigate horse ground safety in her Master's thesis. She presented her results at the American Association of Agricultural Educators Southern Region Conference and the American Youth Horse Council Annual Symposium, both held in 2008. Beck completed her Master's of Science in Extension Education from North Carolina State University in 2008. At the time of publication, she was self-employed as a consultant with Purple Pony Communications.

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CHAPTER 1

Introduction

Horses play a large role in the lives of many Americans as well as in the United States economy. According to the American Horse Council (Deloitte Consulting LLP, 2008), there are 9.2 million horses in the United States, primarily kept for recreation or showing. One out of every 63 Americans are involved in the horse industry as owners, service providers, employees or volunteers. The horse industry has a direct annual economic impact on the United States of \$39 billion (Deloitte Consulting LLP, 2005). Approximately 258,434 and 13,000 youth respectively are involved in 4-H horse and Pony Club programs (Children's Safety Network Rural Center, 1997). In 2003, the most recent year for which data are available, 411,202 youths were enrolled in the 4-H horse program (National 4-H Headquarters, 2003).

Horseback riding is an inherently dangerous sport. Forty-four states have equine limited liability statutes (Greene & Trott, 2004). Youths under 15 years represent one in five equestrian-related hospital emergency department visits in the United States, and one in three equestrian-related injuries occur while the person is dismounted (Children's Safety Network, 2005). Holland, Roy, Goh, Ross, Keneally, and Cass (2001) noted that "the physical differences between horses and children predispose towards severe injury and are compounded by the potential for unpredictable behavior in both species" (para. 2). They go on to estimate that the risk of injury while horse riding has been estimated at 1 per 320 to 1 per 1000 hours of riding. Holland et al. concluded that "the overall risk of

injury from horse-related activity has been determined to be greater than that of car racing or riding a motorcycle, and the rate of hospitalization from falls from a horse equivalent to that from playing rugby” (Discussion, para. 1).

Rationale

While riding accidents receive the majority of research attention, there is also a risk associated with being near a horse on the ground. The Children’s Safety Network (2005) reported that one in three equestrian-related injuries occur while dismounted during activities such as leading, grooming, or playing around a horse.

There are several unique factors associated with horse-related activities that explain the high risk factor possessed by both mounted and unmounted equestrians. A horse may weigh up to 1100 pounds and travel up to 40 miles per hour (Children’s Safety Network, 2005). Additionally, in horse activities, the horse and its handler or rider must work together, thus the horse can act independently or unpredictably (Thomas, Annest, Gilchrist, Bixby-Hammett, 2006).

One horse behavior that can result in ground injury is a kick. A horse is capable of delivering a kick with a force up to 1.8 times its body weight (Thomas et al., 2006). A Swiss study that analyzed horse-related emergency room visits found that 17 of the 80 injuries were caused by a direct kick to the mouth of an unmounted equestrian. The equestrians reported that they were standing either next to the horse or behind it, and two

were cleaning the horse's hooves. Eight patients sustained maxilla facial fractures or deep facial lacerations, five were referred to a plastic surgeon because of the complexity of the facial soft tissue wounds, and three underwent maxillofacial surgery. Additionally, contusions of the extremities, the back, and the trunk were reported, and one patient was immediately hospitalized. The authors noted that all of the patients were wearing helmets which protected the cranium. However, facial injuries occurred in 53% of all kicked patients. The authors went on to say that "direct trauma to the face is mainly associated with handling and not riding the horse. The risk of serious injury seems to be a function of cumulative exposure to horses, not level of expertise as is assumed by the majority of riders" (Exadaktylos, Egli, Inden, and Zimmerman, 2002, p. 574).

Another study that sought to analyze trends among horse-related injuries identified similar findings. In this study, 17% of the injured were unmounted. Of the 32 unmounted riders, 82% were kicked or stepped on and 10% were bitten (Chitnavis, Gibbons, Hirigoyen, Lloyd, and Simpson, 1996).

A study conducted by Thomas et al. (2006) found that from each year from 2001 to 2003, approximately 102,904 people were treated in American emergency rooms for horse-related injuries. Of those, 30,288 or 29.43% were unmounted. The following table shows the mechanism of injury.

Table 1.1

National Estimates of Non-fatal Horse-related Injuries Treated in Emergency Departments

Mechanism of Injury	Annual estimates	%
Fall	1,200	4.0
Struck by or against	17,155	56.6
Crush	7,740	25.6
Overexertion	2,330	7.7
Bite	1,779	5.9
Other/unknown	84	0.3

Thomas, Annest, Gilchrist, Bixby-Hammett, 2006, p. 621.

Related Research

Participation in 4-H livestock programs should be encouraged, as there are many benefits for youth to glean from the experience. A Texas A&M University study showed that according to parents, participation in a 4-H livestock project aided in life skill development. Parents reported that participation was either moderately or highly influential in helping their children build the following skills: accepting responsibility, setting goals, developing self-discipline, self-motivation, increasing knowledge of livestock industry, building positive self-esteem, decision making, developing organizational skills, developing oral communication skills, relating to others, problem solving, developing and maintaining records, working in teams and overall life skills. This study also indicated a low to moderate positive relationship between years of participation and life skill development, suggesting that the longer children actively engage in a 4-H livestock project, the more likely they are to develop the above life skills (Boleman, Cummings & Briers, 2004).

Despite the positive ramifications of participating in a 4-H livestock project, working with animals is inherently dangerous. According to Joerger and Ferguson (2000), an estimated 27,000 children under the age of 20 years who live on farms and ranches are injured in farm accidents each year. This figure does not include children who visit or work on non-family farms. Additionally, the total injury toll has been estimated at greater than 100,000 annually. Minnesota and Indiana studies indicate that 24% and 14%, respectively, of total farm injuries were sustained by children aged 15 years and younger (Joerger & Ferguson, 2000).

Many of these farm injuries can be attributed to livestock. One hospital study that spanned more than six years reported that animals were involved in 40% of injuries involving children. Of these injuries, 32% involved horses. Another study of emergency room logs found that livestock accounted for 56.8% of injuries treated in rural Utah emergency rooms. Of all agriculturally-related injuries treated in rural hospital emergency rooms, children aged 16 years and younger accounted for 29.8%. Additionally, children aged 16 years and younger experience 28.2% of all livestock injuries (Joerger & Ferguson, 2000).

It is important to reiterate that these statistics only reflect the number of injuries that occur on a farm; they do not account for children who visit non-family farms or other horse establishments such as boarding stables. Arnold, Jepsen and Hedrick (2006) note that:

As our society and technology change, the number of families that live on farms today is decreasing... However, this trend has not eliminated the incidence of farm-related injuries occurring to children. Even though many of today's children do not live on farms, most will have the opportunity to visit a friend's or relative's working farm sometime in their young life and are often times unaware of the safety precautions that need to be exercised there. It is imperative that youth be made aware of the unique dangers present on the farm (Background section, 1).

In the United States, the Children's Safety Network (2005) estimated that 23,000 youth under 20 years were treated from equestrian-related injuries in an emergency department annually. From 1999-2002, 76 youth under 20 years suffered fatal injuries while riding an animal or in an animal-drawn vehicle, and head injury was the most frequent cause of death. The highest risk group is females aged 10-19 years, as they comprise 57% of the hospital emergency department visits. The majority of incidents (36%) occurred at home, but injuries also occurred at recreational areas, farms and schools. A population-based report from rural Wisconsin indicated that youth are at greater risk than adults; the equestrian-related injury rate for youth under 16 years is 5.6 injuries per 10,000 person-years, compared to 3.9 per 10,000 for adults.

Eight factors associated with equestrian-related injuries were identified by the Children's Safety Network Rural Center (1997): female gender; 10-19 years of age; no helmet use; immature judgment; risk taking, motor skills, or technique; more experienced

riders (5+ years); riding English style; riding 15-24 hours per month; horse being “spooked” by people, noises or traffic.

In North Carolina, there have been 95 horse-related deaths from 1981-2005. Youths age 14 and under account for 11.8% of the 17 deaths that occurred from 2001-2005, and 35.7% of all horse-related deaths from 1981-2005 occurred at home. Though white equestrians comprised the majority of the deaths, all races were represented in the death toll. Additionally, this study points out that 75.7% of the deceased were mounted and 66.3% fell from the horse; this indicates that dismounted equestrians also accounted for 24.3% of the deaths (Hammett, 2007).

