

Children and Safety on the Farm



PENNSYLVANIA STATE UNIVERSITY



College of Agricultural Sciences
Agricultural Research and Cooperative
Extension



Table of Contents

- 4** Understanding Development in Children
- 4** Keys to Prevention and Safety
- 7** Job Safety Analysis: The Basics
- 9** Conducting Effective Safety Audits
- 9** A Note for Parents: Supervision! Supervision! Supervision!
- 10** Conclusion
- 10** Safety Resources
- 11** References

Farming offers a unique opportunity for children and adolescents to learn the value of hard work, how to handle responsibilities, and how to set priorities. Traditionally, farming has been a family affair in which parents, grandparents, and older siblings help children to develop a sense of pride, a feeling of belonging, and the satisfaction of a job well done. But there are risks involved in farm labor.

A farm parent may argue, “I’d much prefer that the kids know their dad by spending time with him in the barn or in the field. That’s more important than being totally safe.” Does this parent mean to say that being in the field with dad is worth risking a fatal or near-fatal injury? Surely not. No parent wants to jeopardize the life of their child, but tragic injuries do happen on farms all over the country.

Children and adolescents account for about 20 percent of all farm fatalities, comprising a higher proportion of the total number of nonfatal farm injuries (National Committee for Childhood Injury Prevention, 1996). It is estimated that 27,000 children under the age of 20 who live on farms and ranches are seriously injured each year. When children who visit or work on nonfamily farms are included, the total annual injury toll is estimated to be 100,000. (About 800,000 children live in the households of hired farm workers and may work on farms with parents.) In Pennsylvania, 210 farm-related fatalities occurred between 1990 and 1994. Approximately 50 percent of these fatalities were classified as occupational fatalities, mainly due to farm production work. The other deaths were not occupational (i.e., not directly caused by farm production work). Instead, these fatalities were due to the farm “lifestyle” (i.e., leisure-related drownings, deaths of children who were playing in barns, etc.) or related to agricultural services, forestry, fishing, hunting, or trapping.

Unfortunately, there is little scientific evidence available to show what is an acceptable level of hazardous exposure for children and adolescents. Although discussions concerning the issues of farm safety and children are often controversial and emotionally charged, one point can be agreed upon—one death is too many if it is your child that is killed.

How can fatal and other serious injuries be minimized within an occupation in which children routinely work? Part of the answer lies in knowing and understanding a child’s stages of growth and development.

Understanding Development in Children

Injuries often occur when children are doing something beyond their mental, physical, or emotional ability. As children grow and develop, their play and work habits change dramatically. As a result, they are susceptible to certain types of accidents and injury. Understanding the developmental stages of children is a crucial factor in implementing appropriate safety procedures to prevent serious injuries and death.

Table 1 identifies growth stages of children, ages, developmental characteristics, types of injuries or fatalities that occur at each stage, prevention suggestions, and developmentally appropriate work tasks for each age group. The developmental characteristics, types of injuries or fatalities, and preventive strategies for each age group are more scientifically grounded or experienced-based than are the developmentally appropriate work tasks suggested. Task suggestions for the age groups may not exactly describe

tasks or be suitable for all children: Each child is a unique individual and may not perfectly fit within any grouped criteria or classification. On the other hand, it is normal for parents to overestimate the skills and abilities of their own children. The developmentally appropriate work task suggestions for each age group represent the best opinions of several child development and farm safety experts.

Keys to Prevention and Safety

As shown in Table 1, physical readiness is an important factor in a child's ability to handle certain tasks; however, mental, emotional, and social development play equally important roles in the level of capability and readiness for certain tasks. The responsibility of parents (who usually are the main safety trainers on family farms) to properly supervise and assign tasks becomes even more difficult as children and adolescents develop, because they mature at different rates. A child of 10 or 12 years may have the physical strength to drive a tractor—and may even be responsible enough to do

so—but if a dangerous situation suddenly arises, the child may not possess the cognitive ability to perceive and then quickly react to a crisis. Few children under the age of 14 can anticipate or handle danger. Since parents ultimately are the decision-makers, they need to be aware of how children develop before assigning them certain chores or work. A child may not be ready to handle the whole job, but a parent can separate it into parts that a child could handle. This type of separation activity, where guidelines are made for each child to follow, can involve the entire family.

