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# What We Know About the Effectiveness of Farm Safety Day Programs and What We Need to Know

Debra Moehle McCallum, PhD;[1] Shannon Murphy, MA;[2] Deborah B. Reed, PhD, MPH, RN;[3] Deborah T. Claunch, BBA;[3] & Susan J. Reynolds, MS[4]

1 Institute for Social Science Research, University of Alabama, Tuscaloosa, Alabama
2 Institute for Social Science Research and Department of Psychology, University of Alabama, Tuscaloosa, Alabama
3 College of Nursing, University of Kentucky, Lexington, Kentucky
4 Progressive Agriculture Foundation, Birmingham, Alabama

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For further information, contact: Debra M. McCallum, PhD, Box 870216, University of Alabama Tuscaloosa, AL 35487; e-mail: dmccallu@ua.edu.

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## ABSTRACT

**Background:** Farm safety day camps are grassroots educational interventions organized and conducted by members of a local community. These events are held in an effort to promote safety knowledge and behavior in children who live on family farms or are exposed to the hazards of the agricultural industry. Since the dramatic increase in farm safety day camps beginning in the 1990s, researchers have been called upon to evaluate their effectiveness.

**Purpose:** The current paper reviews more than a decade of research, describing what is currently known about the effectiveness of farm safety days and suggesting potential methods for addressing questions regarding gaps in what we know about their effectiveness.

**Conclusions:** The results of these evaluations indicate that farm safety days have a positive impact on children's safety behavior and knowledge; however, much remains to be investigated regarding the effectiveness and impact of these interventions.

**Key words** childhood safety, farm safety, farm safety day camps, rural, safety education.

The agriculture industry is consistently ranked as one of the most hazardous industries in the United States with some of the highest rates of work-related injuries and deaths.[1] Agriculture is a unique profession in that children who live on farms are exposed to, and participate in, the family business of farming. Moreover, children who work on their family farm fall outside the regulation of governmental safety and labor policies.[2] There currently are no regulations that govern children being on a farm, even if they are not engaged in the actual business of farming. There is often little separation between work areas and play or living areas, thus children living on or visiting a farm may be in close proximity to safety hazards. The lack of regulatory authority also contributes to a lack of accurate documentation and information regarding exposure to risk and injury rates.[3] In 2006, approximately 1.1 million children were living on their family's farms, an additional 307,000 youth were hired to do work on farms, and 29.3 million more were exposed to agricultural hazards through occasional or regular visits to farms.[4] During the same year, injuries to youth on farms were estimated at 22,900. Injury rates have been declining, but children constitute approximately 19% of all agriculture-related fatalities and hospitalizations.[2] In 2009, more than 15,000 youth were injured on farms,[5] and between 1995 and 2000, there were 695 farm-related youth fatalities.[6]

A survey of Iowa farm households found that the average age for beginning to ride on tractors was 7, for driving tractors was 11, for driving all-terrain vehicles was 11, for driving pickup trucks was 12, and for driving a self-propelled combine was 13.[7] Both parent and youth opinions concerning the appropriate age for starting these tasks were approximately 2 years older than these averages. This is similar to an earlier study which found that the average age of a child's first operation of farm



 

machinery was 12 years, despite the fact that parents expressed the opinion that children were not capable of operating machinery until age 15.[8]

Although children are allowed by parents to participate in farm work, there has been a national emphasis on childhood safety since the early 1990s, and there is evidence that parents are aware of the hazardous nature of agricultural work for children. A survey of farm parents found that 66% perceived working on a farm as being more dangerous for their children than other types of work, and 43% perceived that children living on a farm are more at risk for injury than children who do not live on a farm.[9] Despite holding these attitudes, parents believe that the benefits their children gain by being raised on a farm and participating in farm work outweigh the potential hazards and risks of engaging in such work,[10] and substantial numbers of children are assigned to farm work even at very young ages.[11] In a review of pediatric farm injuries, it was found that many injuries occurred when children were not adequately supervised in terms of the availability, proximity, and continuity of supervision.[12]