Numerous studies have been conducted to quantify the risks associated with horse activities. An Australian study that investigated equine-related emergency room visits revealed some disturbing trends (Holland et al., 2001). The study examined data from two separate emergency room logs. Of children admitted with play and sporting injuries, 6% and 8% of those were horse-related; additionally, horse-related injuries comprised 35% and 48% of all animal-related traumas. The study noted that “none of the children were wearing a helmet at the time of the injury, even when involved in activities requiring close proximity to the horse” (Discussion, para. 3). The study went on to point out that:

Although the risk of injury in children involved in horse-related activities is high, of perhaps more importance is the severity of such injuries and their potential

long-term impacts. In addition to the six deaths over 12 years in New South Wales, 230 children had sufficiently severe injuries to require hospital admission. While a kick from a horse may cause a lower-limb fracture or soft-tissue injury in an adult, in a child it may result in a compound skull fracture, thoracic trauma or perforated hollow viscus. Our findings indicate that the social and economic cost of horse-related trauma in children is considerable: a death every two years in New South Wales, over 200 children admitted with an average length of stay of three days, and 10% of survivors having complications (Holland et al., 2001, Discussion, para 5).

There is a high monetary cost associated with youth horse injuries. The Children's Safety Network Rural Center estimated that the cost for horse-related injuries among children and adults younger than 25 years seen in hospital emergency departments in 1996 was \$88 billion. The Children's Safety Network Rural Center (1997) estimated the cost per injury to be \$7,441.

Though some horse accidents are, by their nature, unavoidable, many accidents could be avoided if proper precautions were taken. Greene and Trott (2004) claimed that "accidents happen when people make false assumptions about the risks involved in working with and around horses" (Faulty Assumptions, 1). They go on to list several faulty assumptions equestrians make, including "others that are not careful have accidents... not me" and "my school horses are 'bomb-proof' and very dependable."

Additionally, riders often develop an “it could never happen to me” mentality.

“Sometimes, if people have not experienced an accident, they cannot conceive either the possibility or the potential devastation associated with a serious injury or death” (Greene & Trott, 2004, *Faulty Assumptions*, 4). Despite mounting evidence touting the necessity to wear a riding helmet, a survey administered to Indiana 4-H Horsemanship Camp attendees by the Department of Youth Development and Agricultural Education at Purdue University concluded that only 49.6% of the youth believed that a helmet made them safer when mounted (McKee & Brady, 2004). According to Greene and Trott (2004), it is only logical to assume the negative attitudes and assumptions mentioned above will be passed along to the next generation of equestrians.

Theoretical Framework

Experiential education is largely employed by 4-H. The Association for Experiential Education (2008) defines the term as “a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values.”

One of the early proponents of experiential education was John Dewey. Dewey did not care for typical learning tactics such as rote memorization of facts and formulas; instead, he felt it was important to take advantage of a child’s natural curiosity by tying learning in with a student’s interests and experiences. Dewey (1938) wrote:

The traditional scheme (of education) is, in essence, one of imposition from above and from outside. It imposes adult standards, subject-matter, and methods upon those who are only growing slowly towards maturity. The gap is so great that the required subject-matter, the methods of learning and of behaving are foreign to the existing capacities of the young. They are beyond the reach of the experience the young learners already possess (p. 4).

Another noted name in experiential learning is David Kolb. In conjunction with Roger Fry, Kolb created his model (Figure 1.1) out of four elements: concrete experience, observation and reflection, the formation of abstract concepts, and testing in new situations (Smith, 2001).

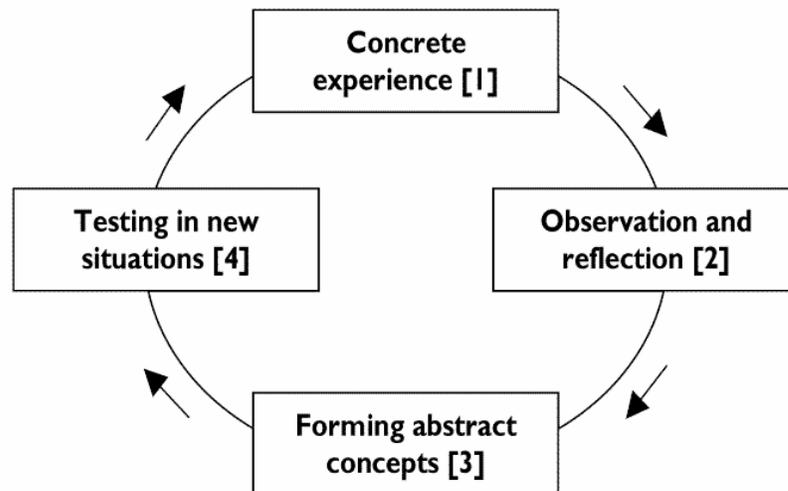


Figure 1.1: Kolb's Experiential Learning Cycle (Smith, 2001)

Though Kolb and Fry argued that the learning cycle can begin at any of the four points, they suggested that the learning process ideally begins when a person performs an

action and then sees its repercussions. The next step was to understand these repercussions in that particular instance, so that if the person later found himself in a similar situation, he or she could anticipate what would happen if he or she replicates the action. The third step would be to understand the general principle under which the particular instance falls. Kolb and Fry maintained that the learning process should be approached as a continuous cycle (Smith, 2001).

4-H embraces experiential education, as evidenced by its “learn by doing” motto. “Learn by doing” has been the cornerstone of the 4-H educational process since its inception; more recently, however, 4-H adopted an official model to depict the process, the National 4-H Experiential Learning Model (Figure 1.2) (Diem, 2001).

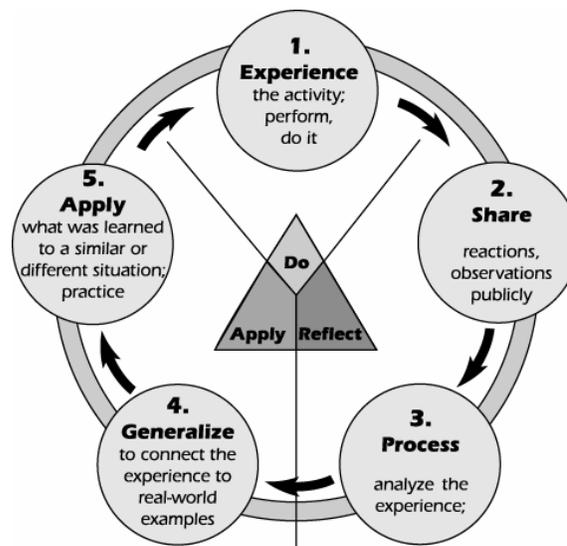


Figure 1.2: The National 4-H Experiential Learning Model (Diem, 2001)

In the first step of the National 4-H Experiential Learning Model, youth do an activity rather than listening to an explanation; additionally, except for basic instructions

such as safety, youth should do the activity before being told or shown how. Steps two and three provide an opportunity for youth to reflect and practice acceptance by developing their own logical thoughts while listening to the experiences or opinions of others. In these steps, youth describe the results of the experience as well as their reactions to it then process the experience by relating the results to the learning objectives. The final two steps help youth apply what they have learned, enabling them to generalize their new knowledge to other situations. Youth generalize to connect their discussions to the world around them. Finally, youth use their new skills in other parts of their lives. Despite the emphasis on individual experience, it is crucial that a trained adult leader be on hand to facilitate (Diem, 2001).

Although 4-H acknowledged several drawbacks to experiential learning, including the time required to develop and implement an experiential learning activity, the National 4-H Curriculum identifies several advantages to experiential learning, including giving youth a greater stake in the outcome because they are actively engaged in learning (Maxa et al., 2007). According to Boyd, Herring, and Briers (1992), John Dewey said experiential education is the most effective means for teaching youth practical knowledge.

This study embraces the National 4-H Experiential Learning Model. Study participants were asked to perform common tasks associated with handling a horse on the

ground. After completing the tasks, participants were informed of the purpose of the study and received instruction in safe horse handling practices.

Objectives

The purpose of this study was to determine the current level of horse ground safety skills among participants in the North Carolina 4-H horse program. Specifically, the objectives of this study were to:

1. Develop a benchmark of current ground safety skills among North Carolina 4-H Horse Camp participants in the areas of leading, stall, and grooming.
2. Describe the differences in ground safety skills based upon the demographic factors of riding discipline, horse ownership, ever taken riding lessons, currently taking riding lessons, and participation in 4-H Horse Program activities.