Farm parents also need to “practice what they preach” by setting a good example and practicing safety in their own day-to-day activities. This can be difficult, since adults are so used to their daily work and routines that they can forget how complicated the job can be for a young person! Parents need to recognize and compensate for their own weaknesses as teachers. One of the best ways parents can do this is to use tools like Job Safety Analysis (JSA).

Table 1. Child development and appropriate work tasks

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
Birth–4 (infant/toddler/preschooler)	<ul style="list-style-type: none"> ■ Rapid growth, beginning motor skills development ■ Has balance problems, slow reaction time ■ Is curious, exploring ■ Is fascinated by movement ■ Has illogical or “magic” thinking ■ Is very energetic, releases tension by playing, even when exhausted ■ Is self-centered but interested in group activities 	<ul style="list-style-type: none"> ■ Falling from tractors or heights, such as ladders ■ Ingesting poisons ■ Being kicked or trampled by animals ■ Being run over by tractor ■ Drowning in ponds or manure pits 	<ul style="list-style-type: none"> ■ Never have a child as an extra rider. ■ Use strong physical barriers such as locks and fences around ponds and manure pits. Lock up chemicals. ■ Store ladders out of sight and reach. ■ Provide a fenced-in play area away from farming activities. ■ Provide maximum supervision at all times because of small children's poor coordination, high energy, and lack of fear. 	<ul style="list-style-type: none"> ■ None. Children this age should not be exposed to work hazards.

(continued)

Table 1. continued

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
5–9 (preschooler/ early elementary school age)	<ul style="list-style-type: none"> ■ Is learning to use small and large muscles—slow, steady growth stage ■ Has poor hand-eye coordination ■ Tries to master more complex skills ■ Operates with concrete facts, not capable of abstract ideas/thinking ■ Wishes to appear competent; seeks parental approval ■ Wishes to take on tasks without adult supervision ■ Is discovering that parents make mistakes, are human ■ Rarely follows through on a task—not yet ready for responsibility 	<ul style="list-style-type: none"> ■ Slipping and falling from tractors, trucks, or heights ■ Becoming entangled in augers, other machines ■ Suffocating in grain ■ Being kicked or trampled by animals 	<ul style="list-style-type: none"> ■ Set rules. ■ Discuss safe behavior with children. ■ Assign and closely supervise chores. ■ Talk openly about types of injuries and consequences. ■ Never assign intense, physical chores—they can lead to exhaustion. ■ Play games (with adult supervision) that focus on farm safety issues. ■ Use JSA. 	<ul style="list-style-type: none"> ■ Tasks of short duration that do not require hand-eye coordination ■ Projects with hand tools, not power tools ■ Help with watering plants and feeding small animals, such as pets or orphaned baby animals ■ Collect eggs
10–13 (middle school age/ early teen)	<ul style="list-style-type: none"> ■ Is growing at a steady rate—approaching puberty; boys grow more quickly than girls ■ Small muscles are developing rapidly ■ Has same coordination as adults but lapses of awkwardness are common ■ Has greater physical and mental skills ■ Desires peer and social acceptance ■ Wishes to try new skills without constant adult supervision ■ Signs of independence emerging ■ Success important for selfconcept 	<ul style="list-style-type: none"> ■ Becoming entangled with machinery ■ Hearing loss from exposure to noisy machinery ■ Injuring head or spine in motorcycle and all-terrain vehicle accidents ■ Extra rider falling from tractor or other equipment 	<ul style="list-style-type: none"> ■ Potentially the most dangerous age because of constant risk taking and ease of distraction and clumsiness—never mistake a child’s size for ability to do work! ■ Enroll child in bike safety classes; always require helmets. ■ Set clear and consistent rules; discuss consequences and rewards. ■ Provide specific education on farm hazard prevention. ■ Plan increases in chores and responsibilities. ■ Start with low-risk tasks; give more responsibility for follow-through with less supervision. ■ Use JSA. 	<ul style="list-style-type: none"> ■ Hand raking, digging ■ Limited power tool use (supervision); hand tools better ■ Operating lawn mower (push mower, flat surface, under supervision) or garden tractor ■ Handling and assisting with animals

(continued)