Researchers have attempted to identify and quantify the particular types of hazards that children are exposed to while working or playing on the farm. Hazards to which children may be exposed include lawn mowers, tractors, grain bins, farm machinery, livestock, and yard/garden chemicals. Among rural children, as expected, those who live on farms report more exposure to these hazards than non-farm children, and boys report more exposure than girls.[13] Lawn mowers and yard/garden chemicals were the hazards to which they had the most exposure, and self-reported injuries were most often related to livestock, followed by yard/garden chemicals, then lawn mowers.

Although farm communities suffer from high rates of agriculture-related injury, they are sometimes resistant to external expert intervention and an attitude seems to exist among the farming community that "Accidents are just a part of the business of farming and farmers must live with them."[14] In response to this reluctance to allow outside safety intervention, grassroots, community-based farm safety day camps designed to raise awareness of farm safety and educate children on the hazards of farm life expanded greatly in the 1990s.[15]

Typically, a farm safety day camp is a community-based, one-day program for children, held at a single site, divided into 10- to 30-minute segments led by local resource people. Participants move in small groups through various stations throughout the day, experiencing demonstrations, discussions, and interactive activities covering a variety of farm-related safety and health topics. Often programs send educational materials home with the children to reinforce safety messages.[15] Numerous organizations fund and help organize these events. The Progressive Agriculture Safety Day® program (formerly Progressive Farmer Farm Safety Day Program), for example, sponsors more than 400 Farm Safety Days annually across North America, with a total combined attendance of over 70,000 children.[16] Other organizations funding and conducting farm safety day camps at the local and national levels include Farm Safety 4 Just Kids, Farm Bureau, and cooperative extension services.

Despite the popularity of farm safety day camps in North America, systematic evaluation of their effectiveness has only recently been undertaken. Reviews of farm safety interventions published in 2000 and 2004[2,17] identified only 3 evaluations of farm safety day camps, and 2 of these were unpublished. Since then, several comprehensive evaluations of farm safety days have been conducted, establishing a broader foundation for effectiveness of these events in improving children's safety on the farm. Overall, the results of these evaluations have established a general pattern that participants increase their safety knowledge and decrease risky behavior following participation in a farm safety day camp. In one study, 94% of participants had a net gain in safety knowledge, safe behavior, or both.[18] At the same time that farm safety day camp programs were growing, official reports of farm injury rates for children were decreasing.[19] From 1998 to 2009, the injury rates for youth living on farms decreased from 18.8 per 1,000 household youth to 9.8 per 1,000 household youth.[5] Farm safety day camps have likely made an important contribution to the declining injury rates, and therefore, it is important to investigate their effectiveness and ways to make them more effective. Recent evaluations have done much to document the effectiveness of farm safety day camps; however, there are gaps and limitations to this research, and much still needs to be known that could strengthen the effects. What is currently known about the impact of farm safety day camps will be discussed below, followed by a discussion of what we still need to know. The studies cited involve typical one-day farm safety day camps as described above, with the exception of the evaluation of a more extended 3- to 4-day camp.[20] Although unusual in its length, this program shared many similarities with typical farm safety day camps and provides some useful data on effectiveness of farm safety education for children.

## What We Know

We will consider what we know about changes in safety knowledge, changes in safety-related behaviors, and injuries for safety day participants, as well as the effects of farm safety day camps on the larger community.