Assumptions

Campers who attend the N.C. Horsemanship Camp bring their own horse and are required to perform daily tasks associated with horse care, including feeding, grooming and stall cleaning. Though adult assistance is available, campers are expected to work independently for much of the time. Additionally, the camper's club leader and county agent must sign the application to certify that the camper is capable of participating in the planned activities. Thus, it was assumed that the campers who participated in this study interacted with horses regularly and were capable of performing the tasks.

Limitations

All judges underwent a training prior to the study. Despite this, a comparison of judge's scores revealed interrater reliability on the grooming portion to be $r = -.285$ and on the stall portion to be $r = .247$. Interrater reliability was calculated to be $r = .821$ for the leading portion.

Another limitation was that no follow-up was conducted for non-respondents. Eighty campers attended the 2007 session and 63 returned the parental consent forms for a response rate of 79%. Follow-up for non-respondents was not conducted because their parents chose for them not to participate in the study.

Definition of Terms

The following terms were used throughout this study:

4-H – “the Cooperative State Research, Education, and Extension Service (CSREES) flagship youth development program. Youth are encouraged to participate in a variety of activities that emphasize the ‘learning by doing’ experiential learning approach. Through these programs, youth gain knowledge in a variety of areas and develop important life skills” (USDA CREES, 2008, Overview section, para.4).

Cooperative Extension Service – “Through educational programs, publications, and events, Cooperative Extension field faculty deliver unbiased, research-based information to citizens” (NCCES, 2008, para. 2).

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.

4-H Horsemanship Camp – An annual activity of the North Carolina 4-H Horse Program in which 4-H members attend a week-long camp with their horses and increase their horse knowledge and skills through riding instruction and demonstrations.

Experiential Education – a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values.

Games – For the focus of this study, a riding discipline that focuses on speed events, such as barrel racing and pole bending.

Hippology – An equine knowledge contest that is used in 4-H, FFA and many horse breed contests. Hippology consists of four phases: horse judging, written examination and slide identification, ID stations and team problem solving.

Hunt seat – A riding discipline based on the tradition of fox hunting; emphasizes a forward style of riding and is often associated with jumping.

REINS (Regional Equine Information Network System) – A volunteer-based organization dedicated to distributing information to the North Carolina equine industry.

Riding Discipline – A style of horseback riding (hunt seat, western, saddle seat, games, etc.).

Riding Lesson – Formal instructional time with a qualified instructor.

Saddle seat – A riding discipline within the category of English riding that is designed to show off the high trotting action of certain horse breeds.

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

Summary

The review of literature provided evidence that 4-H Horse Programs, a popular choice for youth, can have a positive impact on youth by aiding in the development of essential life skills. However, the literature also confirmed that horse activities can be very dangerous and are often the cause of injuries or death. Though the literature confirmed that the majority of horse-related injuries and deaths are the result of riding accidents, it is estimated that one in three equestrian-related injuries occur while dismounted (Children's Safety Network, 2005). Kicking, biting and charging are common causes of horse ground-related injuries.

CHAPTER 2

Methodology

Population and Sample

The data for this study were obtained from participants of the 2007 North Carolina 4-H Horsemanship Camp. 4-H Horsemanship Camp is an annual activity of the North Carolina 4-H Horse Program. The camp has a capacity for up to 100 4-Hers. Each camper brings a horse and increases horse knowledge and skills through daily riding lessons, demonstrations and other horse activities. Campers were expected to have the ability to independently care for their horses throughout the week, as certified by both their club leaders and county agents on the camp application. Campers of all riding disciplines are accepted. Parental consent forms were mailed out with the camp information packets in early June. Eighty campers attended the 2007 session and 63 returned the parental consent forms for a response rate of 79%. Participating campers completed demographic forms and a skills test. The skills test was designed to measure the 4-Hers' horse ground safety skills. The demographic forms and skills test were completed on the first full day of camp during the morning demonstration period.

Design of Study

This descriptive study utilized survey research methods. The purposive sample consisted of 4-H members who met the following criteria: attended the 2007 N.C. 4-H

Horsemanship Camp and received parental consent to participate in the study. The researcher, based on communication with N.C. Extension horse specialists, believed camp attendees would be representative of participants in the N.C. 4-H Horse Program (Fraenkel & Wallen, 2006, p. 100).

Data and Instrumentation

The instruments were created by the researcher and peer reviewed by stakeholders in the North Carolina horse industry and university faculty for face and content validity. The researcher was present during the administration of all tests and oversaw their completion.

Participating campers completed demographic information then completed a skills test which consisted of various tasks associated with working with a horse on the ground. The demographic form consisted of 21 questions, and its purpose was to collect information about the campers' horse and 4-H background. Questions covered a range of topics, including whether the camper was currently taking or had ever taken riding lessons, years of 4-H and horse experience, and other 4-H activities in which the camper participated.

Immediately following completion of the demographic form, the campers completed a skills performance test. The skills test was broken into three sections: stall safety, leading and grooming. After receiving basic instructions, each camper completed the test individually. In the stall safety section, campers were asked to enter a stall, halter

a horse and tie it. In the leading section, campers were asked to lead a horse through a series of turns and stops. In the grooming section, campers were asked to briefly groom a horse, including its face, body, hooves and tail. One horse was used per section for the duration of that section, and horses were pre-screened by the researcher to ensure suitability and disposition. Campers awaiting their turn were kept in an area away from the testing area, thus limiting their ability to see the tasks before it was their turn. However, due to space and time limitations, the campers were often able to watch their contemporaries complete the skills test immediately preceding their own assessment.

During the skills test, each camper's performance was observed and scored by a panel of trained horse industry experts who were either REINS volunteers or riding instructors. There were two judges per section for a total of six judges. Several volunteer leaders were also on hand to instruct the campers prior to the tasks, ensure safety and otherwise facilitate the study. The judges were asked not to speak to the campers unless absolutely necessary and the volunteer leaders were instructed to provide instructions to the camper but not assistance. However, both judges and volunteer leaders were told to intervene immediately if a situation appeared dangerous or unsafe. This intervention would result in the camper receiving a 0 score for that particular skill; however, the camper would be allowed to continue the skills test.

Prior to the skills test, the judges underwent training and were given rubrics to guide their scoring. Due to time constraints, travel considerations, and the fact that

judges were selected from a pool of knowledgeable horse people, the training was held 30 minutes prior to the skills test. The purpose of the training was to discuss the rubrics and answer any questions the judges had. The rubrics were prepared by the researcher and peer reviewed by stakeholders in the North Carolina horse industry and university faculty for face validity. The rubrics outlined specific tasks that campers were to be judged on, as well as scoring guidelines. The researcher discussed the rubrics with the judges and answered their questions; this helped to calibrate the judges so they would be scoring on a comparable scale.

Each of the three sections of the skills test (stall safety, leading, and grooming) was broken into four maneuvers on the rubric. Campers were scored from 0-10 on each maneuver, with 0 being incomplete and 10 being perfect. Thus, each section was worth a possible 40 points, and the entire skills test was worth a possible 120 points. The camper's score for each section was determined by averaging the two judges' scores together; the averages from all three sections were added together for a final safety score. The rubrics also included space for comments, and the judges were encouraged to take notes. Judges' scores were correlated to insure interrater reliability. This was calculated to be $r = .821$ for the leading portion, $r = .247$ for the stall portion, and $r = -.285$ for the grooming portion.

Analysis of Data

All demographic forms and rubrics were examined by the researcher for completeness. Data were coded and entered into a Microsoft Excel spreadsheet. The data were then transferred into Statistical Package for Social Sciences (SPSS Version 15.0).

Descriptive statistics were used to calculate mean scores and standard deviations. Descriptive statistics were generated for gender, age, 4-H Horsemanship Camp attendance, 4-H Horse Program involvement, place of residence, race, and horse background. Mean scores were tabulated for leading, stall, grooming, and total safety scores. An analysis of variance (ANOVA) was used to determine the differences between mean total ground safety scores based on riding discipline. Independent samples *t*-tests were used to compare the differences in mean total ground safety scores based on horse ownership, riding lessons, and 4-H participation. This comparison of mean scores was used to detect differences among groups based on background factors.

