



**June 2010**  
**Volume 48 Number 3**  
**Article Number 3RIB5**

[Return to Current Issue](#)

## **Assessing Ground Safety Knowledge of North Carolina 4-H Horse Program Participants**

**Courtney H. Beck**

Graduate Assistant

Department of Agricultural and Extension Education

North Carolina State University

Raleigh, North Carolina

[courtneyhbeck@gmail.com](mailto:courtneyhbeck@gmail.com)

**John Rayfield**

Assistant Professor

Department of Agricultural Leadership, Education and Communications

Texas A&M University

College Station, Texas

[jrayfield@tamu.edu](mailto:jrayfield@tamu.edu)

**Jim Flowers**

Professor and Chair

Department of Agricultural and Extension Education

North Carolina State University

Raleigh, North Carolina

[jim\\_flowers@ncsu.edu](mailto:jim_flowers@ncsu.edu)

**David Jones**

Assistant Professor

Department of Agricultural and Extension Education

North Carolina State University

Raleigh, North Carolina

[dwjones@ncsu.edu](mailto:dwjones@ncsu.edu)

---

**Abstract:** The study reported here sought to benchmark current levels of horse ground safety among participants in the North Carolina 4-H Horse Program. By understanding current levels of horse ground safety, programming can be developed to increase safety in this sport. Sixty-three horse camp participants were assessed on the safety skills in four separate areas: leading safety, stall safety, grooming safety, and total safety score. Camp participants posted the highest scores on stall safety and the lowest scores on leading safety. Further research is needed to pinpoint other safety areas that are often neglected in horse and other livestock events.

---

## 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 (2008), there are 9.2 million horses in the United States, primarily kept for recreation or showing. One out of every 63 Americans is involved in the horse industry as owner, service provider, employee, or volunteer. The horse industry has a direct annual economic impact on the United States of \$39 billion (American Horse Council, 2008). In 2003, there were 411,202 youths enrolled in the 4-H horse program (National 4-H Headquarters, 2003).

Participation in 4-H livestock programs should be encouraged, because there are many benefits for youth to glean from the experience. According to Boleman, Cummings, and Briers (2004), parents believed that 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.

Despite the positive ramifications of participating in a 4-H livestock project, working with animals can be dangerous. Horseback riding is an inherently dangerous sport, as suggested by the fact that 44 states have equine limited liability statutes (Greene & Trott, 2004). Youth under 15 years represent one in five equestrian-related emergency department visits in the United States. Holland, Roy, Goh, Ross, Keneally, and Cass (2001) noted, "the physical differences between horses and children predispose towards severe injury and are compounded by the potential for unpredictable behavior in both species" (p. 609).

Though the literature confirms 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, 2003). Kicking, biting, and charging are common causes of horse ground-related injuries. The study reported here was conducted to benchmark 4-H horse program participants' knowledge of ground safety when working with horses. Many 4-H horse programs at the local and state level have greatly emphasized the importance of riding safety and helmet use in equestrian events. Comparatively, the area of ground safety in youth horse programming has received little attention.

## Purpose and Objectives

The purpose of the study reported here 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 the study were to:

- Develop a benchmark of current ground safety skills among North Carolina 4-H Horse Camp participants.
- Identify relationships between demographic factors of 4-H horse camp participants and their total ground safety score.

## Methods/Procedures

The data for the 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 are expected to have the ability to independently care for their horses throughout the week. Campers of all riding disciplines are accepted. Parental consent forms were mailed out with the camp information packets. Eighty campers attended the 2007 session, and 63 returned the parental consent forms and participated in the study, for a response rate of 79%. Participating campers completed a skills test on the first day of camp designed to measure the 4-Hers' horse ground safety skills.

The descriptive study used survey research methods. The purposive sample consisted of 4-H members who attended the 2007 North Carolina 4-H Horsemanship Camp. A purposive sample was chosen because the researcher, based on communication with North Carolina Extension horse specialists, believed camp attendees would be representative of participants in the North Carolina 4-H Horse Program (Fraenkel & Wallen, 2006).