Table 1. continued

Growth stage	Developmental characteristics	Causes of deaths/injuries	Preventive strategies	Developmentally appropriate work tasks
13–16 (adolescent/young teenagers)	<ul style="list-style-type: none"> ■ Is growing rapidly and changing physically; can be an uneasy time ■ Girls growing faster than boys ■ Has moved from concrete thinking to abstract; enjoys mental activity ■ Can find solutions to own problems but still need adult guidance ■ Feels need to be accepted by peers ■ Resists adult authority ■ Feels immortal 	<ul style="list-style-type: none"> ■ Hearing loss from exposure to loud machinery ■ Head and spine injuries from motorcycle or all-terrain vehicle accidents ■ Machinery rollover/roadway accident ■ Amputation due to power take-off (PTO) entanglement 	<ul style="list-style-type: none"> ■ Judge size and age to measure maturity for tasks. ■ Be consistent with rules. ■ Provide education from peers with farm injuries. ■ Provide all-terrain vehicle training, protective gear. ■ Become involved in 4-H and FFA safety projects. ■ Use JSA. 	<ul style="list-style-type: none"> ■ Still needs adult supervision but ready for more adult jobs such as equipment operation and maintenance ■ Gradually increase tasks as experience is gained ■ Manual handling of feed and feeding animals ■ Can operate a tractor over 20 PTO horsepower or connect/disconnect parts to or from tractor at ages 14 and 15 after the completion of a 10-hour training program ■ Can assist with and operate (including stopping adjusting, and feeding) the following after completing a 10-hour training program: cornpicker, cotton picker, grain combine, hay mower forage harvester, hay baler, potato digger, mobile pea viner, feed grinder, crop dryer, forage blower, auger conveyor, the unloading mechanism of a nongravity-type self-unloading wagon or trailer, power post-hole digger, power post driver or nonwalking rotary tiller
16–18 (middle/older teenage)	<ul style="list-style-type: none"> ■ Awkwardness overcome, mastery of small and large muscles basically complete. ■ Knows abilities, moving further away from family and into community as independent person ■ Feels immortal ■ May act like child one day, adult the next ■ Rebellion, risk-taking, aggressiveness typical behaviors ■ Consistent treatment from adults important ■ Needs independence and identity ■ Has increased sense of adult responsibilities, thinking of future ■ May experiment with drugs or alcohol 	<ul style="list-style-type: none"> ■ Same as adult risks: respiratory illness, hearing loss, muscle/bone injuries, rollover from tractor, machinery entanglements ■ Additional risk if experimenting with or under the influence of drugs and/or alcohol 	<ul style="list-style-type: none"> ■ Provide rules regarding drugs and alcohol; open communication. ■ Reward for accepting adult responsibilities. ■ Serve as role model—teach younger children farm safety. ■ Parents may still have cause for concern with recklessness and risk-taking and may work side-by-side with young adult until absolutely ready. ■ Use JSA. 	<ul style="list-style-type: none"> ■ May be ready to work with tractors, self-propelled machinery, augers, elevators, and other farm equipment, but must earn this responsibility. Should be trained, educated, and supervised at regular intervals.

Job Safety Analysis: The Basics

Job Safety Analysis (JSA) is a method that helps parents find job safety hazards and eliminate or minimize them by providing a written set of safe job-task steps for children before the job is performed. If properly constructed and used, the job's JSA form will remind children to do their

work correctly and safely each time, helping them to develop strong safety habits while they perform the tasks. In addition, the JSA form can remind parents or adults how to do a job safely, letting them set good examples for children. Figure 1 shows how to complete a job safety analysis form. Jobs that can be broken into a few simple and safe steps are most suitable for job safety analysis. Figure 2

shows how such a form might look when completed. The JSA form can easily be written on a sheet of paper or on a 5-by-7-inch card, and several of them, one for each different task, can be kept in a notebook or folder near where the job is done. In any case, remember that JSA forms can never replace good initial instruction and close supervision!