CHAPTER 3

Results

Introduction

The purpose of this study was to determine the current level of horse ground safety skills among participants in the North Carolina 4-H horse program. N.C. 4-H Horsemanship campers (N=63) completed the researcher-developed questionnaire which consisted of 21 questions. The demographic questions covered a range of topics, including whether the camper was currently taking or had ever taken riding lessons, years of 4-H and horse experience, and other 4-H activities the camper participated in. The purpose of this form was to collect information about the campers' horse and 4-H background. Immediately following completion of the demographic form, the campers completed a skills test. The skills test was broken into three sections (stall safety, leading and grooming), and each section was scored on a scale of 0-40 by trained horse industry specialists.

Population Demographics

Frequencies were used to describe responses on categorical demographic variables. Females represented the majority, as 88.89% (n=56) of participants were female and only 11.11% (n=7) were male. Campers ranged in age from nine to 17, with higher concentrations (over 50%) in the 13-15 year range. Approximately half of

participants reported living in rural areas (on a farm or in a town under 10,000) while the other half reported living in urban areas (town of 10,000 to 50,000, or suburb, or city).

Table 3.1 shows gender, age, and residency categorical demographic responses.

Table 3.1

Frequencies for Gender, Age, and Place of Residence

Demographic	f	%
Gender		
Male	7	11.11
Female	56	88.88
Age		
9 years	5	7.94
10 years	7	11.10
11 years	5	7.94
12 years	6	9.52
13 years	11	17.46
14 years	8	12.70
15 years	13	20.63
16 years	3	4.76
17 years	1	1.59
No response	4	6.35

(table continues)

Table 3.1 (continued)

Demographic	f	%
Place of residence		
Farm	21	33.33
Town under 10,000 or rural non-farm	10	15.87
Town of 10,000-50,000	20	31.75
Suburb or city of 50,000 or more	6	9.52
Place of residence		
City over 50,000	3	4.76
No response	3	4.76

The primary riding disciplines represented were hunt seat (57.14%) and western (34.92%). The remaining responses of saddle seat or games (7.94%) were grouped into a category called other. In addition, the vast majority (87.30%) were horse owners. Approximately half of horse owners (49.12%) kept their horses at home. Table 3.2 shows the frequency of riding discipline, horse ownership, and horse stabling categorical demographic responses.

Table 3.2

Frequencies for Riding Discipline and Horse Ownership

Demographic	f	%
Riding discipline		
Western	22	34.92
Hunt seat	36	57.14
Other	5	7.94
Horse ownership		
Yes	55	87.30
No	6	9.52
No response	2	3.17
Where is your horse kept?		
Home	28	49.12
Boarding stable	21	36.84
Family member's farm	6	10.53
No response	2	3.17

When asked about their riding experience, almost half (47.62%) report that they have been riding horses for five to nine years. Approximately one third (31.75%) said they had been riding horses for one to four years, and the remaining 20.63% (n=13) said

they had been riding horses for more than 10 years. The vast majority (84.13% or n=53) have taken riding lessons from a professional instructor. Of those who reported taking riding lessons, about half are currently involved in a lesson program. Lesson frequency varied from more than once a week to monthly. Table 3.3 shows the frequency of riding experience, riding lessons, and riding lesson occurrence categorical demographic responses.

Table 3.3

<i>Frequencies for Riding Experience</i>		
Demographic	f	%
Years riding horses		
1-4 years	20	31.75
5-9 years	30	47.62
10+ years	13	20.63
Ever taken riding lessons?		
Yes	53	84.13
No	10	15.87
Currently take lessons?		
Yes	34	53.97
No	23	36.51
No response	6	9.52

(table continues)

Table 3.3 (continued)

Demographic	f	%
If currently taking lessons, how often?		
More than once a week	11	32.35
Weekly	19	55.88
Monthly	3	8.82
Did not respond	1	2.94

The majority of participants are relatively new to both the 4-H Horse Program and 4-H Horsemanship Camp. One third (31.75% or n=20) reported that this was their first year of involvement in the 4-H Horse Program, and 63.49% (n=40) were attending 4-H Horsemanship Camp for the first time. Years of 4-H Horse Program involvement ranged from one to 10, and the most common responses were one, two (14.29%, n= 9) or three (15.87%, n=10) years. Years of 4-H Horsemanship Camp attendance ranged from one to seven, and the most common responses again were one, two (20.63%, n=13) or three (12.70%, n=8) years. Table 3.4 shows the frequency of 4-H Horsemanship Camp attendance and 4-H Horse Program involvement.

Table 3.4

Frequencies for Camp Attendance and Program Involvement

Demographic	f	%
Years attended 4-H Horsemanship Camp		
1 st year	40	63.49
2 nd year	13	20.63
3 rd year	8	12.70
4 th year	1	1.59
7 th year	1	1.59
Years involved in 4-H Horse Program		
1 st year	20	31.75
2 nd year	9	14.29
3 rd year	10	15.87
4 th year	6	9.52
5 th year	6	9.52
6 th year	3	4.76
7 th year	2	3.17
9 th year	1	1.59
10 th year	2	3.17
No response	4	6.35

Parent involvement and active 4-H participation were trends among participants.

More than half (63.49%, n=40) said their parents are involved in their clubs either as a leader or a volunteer, and almost all (88.89%, n=56) participate in 4-H activities such as horse judging or creative expression contests. Of those who participate in other 4-H activities, approximately two-thirds (69.84%, n=44) compete in 4-H horse shows. Table 3.5 shows the frequency of parent, 4-H Horse Program activities, and 4-H horse show participation.

Table 3.5

<i>Frequencies for Parent Involvement, 4-H Activities, and Horse Show Participation</i>		
<i>Demographic</i>	<i>f</i>	<i>%</i>
Parents active in 4-H club		
Yes	40	63.49
No	19	30.16
No response	4	6.35
Do you participate in 4-H Horse Program activities?		
Yes	56	88.89
No	7	11.11
Do you compete in 4-H horse shows?		
Yes	44	69.84
No	19	30.16

Research Objective One

Research objective one was to develop a benchmark of current horse ground

safety ground skills possessed by North Carolina 4-H Horse Camp participants in the areas of leading, stall, and grooming. Means and standard deviations were used to describe results of the ground safety skills test, which were recorded in interval scale variables. Each section (leading safety, stall safety, and grooming safety) was broken into four skills. Each skill was worth 10 points, so participants could earn up to 40 points for each section and a possible total of 120 points for all three sections. Each section was scored by two judges. The average score of those two judges comprised the section score, and the average score of all six judges comprised the total score. The mean total score was 85.45 with a standard deviation of 14.14. The stall section had the highest mean score of 31.10, and the leading section had the lowest mean score of 23.46. The mean grooming score was 30.90. Table 3.6 shows the means and standard deviations for all sections of the skills test.

Table 3.6

Means and Standard Deviations for Ground Safety Scores

Test section	N	M	SD
Leading	63	23.46	8.18
Stall	63	31.10	5.66
Grooming	63	30.90	6.09
Total Ground Safety Score	63	85.45	14.14

Note. Mean score for each section is out of a possible 40. Mean total score is out of possible 120.

The safety section associated with leading posted the lowest mean score of 23.46 with a standard deviation of 8.18. Campers scored highest on skill 3 (stops quietly and backs correctly) with a mean score of 7.10 and lowest on skill 4 (demonstrates awareness of horse, environment and other people while standing skill). Relatively low mean scores were reported in skill 1 (correctly holds the lead rope in both hands) and skill 2 (maintains correct body position while leading horse at a walk). Scores in this section ranged from 6.00 to 40.00. Table 3.7 shows the means and standard deviations for all sections of the leading safety skills test.

Table 3.7

Means and Standard Deviations for Safety Scores in the Leading Section

Skill measured	N	M	SD
Skill 1: Correctly holds the lead rope in both hands	63	5.63	3.26
Skill 2: Maintains correct body position while leading horse at a walk (straight line and turning)	63	6.32	2.94
Skill 3: Stops quietly while maintaining correct body position; backs correctly	63	7.10	2.21
Skill 4: Demonstrates awareness of horse, environment and other people while standing still	62	4.48	2.48

Note. Campers were scored on a scale of 0-10 for each skill.

Of the three skills test sections, the mean score for the stall safety section was the highest. In this section, the mean score was 31.10 with a standard deviation of 5.66.