## Effects on Safety Knowledge

Evaluations using pre-post designs without control or comparison groups have demonstrated that safety day participants increase their safety knowledge between the pretest and posttest. Farm safety day participants in 3 annual national samples from the Progressive Agriculture Safety Day program showed an increase in knowledge across a 3-mo time span that began with a written pre-camp test and ended with a telephone administered posttest.[18] Of note, improvements in knowledge scores resulted primarily from a decrease in "don't know" responses, indicating that children did not necessarily have misinformation prior to attending camp, but that they lacked appropriate information prior to camp attendance. Similar results were noted in a study of 1,220 children in grades 3–5 who participated in Farm Safety 4 Just Kids Safety Days in 2002–2003.[21] In an 18-mo post-camp follow-up, the majority of children still retained the knowledge.[22]

Evaluations with pre-post comparison group designs have shown that safety day participants increase their safety knowledge more than children who do not participate in a safety day. Children who had attended an extended 4-day farm safety day camp in the previous year had a significantly higher pretest score the next year compared with a group of children who were attending for the first time.[20] In a traditional one-day camp, knowledge gains were found both for participants and a non-participant comparison group; however, participants' gains were significantly larger at the one-year follow-up mark than the gains for non-participants.[23]

## Effects on Safety-Related Behaviors

In pre-post designs without comparison groups, evaluations have shown that farm safety day participants decrease their risky behavior following participation in a safety day. In one study, 3 mo after a safety day 62% of participants reported decreases in risky behaviors.[18] In another study, at 1 mo post-safety day, 40% of the children reported they had made farm behavior changes and one-third reported they had stopped playing around high-risk areas on the farm.[24] Likewise, campers in the 4-day safety event reported safer behaviors 6 mo after participation, such as being more cautious around animals (100%) and not being an extra rider on a tractor (71%).[20] With a non-participant comparison group, an increase in self-reported safe behavior over time from pretest to posttest was found for both participants and non-participants, although the increases were greater for farm safety day participants.[23]

Behavioral changes may go beyond the child who participated in the safety day. One study found that 90% of parents said their children came home and talked about what they learned at camp, which sparked changes in the family's safety practices.[25] Another found that 57% of parents were able to cite a way in which the camp helped make their child safer, and 22% of parents reported that they had made a safety-related change in their family after the child's camp attendance.[26] Similarly, a third study reported that 27% of the parents of children who had attended a farm safety day camp said their child was practicing better safety behaviors, and 18.5% of parents said they had tried to replicate and reinforce lessons learned at the camp.[13] These and additional findings make it apparent that even though children are not in roles of management on the farm, they can still effect positive changes in safety behavior on the farm by sharing information learned at farm safety day camps with their families.[16]

## Effects on Reported Injuries

Most evaluations of safety days have relatively small sample sizes, and thus it is difficult to detect reductions in injury rates. However, there is some evidence that farm safety day participants report fewer injuries at follow-up points than comparison groups of children who did not attend a farm safety day camp. McCallum and associates[23] found that self-reported injuries for the preceding 3 mo decreased among farm safety day participants from 15.6% at the pretest (safety days in this sample were held at varying times of the year) to 8.4% at the 3-mo posttest, but then they increased to 12.9% at the one-year posttest. Thus, injuries reported at the one-year mark were still lower than at the pretest. For non-participants, there was no change in reported injuries across the time points. Supporting these findings, Hughes and Hartley[20] reported that surveillance data indicated childhood agricultural injuries declined in the counties that participated in the GA Healthy Farmers farm safety day camps as compared to other counties with agriculture industries. On the other hand, Reed and associates[25] did not find any change in injuries from baseline through an 18-mo follow-up.

## Effects for Boys and Girls

Overall, it has been reported that boys and girls both benefit from participation in a farm safety day camp. Hughes and Hartley[20] reported that attendance had a positive impact on farm safety knowledge for both male and female participants. Boys scored somewhat higher on the

pretest, but boys and girls were not significantly different in their posttest scores and the amount of change was not significantly different for boys and girls. McCallum and associates[18] reported that although boys scored higher on safety knowledge than girls at both pretest and posttest time points, there was a significant increase in safety knowledge for both sexes from the pretest to a 3-mo posttest. Furthermore, there was a significant decrease in exposure to risk or risk-taking behaviors between pretest and posttest for both sexes, although boys reported higher overall exposure to risk than girls. However, Reed and associates[21,27] found that girls scored higher than boys on both the pretest and the posttest, but they showed equal amounts of learning. Therefore, results for gender differences are inconsistent in terms of absolute levels of knowledge, but the results are very consistent in showing that both boys and girls gain from their experience with the safety day.