The rubrics 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 campers were required to complete a skills performance test. The skills test was broken into three sections: stall safety, leading, and grooming, from which a total score was determined. 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 good disposition. All observations were made the first day of camp.

During the skills test, each camper's performance was observed and scored by a panel of trained horse industry experts who were either Regional Equine Information Network System (REINS) volunteers or riding instructors. The REINS organization is dedicated to distributing information to the North Carolina equine industry and is volunteer based. 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.

Prior to the skills test, the judges underwent comprehensive training and were given rubrics to guide their scoring. The rubrics were prepared by the authors and peer reviewed by stakeholders in the North Carolina horse industry and university faculty for face validity. The rubrics outlined specific tasks on which the campers were to be judged, as well as scoring guidelines. The authors 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.

## Findings

Research objective one was to develop a benchmark of current horse ground safety skills possessed by North Carolina 4-H Horse Camp participants. Means and standard deviations were used to describe results of the

ground safety skills test, which were recorded in interval scale variables. Each of the three sections 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. Table 1 shows the means and standard deviations for all sections of the skills test.

**Table 1.**  
Ground Safety Scores of 4-H Horse Camp Participants

Test Section	N	Mean	Std. Deviation
Leading	63	23.46	8.18
Stall	63	31.10	5.66
Grooming	63	30.90	6.09
Total	63	85.45	14.14
<i>Note.</i> Mean score for each section is out of a possible 40. Mean total score is out of possible 120.			

Research objective two was to identify relationships between demographic factors of 4-H horse camp participants and their total ground safety score. Pearson product-moment correlations ( $r$ ) were used to identify relationships between the number of years involved in the 4-H horse program, years of riding experience, participants' age, and their total ground safety score. According to Davis (1971), the correlations between demographic variables and total ground safety scores would be considered negligible. Table 2 shows means scores for demographic factors and Pearson correlations between demographic factors and total safety scores.

**Table 2.**  
Relationship Between Demographic Factors and Total Ground Safety Scores

Demographic Factors	f	$r$
Years involved in 4-H horse program	1 <sup>st</sup> year â 20	.01
	2 <sup>nd</sup> year â 9	
	3 <sup>rd</sup> year â 10	
	4 <sup>th</sup> year â 6	
	5 <sup>th</sup> year â 6	
	6 <sup>th</sup> year â 3	
	7 <sup>th</sup> year â 2	
	8 <sup>th</sup> year â 0	
	9 <sup>th</sup> year â 1	

	10 <sup>th</sup> year â 2	
Years of riding experience	1-4 years â 20	.01
	5-9 years â 30	
	10 + years â 13	
Age	9 years â 5	.06
	10 years â 7	
	11 years â 5	
	12 years â 6	
	13 years â 11	
	14 years â 8	
	15 years â 13	
	16 years â 3	
	17 years â 1	
<p><i>Note.</i> N = 63, some cases missing in years involved in 4-H horse program and age. <math>r = .01</math> to <math>.09</math> â negligible, <math>r = .10</math> to <math>.29</math> â low, <math>r = .30</math> to <math>.49</math> â moderate, <math>r = .50</math> to <math>.69</math> â substantial, <math>r = .70</math> to <math>.99</math> â very high, <math>r = 1.0</math> â perfect.</p>		

## 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. The study reported here points out several skill areas where 4-H members are lacking in ground safety knowledge.

Based on low ground safety mean scores, 4-H members in the study did not follow good basic ground safety practices with horses. The review of the literature discussed the high risk of horse-related activities, as well as the cost and fatality rates associated with these accidents. However, the literature also suggests that some accidents could be avoided if proper precautions were taken. The low mean ground safety scores found in the study reported here, particularly in the area of leading, support these assertions.