Campers scored highest on skills 2 and 3, which involved safely approaching and

haltering the horse. The mean score for skill 2 (quietly approaches horse's shoulder; if horse is not facing forward, moves horse prior to approaching) was 9.05, and the mean score for skill 3 (introduces halter and lead rope quietly; puts on halter correctly and efficiently) was 8.70. Campers scored lowest on skills 1 and 4. The mean score for skill 1 (checks position of horse prior to entering stall; enters stall safely; closes door behind) was 6.56, and the mean score for skill 4 (safely ties horse) was 6.90. Scores in this section ranged from 13.00 to 40.00. Table 3.8 shows the means and standard deviations for all sections of the stall safety skills test.

Table 3.8

Means and Standard Deviations for Safety Scores in the Stall Section

Skill measured	N	M	SD
Skill 1: Checks position of horse prior to entering stall; enters stall safely; closes door behind	63	6.56	3.89
Skill 2: Quietly approaches horse's shoulder; if horse is not facing forward, moves horse prior to approaching	63	9.05	1.02
Skill 3: Introduces halter and lead rope quietly; puts on halter correctly and efficiently	63	8.70	1.93
Skill 4: Safely ties horse	63	6.90	3.37

Note. Campers were scored on a scale of 0-10 for each skill.

The mean score of the grooming skills safety section was 30.90 with a standard deviation of 6.09. Though the stall section had a higher mean score, the score of this section was a very close second. Participants scored very consistently across all four grooming skills, with mean scores ranging from 7.10 to 8.73. Participants scored highest in skill 1 (works quietly and confidently around horse) with a mean score of 8.73 and lowest in skill 2 (picks up hooves safely) with a mean score of 7.10. Other mean scores were 7.41 in skill 3 (avoids remaining in the “danger zone” when walking around horse; correctly walks behind horse) and 7.76 in skill 4 (works around rear and tail safely). Scores in the grooming section ranged from 13.50 to 38.50. Table 3.9 shows the means and standard deviations for all sections of the grooming safety skills test.

Table 3.9

Means and Standard Deviations for Safety Scores in the Grooming Section

Skill measured	N	M	SD
Skill 1: Works quietly and confidently around horse	63	8.73	1.24
Skill 2: Picks up hooves safely	63	7.10	1.97
Skill 3: Avoids remaining in the “danger zone” when walking around horse; correctly walks behind horse	63	7.41	1.93
Skill 4: Works around rear and tail safely	63	7.76	2.32

Note. Campers were scored on a scale of 0-10 for each skill.

Research Objective Two

Research objective two was to describe the differences in ground safety skills based upon the demographic factors of riding discipline, horse ownership, ever taken riding lessons, currently taking riding lessons, and participation in the 4-H Horse Program.

The first background factor investigated was riding disciplines. The mean ground safety scores and standard deviations by riding discipline are shown in Table 3.10. An analysis of variance was used to examine differences between the groups based on riding scores. As shown in Table 3.11, differences were not statistically significant.

Table 3.10

Mean Safety Scores of Riding Discipline Groups

Skill section	Discipline	N	M	SD
Leading	Western	21	21.76	9.12
	Huntseat	36	23.50	7.58
	Other	6	29.17	6.52
Stall	Western	21	30.14	6.98
	Huntseat	36	31.61	5.08
	Other	6	31.33	3.92
Grooming	Western	21	29.17	7.81
	Huntseat	36	31.47	5.21
	Other	6	33.50	1.64
Total	Western	21	81.07	18.07
	Huntseat	36	86.58	11.39
	Other	6	94.00	9.37

Note: Of the 63 participants, only 6 indicated a category other than huntseat or western. These responses (saddleseat, games, or multiple disciplines) comprise the “other” category.

Table 3.11

Analysis of Variance for Riding Discipline and Safety Scores

Section		Df	F	Sig.
Leading	Between groups	2	1.97	0.15
	Within groups	60		
	Total	62		
Stall	Between groups	2	0.44	0.64
	Within groups	60		
	Total	62		
Grooming	Between groups	2	1.59	0.21
	Within groups	60		
	Total	62		
Total	Between groups	2	2.31	0.11
	Within groups	60		
	Total	62		

The next background factor that was investigated was horse ownership. An independent samples *t*-test was used to compare campers who reported owning a horse to those who did not on their mean safety scores. The independent samples *t*-test showed that there was a statistically significant difference between horse owners and non-horse owners in leading safety scores with horse owners scoring higher than non-horse owners. No other differences were found. Table 3.12 shows means and standard deviations as well as the results of the independent samples *t*-test for horse ownership.

Table 3.12

Differences in Ground Safety Scores by Ownership

Section	Horse Ownership	N	M	SD	t	p
Leading	Yes	55	24.15	8.31	2.80	0.02
	No	6	17.17	5.45		
Stall	Yes	55	31.35	5.03	1.40	0.22
	No	6	26.33	8.62		
Grooming	Yes	55	31.05	6.13	0.06	0.95
	No	6	31.17	4.39		
Total	Yes	55	86.54	13.98	2.08	0.08
	No	6	74.67	13.21		

p<0.05

The next background factor investigated was whether the camper had ever taken riding lessons. An independent samples *t*-test was used to compare the ground safety scores of campers who had ever taken riding lessons with those who had not. As shown in Table 3.13, statistically significant differences were found in the stall safety section. Campers who had ever taken riding lessons received higher scores in the stall safety section than campers who had not taken riding lessons. No other differences were found. Table 3.13 shows the results of the independent samples *t*-test as well as means and standard deviations.

Table 3.13

Differences in Ground Safety Scores by Riding Lesson Background

Section	Have you ever taken riding lessons?	N	M	SD	t	p
Leading	Yes	53	23.46	8.01	0.00	0.98
	No	10	23.45	9.45		
Stall	Yes	53	31.71	5.84	3.17	0.04
	No	10	27.80	2.96		
Grooming	Yes	53	31.45	5.73	1.42	0.18
	No	10	27.95	7.36		
Total	Yes	53	86.63	13.65	1.39	0.19
	No	10	79.20	15.77		

p<0.05

The next background factor investigated was whether campers were currently enrolled in a lesson program. An independent samples *t*-test was used to analyze differences in ground safety scores between campers who were currently enrolled in a lesson program with campers who were not currently enrolled in a lesson program. Statistically significant differences were found in leading, grooming, and total safety scores. Campers who were currently enrolled in a lesson program scored higher in those areas than campers who were not currently enrolled in a lesson program. No other differences were found. Table 3.14 shows the results of the *t*-test as well as means and standard deviations.

Table 3.14

Differences in Ground Safety Scores by Current Lesson Enrollment

Section	Do you currently take riding lessons	N	M	SD	t	p
Leading	Yes	34	26.94	7.11	3.40	0.00
	No	23	20.00	7.85		
Stall	Yes	34	30.07	5.62	1.99	0.05
	No	23	32.93	5.10		
Grooming	Yes	34	33.85	2.34	3.81	0.00
	No	23	28.09	6.99		
Total	Yes	34	90.87	11.46	2.80	0.01
	No	23	81.02	14.02		

p<0.05

The final background factor investigated was whether a camper did or did not participate in other 4-H Horse Program activities, such as judging, hippology, or horse shows. An independent samples *t*-test was used to compare differences between mean ground safety scores of campers who did and did not participate in 4-H Horse Program activities. As shown in Table 3.15, there were no differences between the groups. Table 3.15 also shows means and standard deviations for 4-H Horse Program activity participation.

Table 3.15

Differences in Ground Safety Scores by 4-H Activity Participation

Section	Do you participate in other 4-H activities?	N	M	SD	t	p
Leading	Yes	56	23.37	7.91	0.18	0.86
	No	7	24.14	10.84		
Stall	Yes	56	31.33	5.60	0.86	0.42
	No	7	29.21	6.23		
Grooming	Yes	56	30.66	6.32	1.30	0.22
	No	7	32.71	3.51		
Total	Yes	56	85.37	13.79	0.10	0.92
	No	7	86.07	17.93		

p<.05

CHAPTER 4

Summary, Conclusions, and Recommendations

Summary of Study

The purpose of this study was to determine the current level of horse ground safety skills among participants in the North Carolina 4-H horse program, as well as to investigate background factors influencing safety skills. This chapter summarizes the findings of the study. Specifically, the objectives of this study were to:

1. Develop a benchmark of current ground safety skills among North Carolina 4-H Horse Camp participants in the areas of leading, stall, and grooming.
2. Describe the differences in ground safety skills based upon the demographic factors of riding discipline, horse ownership, ever taken riding lessons, currently taking riding lessons, and participation in the 4-H Horse Program.