## Effects for Farm Residents and Non-Farm Residents

Evaluations have found that both children who live on farms or ranches and children who live elsewhere benefit from participation in farm safety day camps. Significant increases in safety knowledge have been found for all children from pretest to 3-mo posttest, although farm children scored higher on safety knowledge than non-farm children.[18] While non-farm children started off with lower levels of knowledge, they had greater increases compared with farm children. Additional evidence for the positive effects on knowledge for both farm and non-farm children was found in posttest and follow-up surveys of farm safety day camp participants at 1 and 6 mo.[21,27] Safe behavior was similarly affected, with risky behaviors or exposure to risk decreasing significantly from pretest to posttest both for farm and non-farm children, although farm children reported higher exposure to risk overall than non-farm children.[18]

## Effects for Various Ages

Children of all ages within the targeted audiences appear to benefit from farm safety day camps. Evaluations that have reported across age groups have found a significant increase for all ages in safety knowledge from pretest to posttest.[18,21-23] Furthermore, while there was an expected increase in risky behaviors or exposure to risk with increasing age levels, there was a significant decrease in these behaviors between pretest and follow-up for every age level.[18,23]

## Magnitude of Change and Endurance of Effects

The beneficial effects of attending a farm safety day camp are significant and long lasting. Reported overall effect sizes for changes in knowledge and behavior are typically in the designated "medium" range[28]: 0.40 effect size for knowledge, and 0.65 effect size for behavioral risk.[18] Increases in knowledge have been found to endure for at least a year,[20,23] and up to 18 mo in one study.[22]

## Quality of Instruction and Effects of Camp Characteristics

Farm safety day camp sites vary on numerous characteristics such as instruction methods, background of instructors, site location, length of instruction, and so on. At Progressive Agriculture Safety Days, volunteer safety instructors receive the same curriculum materials, but individual sites vary in the particular topics they choose to address, expertise of instructors, and levels of adherence to the lesson plans provided.[26] Likewise, within sites, instructors vary on characteristics such as prior teaching experience, training on safety issues, motivation for participating, and use of prepared materials.[29] Several studies show, however, that these variations do not nullify the overall effectiveness of farm safety day camps. For example, in a study of 6 camps with wide variation in instructors, it was concluded that variations in camp instruction did not affect the overall findings.[27] Data from a larger sample of 28 camps also showed little effect for the variations in camp characteristics such as number of sessions, length of sessions, size of groups, or type of safety day (school-based vs community-based).[30]

Although the safety day camp instructors are usually volunteers, and many have no formal training in the content area they are teaching, observational studies indicate they generally offer a rich and safe context for learning. A review of 20 studies evaluating the effectiveness of widely varying educational interventions designed to prevent childhood agricultural injuries found that school-based interventions, including farm safety days, consistently showed increases in safety knowledge and changes in attitudes toward farm safety, with enhanced outcomes when information delivery was active and hands-on.[2] Observations of instructors at farm safety days found that the majority of them had prior teaching experience in some format and that instructors made sure that students were not exposed to risk during instruction.[31] In addition, the instructors' teaching approach in this setting tended to be fast-paced and didactic, frequently using group recitation to check for understanding and to reinforce key points. The instructors used props to reinforce points and to provide demonstration, but they were

clearly pressured to cover many points of information in a small amount of time. Overall, it appeared that instructors met the objectives of increasing student awareness and recognition of risks and hazards on farms during the farm safety day camp.