According to the Children's Safety Network Rural Center (1997), there are eight demographic factors that can contribute to horse-related injuries. These include age, experience level of the rider, and the riding discipline. There was no statistically significant relationship between the participants' age, years of riding experience, the number of years they had been involved in the 4-H horse program, and their total ground safety score. Regardless of the 4-H horse program participants' age or level of experience around horses, there needs to be greater emphasis placed on all aspects of teaching and modeling safety.

## Recommendations/Implications

Youth horse programming in 4-H needs to be evaluated to ensure it is meeting the educational needs and learning capabilities of participating youth. The study reported here revealed areas of ground safety in which the participants lacked competence. The 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 re-evaluate their programs to determine if changes are needed. Young equestrians must learn many things in order to be safe around horses.

The authors recommend that future research should be conducted to replicate the study with a larger sample in comparable youth horse programs to investigate background factors and trends. A follow-up study should be conducted at future camp sessions to measure how increased exposure to horses and the 4-H horse programs affect safety skills of participants. The scope of the study should be expanded to include other daily tasks associated with horse ground safety such as: catching a horse in the field, feeding a horse, or lunging. Further research is needed to determine the focus of ground safety in 4-H horse programming as well as the educational value and appropriateness of current 4-H horse safety programming.

The implications for the study reach much further than the 4-H horse program. Many horse, pony, and breed associations within the horse industry can use this information to establish a baseline for ground safety knowledge among their horse program participants. Although this project is very relevant to the horse industry, there is also value in this line of inquiry for other 4-H and FFA youth livestock projects and safety concerns within those programs. Are youth involved in livestock projects always properly educated about livestock safety prior to undertaking their project? Proper safety education is a necessity in all youth programs.

## References

- American Horse Council (2008). Highlights of the national economic impact of the U.S. horse industry. Retrieved July 12, 2007 from: <http://horsecouncil.org/economics.html>
- Boleman, C., Cummings, S., & Briers, G. (2004). Parents' perceptions of life Skills gained by youth participating in the 4-H beef project. *Journal of Extension* [Online], 42(5) Article 6RB. Available at: <http://www.joe.org/joe/2004october/rb6.shtml>
- Children's Safety Network (1997). Horses and children fact sheet. Rural Injury Prevention Resource Center.
- Children's Safety Network (2003). Equestrian safety fact sheet. Brochure published by the Children's Safety Network.
- Davis, J. A. (1971). *Elementary survey analysis*. Englewood, NJ: Prentice-Hall.
- Fraenkel, J. R., & Wallen, N. E. (2006). How to design and evaluate research in education. McGraw-Hill: 100.
- Greene, E. A., & Trott, J. F. (2004). The Self-Guided Horse Facility Analysis: A proactive safety education tool for equine facilities. *Journal of Extension* [On-line] 42(6) Article 5 TOT. Available at: <http://www.joe.org/joe/2004december/tt5.php>
- Holland, A. J. A., Roy, G. T., Goh, V., Ross, F. I., Keneally, J. P., & Cass, D. T. (2001). Horse-related

injuries in children. *The Medical Journal of Australia*, 175,609-612. Retrieved July 19, 2007 from:  
[http://www.mja.com.au/public/issues/175\\_12\\_171201/holland/holland.html](http://www.mja.com.au/public/issues/175_12_171201/holland/holland.html)

National 4-H Headquarters (2003). *Annual 4-H Youth Development Report*. Retrieved July 15, 2007 from  
<http://www.national4-hheadquarters.gov>

---

*Copyright* © by *Extension Journal, Inc.* ISSN 1077-5315. Articles appearing in the Journal become the property of the Journal. Single copies of articles may be reproduced in electronic or print form for use in educational or training activities. Inclusion of articles in other publications, electronic sources, or systematic large-scale distribution may be done only with prior electronic or written permission of the *Journal Editorial Office*, [joe-ed@joe.org](mailto:joe-ed@joe.org).

If you have difficulties viewing or printing this page, please contact [JOE Technical Support](#).