The review of literature indicated that livestock program involvement is beneficial to the development of necessary life skills in youth; however, proximity to livestock, particularly horses, puts youth at risk. The review of literature also highlighted a lack of research around the field of horse ground safety.

The population for this study was a sample of participants (N=63) in the 2007 North Carolina 4-H Horsemanship Camp, held in June. Eighty campers attended the 2007 session, and 63 participated in this study. Participating campers completed the

researcher-developed demographic questionnaire that consisted of 21 questions. The demographic questions covered a range of topics, including whether the camper currently was taking or had ever taken riding lessons, years of 4-H and horse experience, and other 4-H activity participation. The purpose of this form was to collect information about the campers' horse and 4-H background. Immediately following completion of the demographic form, the campers completed a skills test. The skills test was broken into three sections (stall safety, leading safety, and grooming safety), and each section was scored on a scale of 0-40 by trained horse industry specialists.

Summary of Results

Sixty-three participants of the 2007 N.C. 4-H Horsemanship Camp completed demographic forms and the ground safety skills test. Of those, 88.89% were female and only 11.11% were male. Campers ranged in age from nine to 17, with higher concentrations in the 13-15 year range. Most participants reported living either on a farm or in a town with a population of 10,000 to 50,000 people.

The primary riding disciplines represented were hunt seat and western. The vast majority (87.30%) report that either they or their families own horses. Of those who own horses, 49.12% keep their horses at home, 36.84% board their horses and 10.53% keep their horses at a family member's farm (the remaining 3.17% did not respond).

When asked about their riding experience, 47.62% report that they have been riding horses for five to nine years. Approximately one-third said they had been riding

horses for one to four years, and the remaining 20.63% said they had been riding horses for more than 10 years. The vast majority (84.13%) had taken riding lessons from a professional instructor, and 15.87% have never taken professional riding lessons. Of those who reported taking riding lessons, about half are currently involved in a lesson program. Of those currently taking lessons, 32.35% take lessons more than once a week, 55.88% take lessons weekly, 8.82% take lessons monthly, and 2.94% did not respond.

The majority of participants are relatively new to both the 4-H Horse Program and 4-H Horsemanship Camp. Approximately one-third (31.75%) reported that this was their first year of involvement in the 4-H Horse Program, and 63.49% were attending 4-H Horsemanship Camp for the first time. Years of 4-H Horse Program involvement ranged from one to 10, and the most common responses were one, two, or three years. Years of 4-H Horsemanship Camp attendance ranged from one to seven years, and the most common responses again were one, two, or three years. The majority (88.89%) participate in 4-H activities such as horse judging and creative expression contests, and of those, 69.84% compete in 4-H horse shows.

The first research objective was to develop a benchmark of current ground safety skills in the areas of leading, stall, and grooming. Data related to this objective were collected by administering the ground safety skills test. Participants could earn up to 40 points for each section (leading safety, stall safety and grooming safety) for a possible total of 120 points. The mean total score was 85.45. The stall section had the highest

mean score of 31.10, and the leading section had the lowest mean score of 23.46. The mean grooming score was 30.90.

Of the three skills test sections, the mean score of 31.10 for the stall safety section was the highest. Campers scored highest on skills 2 and 3, which involved safely approaching and haltering the horse. The mean score for skill 2 (quietly approaches horse's shoulder; if horse is not facing forward, moves horse prior to approaching) was 9.05, and the mean score for skill 3 (introduces halter and lead rope quietly; puts on halter correctly and efficiently) was 8.70. Campers scored lowest on skills 1 and 4. The mean score for skill 1 (checks position of horse prior to entering stall; enters stall safely; closes door behind) was 6.56, and the mean score for skill 4 (safely ties horse) was 6.90.

The mean score of the grooming skills safety section was 30.90, making it a very close second to stall section. Participants scored very consistently across all four grooming skills, with mean scores ranging from 7.10 to 8.73. Participants scored highest in skill 1 (works quietly and confidently around horse) with a mean score of 8.73 and lowest in skill 2 (picks up hooves safely) with a mean score of 7.10. Other mean scores were 7.41 in skill 3 (avoids remaining in the danger zone when walking around horse; correctly walks behind horse) and 7.76 in skill 4 (works around rear and tail safely).

The leading safety section posted the lowest mean score of 23.46. Campers scored highest on skill 3 (stops quietly and backs correctly) with a mean score of 7.10. The lowest mean scores were on skill 4 (demonstrates awareness of horse, environment

and other people while standing skill). Relatively low mean scores were reported as well for skill 1 (correctly holds the lead rope in both hands) and skill 2 (maintains correct body position while leading horse at a walk). The mean score for skill 1 was 5.63, and the mean score for skill 2 was 6.32.

The second research objective was to describe the differences in ground safety skills based upon the demographic factors of riding discipline, horse ownership, ever taken riding lessons, currently taking riding lessons, and participation in the 4-H Horse Program. Of the background factors investigated, three were found to lead to increased safety scores: owning a horse, ever taken riding lessons, and currently taking riding lessons. An independent samples *t*-test showed that there was a significant difference in the leading safety scores of horse owners and non-horse owners. An independent samples *t*-test also showed that there was a significant difference in the stall safety scores of campers who had ever taking riding lessons and those who had not. Finally, an independent samples *t*-test showed that there was a significant difference between the leading, grooming, and total ground safety scores of campers who were currently taking riding lessons and those who were not.

The background factors investigated that did not lead to higher safety scores were riding discipline and participation in 4-H Horse Program activities other than 4-H Horsemanship Camp.

Conclusions

Horseback riding can be a fun and rewarding activity for young people; however, it is a sport with inherent risks. Many sectors of the horse industry have taken a stand in encouraging or even requiring the use of helmets during mounted activities. However, statistics from different sources report that one-third to one-fourth of horse-related injuries occur on the ground. This study points out several skill areas where 4-H members are lacking as well as identifies the differences between background factors and safety scores. Based on this study, the researcher draws the following conclusions:

1. Campers who participated in this study received safety scores that were lower than desirable.

The total mean score for ground safety skills was 85.45 out of a possible 120 points. These scores are unacceptable to the researcher. Of particular concern are leading skills, as the mean score for this section was 23.46 out of a possible 40 points. It should be noted that all campers were aware that they were being observed during this study.

There are two possible explanations for the low ground safety scores: a lax attitude towards the importance of ground safety or lack of ground safety skills. A lax attitude toward ground safety is a concern and is supported by the literature. Greene and Trott (2004) claim that “accidents happen when people make false assumptions about the risks involved in working with and around horses” (Faulty Assumptions, 1). They go on

to list some faulty assumptions equestrians make, including “others that are not careful have accidents... not me” and “my school horses are ‘bomb-proof’ and very dependable.” Additionally, riders often develop an “it could never happen to me” mentality. “Sometimes, if people have not experienced an accident, they cannot conceive either the possibility or the potential devastation associated with a serious injury or death” (Greene and Trott, 2004, Faulty Assumptions, 4). The other possible explanation for the low ground safety scores is a lack of skills. It is possible that the campers studied have not been taught how to behave safely around a horse on the ground.

As this study did not investigate attitude, it is impossible to explain which of those factors contributed to the low ground safety skill levels observed in this study. Regardless, it is imperative that steps are taken to address this need because it only takes one mistake for a serious accident to occur. Young equestrians with low ground safety skill levels are at great risk of injury or even death while working around horses.

2. Currently taking riding lessons positively influenced ground safety scores. Horse ownership positively influenced leading safety scores, and ever taking riding lessons influenced stall safety scores.

Of the background factors investigated, three were found to lead to increased safety scores: owning a horse, ever taken riding lessons, and currently taking riding lessons. An independent samples *t*-test showed that there was a significant difference in the leading ground safety scores of horse owners and non-horse owners. Additionally, an

independent samples *t*-test showed a significant difference between the stall safety scores of campers who had taken riding lessons. Finally, an independent samples *t*-test showed that there was a significant difference between the leading, grooming, and total ground safety scores of campers who were currently taking riding lessons and those who were not. One possible explanation for these differences is that campers in all three scenarios receive hands-on experience with horses, arguably more so than campers who do not own horses or do not take lessons. In addition, campers who are taking riding lessons receive supervised hands-on experience. It is interesting to note, however, that campers who had ever taken riding lessons received higher stall safety scores while campers who were currently taking riding lessons received higher total ground safety scores as well as higher leading and grooming safety scores. It seems that when campers stopped taking riding lessons, they continued to practice stall safety. However, campers who were currently taking riding lessons exhibited higher safety scores in more areas. Based on the results of this study, it is important for young equestrians to receive continued formal riding instruction. However, as additional questions regarding riding lessons were not asked on the demographic form, it is difficult to speculate beyond this.