### Family and Community Benefits

People who have experience planning and organizing farm safety day camps often cite benefits that go beyond the immediate experience of the children who participate in the event.[26,32] One such benefit is that children who attend the camp share the safety knowledge with family and friends at a later time. Thus they are reminding parents of safety concerns and can teach younger siblings or friends some of the concepts they learned. Hughes and Hartley[20] discussed anecdotal reports that on the way home from the farm safety day camps, children told their parents everything that was "wrong" or unsafe with their family farms. Claunch and associates[16] reported that 90% of the parents stated their children talked to them about the safety day messages, and 75% of the parents stated they learned new farm safety information as a result, although the parent did not attend the event. At 1 mo post camp, 20% of the parents who lived on farms had made at least one safety change, primarily in terms of increased supervision and new safety rules. At 6 mo post camp, 16% of farm parents stated they had made changes in their own behavior, 36% had instituted a "no extra rider rule" for tractors, 3% had installed a roll-over protection structure on a tractor, and 30% had improved animal confinement areas.[33]

In addition to the young participants and their families, the effects of the safety messages also spread throughout the local community through the many volunteers participating in the organization, implementation, and instruction of farm safety days. In surveys from more than 5,000 volunteers who had served in various capacities including instruction, group leaders, and planning committees, 66% of these volunteers said they had learned new safety information while volunteering, and 67% said they planned to make safety-related changes in their own homes as a result of their participation in the farm safety day camp.[26]

In response to an open-ended question about community benefits of farm safety days, nearly half of safety day coordinators (48%) mentioned a general increase in safety awareness at the community level; and they also suggested that farm safety days can bring a community together as individuals and groups are called upon to work toward the common goal of helping keep their children safe.[26]

From these results it is apparent that farm safety day camps not only are informative for the children who attend, but they benefit the local communities and the families of the participants as well.

### Volunteer and Parent Satisfaction

The farm safety day camps rely almost completely on volunteers from the community, and these volunteers have a vested interest in the farm community. In one study, 80% of the instructors reported extensive farm experience and most had provided previous safety sessions in the past.[29] Volunteers at farm safety day camps have reported that the experience was rewarding (94%) and one that they would like to participate in again (83%).[26]

When asked about their children's experience at farm safety day camps, 99.5% of parents surveyed said they would recommend that other families send their children to farm safety day camps like the one their child attended, and 98% said they would send their child to the camp again.[26] Ninety-five percent of these parents said the camp was effective at making their child safer, and 47% described specific positive safety-related changes in their child's behavior. In a separate study among farm families, 99% believed the camp was effective for increasing their child's safety knowledge, and 96% felt it had affected the child's safety behavior.[24] Another study also reported that 80% of parents thought the farm safety day camp was beneficial to their child; however, it is important to note that 60% said they would not be likely to take their child to one if it were not part of the school field trip.[13]

## Summary

The studies that have been cited are listed in Table 1 with their methodology and major findings. As noted in this table, a number of the papers and articles cited were based on data collected in 3 large projects conducted by the authors. These related papers are grouped together under the method for the larger project. Across all the reviewed studies there are a number of conclusions that can be drawn regarding the impact of farm safety days on the participants. There is ample evidence that farm safety day participants increase their safety knowledge and their safety-related behaviors, and it appears they do so more than non-participants. In some studies farm safety day participants report fewer injuries at follow-up points than at the pretest, and they report fewer injuries than non-participants. However, this finding is not consistent and there are few good assessments of injuries.

**Table 1** Summary of Papers Cited

| Project/Paper | Purpose and Methodology | Conclusions |
|---|---|---|
| **A. McCallum, DM** | *Purpose:* Evaluation of Progressive Farmer Farm Safety Day Camp program, 1999-2001.<br>*Sample:* 1,780 participants from 72 sites (20 to 30 sites each year for 1999, 2000, and 2001); 924 parents of participants; camp coordinators from 228 sites; and 5,037 volunteers from 228 sites.<br>*Procedures:* Participants completed a written pretest and a 3-mo telephone posttest. Parents completed a telephone interview at the 3-mo posttest. Camp coordinators and volunteers completed written questionnaires. | |
| McCallum et al[18] | Using data from the children who participated in the safety day camps, reported on the knowledge and behavior changes in the participants from pretest to posttest. | • Increase in safety knowledge<br>• Decrease in behavior risk<br>• Boys have higher knowledge and higher exposure to risk than girls<br>• Improvements in knowledge and behavior both for boys and girls<br>• Improvements in knowledge and behavior both for farm residents and non-farm residents<br>• Improvements in knowledge and behavior at all target age levels, 8-13 years old |
| McCallum et al[26] | Using data from the parents, coordinators, and adult volunteers, reported on the impact of the safety day beyond the direct effect on children who participated. | • Parents are satisfied with experience, would recommend it to others, and believe it helps make children safer<br>• Volunteers learn safety information and plan to make safety-related changes<br>• Volunteers say it was a rewarding experience and would participate again<br>• Children and adult volunteers disseminate information to community<br>• Parents report safety-related changes in the home<br>• Safety day camp enhances safety awareness in the community and contributes to community cohesiveness |
| **B. McCallum, DM** | *Purpose*: NIOSH grant to evaluate effectiveness of farm safety day camps, 2001-2004<br>Quasi-experimental design with camp participants and non-participants.<br>*Sample*: 621 randomly selected children from randomly selected sample of 28 Progressive Agriculture Safety Days in 2002, and 413 non-participants sampled from the same or nearby communities, parents of participants and non-participants, safety day coordinators.<br>*Procedures*: Safety day participants completed written pretest, written posttest, 3-mo follow-up telephone, and 12-mo follow-up telephone interview. Non-participants completed the pretest, 3-mo, and 12-mo follow-ups. Parents were interviewed by telephone at the 3-mo and 12-mo follow-ups. Coordinators completed written questionnaires and telephone interviews. | |
| McCallum et al[23] | Using data from the children who participated in the safety day camps and the non-participating comparison group, reported on the knowledge and behavior changes from pretest to posttest and 3-mo and 12-mo follow-ups. | • Increase in safety knowledge for participants and comparison group, but greater for participants<br>• Knowledge gain was sustained at the 3-mo and 12-mo follow-ups<br>• Increase in reported safe behaviors for participants and comparison group, but greater for participants<br>• Decrease in injuries for participants, no change for comparison group<br>• Increase in knowledge for all ages |
| McCallum et al[30] | Using information from coordinators on the various camp characteristics, reported on the knowledge and behavior changes as related to these aspects of the context. | • Positive outcomes across the many variations in camp characteristics, including number of sessions, length of sessions, size of groups, type of event (school-based, community-based) |
| **C. Reed, DB** | *Purpose:* NIOSH grant to evaluate effectiveness of farm safety day camps, 2001-2004<br>*Sample*: 1,325 participants from 6 Farm Safety 4 Just Kids camps in 5 states. Two hundred and seventy-three of these children and their parents completed follow-up surveys. Sixty- nine instructors and 5 camp coordinators provided field data.<br>*Procedures:* Participants completed written pretest the day before camp and posttest immediately following the camp. A subset of children and their parents were interviewed by telephone at 1, 6, 12, and 18 mo after participation. Video and ancillary data were collected at each camp to assess quality of the instruction and children's responses to the instruction. Instructors completed a written questionnaire. Camp coordinators provided field data to determine camp influence on the larger community and to assess prevalence of serious child agricultural injury in their communities following the camp. | |