Recommendations

1. Young equestrians need formal instruction on ground safety.

The researcher reports that campers who have taken riding lessons received higher safety scores than those who do not, and campers who were currently enrolled in a

lesson program received higher scores in more areas. These results reinforce the importance of supervised horse instruction of young equestrians by more experienced equestrians in the form of riding lessons. Enrollment in a lesson program would help ensure that youth are taught early in their equestrian careers how to be safe around a horse while on the ground. Though previous research indicates that 4-H involvement leads to increased life skill development (Boleman, Cummings & Briers, 2004), the results of this study indicate that participation in 4-H Horse Program activities are not substitutes for riding lessons. According to this study, participation in 4-H Horse Program activities did not result in higher ground safety scores. However, 4-H opportunities provide a unique classroom for teaching ground safety as participants spend countless hours studying horses. The 4-H Horse Program and local clubs should make an effort to incorporate ground safety into these training sessions.

2. Emphasize the educational benefits of participation in 4-H horse show events as they relate to ground safety.

According to the literature, participation in 4-H livestock programs should be encouraged, as the experience aids in life skill development (Boleman, Cummings, & Briers, 2004). However, a trend that emerged from this study was that horse show competition did not increase youths' safety score. During the skills test, the judges remarked that several campers asked if the leading section was like showmanship, an event where horses are exhibited in-hand. Interestingly, this class originated as a way to

teach young people how to exhibit their animals; however it would seem from the low leading scores and the inquiries made by study participants that they do not make a connection that things they do to win a horse show and things that keep them safe are often one in the same. For example, the quarters system that is popular in western showmanship events encourages the youth to pay close attention to both the judge and the horse; this allows the judge a good look at the horse while allowing the youth to immediately react if the horse moves. Many young people understand that they should move once the judge crosses the shoulder; however, they may not realize that this is also safe horse handling. A greater effort should be made to help youth understand that the things we do in horse shows are often not just for show.

3. Evaluate youth horse programming to ensure it is meeting their educational needs and learning capabilities.

This study revealed some areas of ground safety in which the participants lacked competence. This research does not necessarily indicate a flaw in 4-H or other horse-related youth programming. However, it does indicate a need for these organizations to reevaluate their programs to see if changes need to be made. Young equestrians must learn many things in order to be safe around horses, and they have unique learning styles. Schwab (2006) emphasizes children learn very differently from adults. “Children are not ‘little adults.’ It is not that children have less information than adults, or lack the vocabulary to understand adult information, but that they perceive and react to the world

in entirely different ways... Therefore, communicating effectively with children is not a matter of 'dumbing down' adult information, but creating entirely new messages based on their developmental stages" (Characteristics of Younger Audiences, para. 1).

4. Parents would benefit from formal ground safety training.

More than half of the study participants indicated that their parents are involved as volunteer leaders in their 4-H activities. This parental involvement provides another opportunity to mentor 4-H members and instill good safety techniques in them. The high number of parents volunteering their time indicates that they have an interest in spending time with their children. Thus, investing in the training of parents, particularly those who serve as volunteer leaders, is likely to result in an increased focus on ground safety in 4-H horse clubs.

Recommendations for Future Research

As indicated by the review of the literature, the area of horse ground safety has been neglected. The researcher did not identify any research pertaining specifically to horse ground safety. Thus, the potential for research is endless. It is necessary to learn more about the educational needs of young equestrians and how 4-H and other youth-focused organizations can address those needs.

The following are suggestions for future research:

1. Conduct a follow-up study with the same population at future camp sessions to see how increased exposure to horses and the 4-H Horse Program affected their safety skills.
2. Replicate this study with a larger sample in comparable youth horse programs to investigate background factors and trends.
3. Investigate the attitudes of 4-H members towards ground safety.
4. Replicate this study in different environments such as boarding stables or show facilities.
5. Replicate this study allowing youths to use a horse of their choosing.
6. Expand the study to include other tasks associated with working with horses on the ground, including catching a horse in a field, feeding a horse, or lounging.
7. Analyze current youth horse programming to determine focus on ground safety.
8. Evaluate youth horse programming to ensure it is meeting their educational needs and learning capabilities.

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APPENDIX A
LETTER TO PARENTS

To: Parents or guardians of 2007 4-H Horsemanship Camp attendees

From: Courtney Hathaway, NCSU Graduate Student

Re: Horse Safety Study

Dear Parent or Guardian:

As you know, safety is our first concern in the 4-H horse program, but there is always room for improvement. During 4-H Horsemanship Camp this June, I will be conducting a study to investigate the current level of horse safety knowledge and skills among North Carolina 4-H members. This study is for my thesis and is intended to help us determine the current knowledge and skills possessed by 4-Hers. That information will then be used to develop programs to address those needs.

I would like your permission to include your child in this study. Your child will be asked to perform some routine tasks associated with handling a horse and complete a short written test (see consent form for details). All records will be kept strictly confidential. No reference will be made in oral or written reports which could link your child to the study. The enclosed form entitled "Informed Consent for Research" provides additional information about the study and has a place for signatures. If you give permission for your child to participate in the study, please return the signed form to Emily Sue Temple along with the rest of your camp materials or bring the signed form on the first day of camp.

I will be at camp during the check-in time on Sunday and would be happy to discuss any questions or concerns you may have. You may also reach me at (919) 219-1418 or via e-mail at court.hathaway@earthlink.net.

Thank you,

Courtney Hathaway

Cc: Bob Mowrey, Emily Sue Temple, John Rayfield

APPENDIX B
DEMOGRAPHIC INSTRUMENT

Demographic Instrument

1. Gender:
 - Male
 - Female
2. Date of Birth: _____
3. Counting this year, how many years have you attended 4-H Horsemanship Camp?

4. What county is your 4-H program in? _____
5. Counting this year, how many years have you been involved in the 4-H horse program? _____
6. Place of Residence
 - Farm
 - Town under 10,000 or rural non-farm
 - Town of 10,000-50,000
 - Suburb of City of 50,000 or more
 - City over 50,000
7. Race or Ethnicity
 - White or Caucasian
 - Black or African-American
 - Asian
 - American Indian or Alaskan Native
 - Native Hawaiian or Pacific Islander
 - Hispanic or Latino
 - Other (Please explain: _____)

Horse Background

8. Which discipline do you ride primarily?
 - Western
 - Huntseat
 - Saddleseat
 - Games
9. Including this year, how long have you been riding horses? _____
10. Do you or your family own horses?
 - Yes
 - No
11. If you answered "yes" to question 9, how many? _____
12. If you answered "yes" to question 9, where do you keep your horses?
 - At home
 - Boarding stable
 - Family member's farm

- Other
13. Have you ever taken riding lessons from a professional instructor?
 Yes
 No
14. If you answered “yes” to question 13, was/is your riding instructor a family member?
 Yes
 No
15. Do you currently take riding lessons from a professional instructor?
 Yes
 No
16. If you answered “yes” to question 15, where do you take lessons?
 At home
 Boarding stable
 Family member’s farm
 Other
17. If you answered “yes” to question 15, how often do you take lessons?
 More than once a week
 Weekly
 Monthly

4-H Background

18. Are your parents active as leaders or volunteers in your 4-H horse club?
 Yes
 No
19. Which 4-H Horse Program activities do you participate in?
 Artistic Expression Years participated _____
 Creative Writing Years participated _____
 Cumulative Records Years participated _____
 Demonstration Years participated _____
 Hippology Years participated _____
 Horse Bowl Years participated _____
 Horse shows Years participated _____
 Judging Years participated _____
 Project Records Years participated _____
 Public Speaking Years participated _____
 Other (Please explain: _____) Years participated _____
20. Besides the horse program, do you participate in other 4-H programs (such as livestock, etc.)?
 Yes (Please explain: _____)
 No

APPENDIX C
RUBRICS FOR JUDGES

Grooming Rubric

Skill measured:

Camper will demonstrate the skills needed to safely groom a horse.