Continued

Table 1 Continued

| Project/Paper | Purpose and Methodology | Conclusions |
|---|---|---|
| Reed et al[21] | Evaluated effectiveness of FS4JK camps in improving knowledge of selected farm safety units, comparing pretest and posttest scores. | • Increase in knowledge both for boys and girls, girls higher than boys<br>• Increase in knowledge both for farm and non-farm residents<br>• Increase in knowledge for all ages |
| Claunch & Reed, 2004[22] | Reported on 144 children who completed the questionnaire at the final time point. | • Knowledge increases retained up to 18 mo<br>• Increase in knowledge for all ages |
| Popielarczyk et al[24] | Reported the results from the 1-mo follow-up survey of 243 children who reported living or working on a farm and their parents. | • Changes in safety behavior reported at 1-mo follow-up<br>• Virtually all farm families believed camp effective for increasing knowledge and changing behavior |
| Reed et al[25] | Grant final report. Examined changes in knowledge, attitudes, and behaviors toward farm risk based on a cohort of children who attended a farm safety day camp. Assessed parents' attitudes and behavior and the effect of the camps on the local community. | • Both farm and non-farm children increased their knowledge, and knowledge was retained over the length of the study.<br>• Nearly all parents reported that children talked about safety knowledge and sparked changes in family behavior<br>• No change in injuries from baseline to 18-mo follow-up<br>• Instruction varied, but overall it was age-appropriate |
| Reed et al[27] | Assessed differences in knowledge gain by farm residency status and gender, comparing pretest and posttest findings. | • Increase in knowledge both for boys and girls, although girls had higher pretest and posttest scores than boys<br>• Increased knowledge both for farm and non-farm children, with non-farm children increasing more<br>• Strong findings in spite of variation in instruction across sites |
| Reed et al[29] | Investigated the characteristics of instructors at the farm safety day camps. | • Instructors vary in teaching experience, training, motivation, use of materials<br>• Most instructors have farm experience |
| Mazur et al[31] | Focused on instructional practices and analysis of interactions between instructor and students to assess the type and degree of students' engagement in lessons being taught. | • Instructors kept children at safety day from exposure to hazards on-site<br>• Instruction tends to be fast-paced, didactic, uses group recitation, uses props<br>• Overall, instructors meet objectives of increasing awareness of and recognition of risks |
| Reed[33] | Assessed safety-related changes made by children and changes in family behavior due to attendance at the farm safety day, based on 6-mo follow-up telephone interviews with parents. | • Parents report safety-related changes to child's behavior, family rules, or improvement to equipment or facilities |
| Claunch et al[16] | Combined results of Project A and Project C above to consider the role of children's farm safety day participation in influencing safety changes on the farm or in the home. | • Children become agents of change by sharing information learned<br>• Most parents say children talked to them about messages learned<br>• Most parents say they learned something from what the child discussed<br>• Parents make safety-related changes around the home or farm |
| D. Arnold et al[13] | *Purpose:* Assessed exposure to risk, injuries, and self-efficacy among a farm safety day camp population.<br>*Subjects*: 536 third graders who participated in a farm safety day camp, 466 parents of participants.<br>*Procedures:* Participants completed written questionnaires in class 8 weeks following attendance at the safety day. Surveys were sent home for the parents to complete. | • Farm residents have more exposure to hazards than non-farm residents<br>• Boys report more exposure to risk than girls<br>• Participants think they can follow safety rules<br>• Parents think camp was beneficial to child<br>• Some parents report improvements in safety behaviors<br>• Some parents try to replicate and reinforce safety lessons at home |

Continued

Table 1 Continued

| Project/Paper | Purpose and Methodology | Conclusions |
|---|---|---|
| E. Hughes & Hartley[20] | *Purpose:* Evaluation of Georgia Healthy Farmers Farm Safety Camp, 1992-1997<br>*Subjects:* 253 participants in a multi-day safety camp.<br>*Procedures:* Participants completed written pretest and posttest questionnaires immediately before and immediately after camp (1993-1997). In 1992 there was a mailed 6-mo follow-up questionnaire. For those attending more than once, pretest scores were compared to pretest from previous year to assess long-term effects. Farm injury surveillance data collected from 6 target counties. | • Positive immediate and long-term (1 year) increase in farm safety knowledge<br>• Anecdotal evidence that information was shared with family and friends<br>• Safer behaviors reported 6 mo after participation<br>• Decline in childhood agricultural injuries in target counties<br>• Boys have greater knowledge on the pretest<br>• Increase in knowledge both for boys and girls |
| F. Baker et al[32] | *Purpose:* Qualitative assessment of the overall strengths and weaknesses of farm safety day camp programs.<br>*Subjects:* 26 individuals directly involved with farm safety day programs.<br>*Procedures:* Interviews with participants, literature search, and observations of 5 farm safety day event planning committees. | • Strengths:<br>Positive attention given to agricultural safety<br>Hands-on, interactive, fun programs<br>Children gain farm safety knowledge<br>Children talk to parents about farm safety<br>Brings community together to work toward common goal<br>• Weaknesses:<br>Lack of parental involvement<br>Hard to change behavior in 1 day<br>Expensive and time-consuming<br>Curriculum may be incorrect or age-inappropriate<br>Evaluation is difficult |

Children in all categories, regardless of gender, age, or farm residency, benefit from participation; and benefits occur across many variations in camp instruction. Furthermore, the benefits of the farm safety day extend beyond the children who participate to bring a heightened sense of safety awareness and knowledge to their families and communities.

## What We Need to Know

Although recent evaluation research has been successful in establishing many strengths and areas of effectiveness in farm safety day camps, there is more that needs to be known about the impact and value of farm safety days in order to identify ways to improve them and make them even more effective. Following are some of the issues and questions that still need to be addressed or clarified.

1. Although improvements have been found as long as 18 mo following participation in the safety day, the effects of the lessons learned and the awareness gained during farm safety day camps may wane from children and their family members over time. What can be done to strengthen the impact and extend the positive outcomes of the safety days, especially as children get older and naturally are exposed to greater risks?
2. It has been observed that the expertise of instructors and their use of curriculum vary, but it is not known the extent to which this affects the impact of the overall safety message. Positive impacts have been found across sites, despite this variability. The size of the effects may vary, however, from community to community, depending on these factors. How does the quality of the instruction affect the impact of the safety day on knowledge, behavior and injuries? Would the effects be stronger and more consistent if instruction were enhanced and standardized?
3. The limited evaluation research that includes comparison groups has demonstrated that similar improvements in knowledge occur over time for participants and non-participants, although the effects tend to be larger for the participants. Additional studies with strong comparison groups could help answer the question of why non-participants improve over time.
4. The changes found in safety knowledge and behaviors are modest. Further research could investigate whether more sensitive pretest and posttest measures would reveal larger changes in knowledge and behavior. Alternatively, further improvements to the curriculum and instruction delivery might produce larger changes.
5. There is a need for more behavioral data to support self-report measures. Collecting actual behavioral data would provide a more valid indication of safe behaviors and behavioral change.

6. Previous studies have reported very limited injury information. The difficulties of obtaining accurate pretest and posttest injury data, and the relative infrequency of serious injuries, make this a formidable task. However, collecting detailed information regarding childhood agriculture injuries among farm safety day participants and comparable non-participants would help answer the question of whether or not changes in knowledge and behavior result in the desired outcome of fewer injuries. The decline in injuries to children on farms over the past 15 years is heartening and coincides with the emphasis on farm safety and participation in farm safety days that increased dramatically beginning in the mid-1990s. At the same time there have been other changes in farming equipment and farming practices, as well as other intensive efforts to raise awareness and provide the farming community with information on safe practices for children. It would be helpful to have more direct evidence of the effectiveness of the farm safety days and other programs in achieving the ultimate goal of reducing injuries among those who participate.

Farm safety day camps are a popular activity in rural communities and schools, and the programs that offer such events are continuing to grow in the United States and beyond. They have a great deal of appeal due to their community-based approach, relatively low expense, and tremendous flexibility. They can be adapted to almost any community, and with good instructional materials can be implemented by non-experts. Anecdotally and quantitatively, they have been shown to have positive effects on the participants. With all the resources being used to conduct hundreds of farm safety days each year, answering some of the above questions and filling in some of the gaps in our knowledge about their effects is critical for determining ways to maximize the use of these resources and create the largest impact possible.

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