Item Measured	Possible Points	Points Awarded
Works quietly and confidently around horse.	10	
Picks up hooves safely.	10	
Avoids remaining in the danger zone when walking around horse; correctly walks behind horse.	10	
Works around rear and tail safely.	10	
Total	40	

1. Works quietly around horse

10 – Moves confidently and quietly around horse.

5 – Camper is overly nervous or timid around horse; camper is loud and jerky around horse.

0 – Intervention required.

*Deduct one point for each movement that startles horse.

2. Picks up hooves safely.

10 – Camper runs hand down horse's leg to ask for foot; squeezes chestnut or ligaments/tendons at cannon bone; runs hand along back when moving from front to rear hoof.

8 – Camper meets the requirements for a 10 but does not run hand along back when moving from front to rear hoof.

5 – Camper meets the requirements for a 10 but tugs at foot instead of squeezing chestnut or ligaments/tendons at cannon bone.

3 – Camper reaches directly for foot.

1 – Camper kneels on ground while cleaning foot.

0 – Intervention required.

3. Avoids remaining in the danger zone while walking around horse; walks safely behind horse.

10 – Avoids walking in front of horse; avoids standing directly behind horse; when walking behind horse, stays close to the hindquarters and keeps a hand on the horse.

8 – Camper meets the requirements for a 10 but lingers when walking behind horse or walks in front of horse once.

5 – Camper walks in front of horse twice or stops while walking behind horse.

2 – Camper consistently puts self at risk by remaining in the danger zone.

0 – Intervention required.

4. Works around rear and tail safely.

10 – Stands off to the side, near the point of the buttock, facing to the rear; camper grasps the tail and draw it around to him/her; stays close to the horse and maintains three points of contact while brushing.

8 – Camper meets the requirements for a 10 but does not maintain 3 points of contact.

5 – Camper reaches for tail as described above, but is in kicking range while holding it; or camper does not stay close to the horse while brushing.

2 – Camper stands within kicking range and reaches for tail.

0 – Intervention required.

Leading Rubric

Skill measured:

Camper will demonstrate the skills needed to safely lead a horse while walking, turning, stopping and backing. Camper will demonstrate an awareness of the horse and other people at all time.

Item Measured	Possible Points	Points Awarded
Correctly holds the lead rope in both hands.	10	
Maintains correct body position while leading horse at a walk (straight line and turning).	10	
Stops quietly while maintaining correct body position; backs correctly.	10	
Demonstrates awareness of horse, environment and other people while standing still.	10	
Total	40	

1. Correctly holds the lead rope in both hands.

- 10 – Holds lead rope in two hands with the right hand at the top of the rope near the snap or chain and the left hand coiled in a figure-8 style around the excess rope.
- 6 – Holds lead rope in the right hand only at the top of the rope near the snap; excess rope is also coiled in right hand in a figure-8 style.
- 4 – Puts right hand on halter, snap or chain and holds excess lead rope in right hand in a figure-8 style.
- 2 – Excess rope is too long and/or excess rope is wrapped around hand or drag on the ground.
- 0 – Intervention was required.

2. Maintains correct body position while leading horse at a walk (straight line and turning).

10 – Leads horse from the left side close to the horse's throatlatch; maintains personal space but does not get too far away; turns horse away from him/her self.

8 – Meets all requirements for a 10, but holds the rope in one hand.

5 – Walks in incorrect position (too close or too far from horse; too far ahead or too far back); turns horse toward him/her self.

1 – Walks in front of horse or behind the proper leading point; leads from right side; struggles to maintain control of horse.

0 – Intervention was required.

3. Stops quietly while maintaining correct body position; backs correctly.

10 – Maintains position near horse's throatlatch; quietly uses combination of verbal cues, body and lead rope to cue horse to stop; turns to face horse while backing but does not stand in front of horse; backs using combination of verbal cues and lead rope.

8 – Meets all requirements for a 10 but startles horse by stopping too quickly.

5 – Loses body position (too close or too far from horse; too far ahead or too far back); gets in front of horse while backing.

2 – Struggles to maintain control of horse.

0 – Intervention was required.

4. Demonstrate awareness of horse, environment, and other people while standing still.

10 – Scans environment and horse for possible danger; stays on same side as evaluator during inspection; does not stand directly in front of horse; corrects horse if necessary.

8 – Meets all requirements for a 10, but could be more aware of horse or environment.

6 – Meets all requirements for a 10 but does not stay on same side as evaluator.

4 – Handler lingers in front of horse while switching sides.

2 – Attention is not sufficiently focused on both horse and environment; camper consistently stands in front of horse; struggles to maintain control of horse.

0 – Intervention was required.

Stall Safety Rubric

Skill measured:

Camper will demonstrate the skills needed to safely catch a horse, put on a halter, and prepare to lead it from the stall. (Note: leading will be evaluated at another station, so camper will not bring the horse from its stall here.)

Item Measured	Possible Points	Points Awarded
Checks position of horse prior to entering stall; enters stall safely; closes door behind.	10	
Quietly approaches horse's shoulder; if horse is not facing forward, moves horse prior to approaching	10	
Introduces halter and lead rope quietly; puts on halter correctly and efficiently.	10	
Safely ties horse.	10	
Total	40	

1. Checks position of horse prior to entering stall; enters stall safely; closes door behind.

10 – Checks position of horse before entering stall; makes noise/speaks to horse to alert horse of presence; quietly uses voice, hands, rope, etc. to encourage horse to move if horse is in an unsafe location; closes door after entering.

5 – Meets all of the requirements for 10, but not all; did the requirements as an afterthought or from an unsafe location.

1 – Does not close stall door; enters stall without checking horse's location; horse may not have known handler's presence and could have been startled; intervention was required.

0 – Intervention was required.

2. Quietly approaches horse's shoulder; if horse is not facing handler, moves horse prior to approaching.

10 – Quietly and confidently approaches horse; moves horse if horse is not facing handler.

8 – Approaches shoulder and moves horse if necessary, but approaches horse too aggressively; horse appears frightened or threatened.

5 – Endangers self by moving to horse's shoulder without safely asking horse to move.

2 – Approaches horse from the rear.

0 – Intervention was required.

3. Introduces halter and lead rope quietly; puts on halter correctly and efficiently.

10 – Introduces halter and lead rope quietly; places rope around neck before attempting to halter; puts halter on correctly on the first try; double checks adjustment.

8 – Meets all of the requirements for a 10 except putting rope around neck OR double checking adjustment.

5 – Has to start over once, but does put halter on correctly.

2 – Has to start over two or more times, but does put halter on correctly.

0 – Puts on halter incorrectly; unable to halter horse without assistance; intervention was required.

4. Correctly ties horse.

10 – Correctly and efficiently ties quick-release knot; horse is tied short enough that he could not get hung in the rope; horse is tied to a post and not a board.

8 – Meets all of the requirements for a 10 but has to start over on knot once.

5 – Meets all of the requirements for a 10 but has to start over on knot twice or ties horse to a board.

3 – Ties horse too long.

0 – Intervention was required.

APPENDIX D

N.C. STATE UNIVERSITY IRB APPROVAL LETTER

NC STATE UNIVERSITY

Sponsored Program and
Regulatory Compliance
Campus Box 7514
1 Leazar Hall
Raleigh, NC 27695-7514
919.515.7200
919.515.7721 (fax)

From: Debra A. Paxton, IRB Administrator
North Carolina State University
Institutional Review Board

Date: May 11, 2007

Project Title: Investigating Horse Safety Knowledge Among North Carolina 4-Hers: A
Qualitative Study

IRB#: 224-07-5

Dear Ms. Hathaway;

The project listed above has been reviewed in accordance with expedited review procedures under Addendum 46 FR8392 of 45 CFR 46 and is approved for one year from its date of review. **This protocol expires on May 20, 2008 and will need continuing review before that date.**

NOTE:

1. This board complies with requirements found in Title 45 part 46 of The Code of Federal Regulations. For NCSU the Assurance Number is: FWA00003429; the IRB Number is: 01XM.
2. The IRB must be notified of any changes that are made to this study.
3. Your approval for this study lasts for one year from the review date. If your study extends beyond that time, including data analysis, you must obtain continuing review from the IRB.

Please provide a copy of this letter to your faculty sponsor. Thank you.

Sincerely,
Debra Paxton
NCSU IRB