Figure 1. Procedure for completing the job safety analysis form

Type of job:		
Date:		
Personal protective equipment to be worn:		
Basic job steps	Potential hazards	Recommended action or procedure
<p>Break the job down into steps. Each of the job's steps should accomplish a major portion of the job. Everything related to one logical set of movements is part of each job step.</p> <p>JSA works best for jobs that can be broken into 4 to 6 steps.</p> <p>Be sure to list all steps even if a particular step may not be completed each time. For example, in hitching a wagon to a tractor, a jack stand may remove the need for aligning the tongue with the tractor drawbar. But because not all wagons will have a jack stand, include this step in the JSA.</p>	<p>Hazards are potential dangers. Oil on the floor is a hazard.</p> <p>Examine each step of the job to find and identify hazards—actions, conditions and possibilities that could lead to an injury.</p> <p>It is not enough to find the obvious hazards. It is also important to look at the entire environment and find every conceivable hazard that might exist.</p> <p>Be sure to list health hazards too. Even though harmful effects may not be immediate, they are still hazards. A good example of a health hazard is dust from moldy hay or silage that sets up a sensitivity to the mold.</p>	<p>Using the first two columns as guides, decide which actions are necessary to eliminate or minimize the hazards that could lead to an injury or occupational illness.</p> <p>List recommended safe operating procedures on the JSA form. Also list required or recommended personal equipment for each step of the job.</p> <p>Be specific. Say exactly what needs to be done to correct the hazard. A good example would be "lift, using your leg muscles." Avoid using general statements like "be careful."</p> <p>Give a recommended action or procedure that eliminates or minimizes every hazard.</p>

Figure 2. Example of a completed job safety analysis form

Type of job: Helping to hitch an implement (wagon, machine) to a tractor		
Date: June 15, 1997		
Personal protective equipment to be worn: Work boots with steel toe and insole, leather gloves		
Basic job steps	Potential hazards	Recommended action or procedure
Check the position of the implement's wheels.	Implement could roll when tongue is lifted by helper, causing a crushing injury.	Check that the wheels of the implement are blocked so that it cannot roll.
Check the position of the implement's tongue.	Helper can strain his back if the tongue is too heavy.	Use blocks to keep the tongue at hitching height; squat down and use legs muscles to lift rather than bending over and lifting with your back. Use the implement's jack stand if it has one or use a temporary jack if the tongue is heavy and the implement doesn't have a jack stand.
Have tractor driver back to within a few inches of the implement's tongue.	Helper can be crushed between the tractor and the implement if the tractor operator miscalculates and does not stop in time. Helper can be run over by the rear tractor tire.	Stand clear and outside (to the side) of the tractor and implement until the tractor driver stops the tractor. Use hand signals.
Helper moves in to align implement tongue and pin hole with tractor drawbar and pin hole.	Helper can receive crushing injuries to the hands or body.	Keep hands back from the drawbar connection point. Wear leather gloves. Tractor operator backs up in low gear and with low engine speed.
Insert drawbar pin to connect tractor with implement. Insert safety pin or attach safety chains.	Helper can be run over by the tractor or implement Helper can suffer a crushing injury to the feet if the implement tongue slips off of the tractor drawbar.	Tractor operator puts the tractor in park or sets the brakes before the helper drops in the hitch pin. Helper steps from between the tractor and implement before the tractor operator moves the tractor. Helper wears steel-toe work boots.

* Note: Your JSA form does not need to use complete sentences if you can make the meaning clear without them. We used complete sentences just to make everything clear for you in this example.

Conducting Effective Safety Audits

Another important way to promote safety with children is to conduct periodic safety audits of your farm and home. By targeting and correcting hazards, parents take a major step toward protecting their children from unnecessary tragedy. Farm safety inspection checklists and related information that can be used by parents and farm families for auditing purposes are available from county extension offices.

Some important factors to consider while conducting a farm safety audit are listed below. Children should be involved in the audit to increase their safety awareness and knowledge of injury prevention.

Think about past “close calls” or potential future situations that might cause injuries. Determine the factors that were or could be responsible for a near-miss and attempt to explain those factors to children who are mature enough to understand.

Practice good housekeeping. Be sure to safely store items that cause injuries, including tools, equipment, power cords, fence wire, and baler cord. Heavy objects such as tractor tires should not be propped against walls or fences because they could fall over and crush a child or adult. Always place the bottom rungs of fixed ladders out of reach of children or fit the ladders with barriers. Store portable ladders away from dangerous areas.

Don't create new hazards when storing items. Haphazardly stacked lumber or poorly stacked cut logs can topple and kill a small child.

Pesticides and other toxic materials like dairy pipeline cleaner should be kept in a locked storage area. Also secure treated seed and fertilizer.

Place appropriate warning decals on tractors, machines, grain bins, silos, wagons, and any other potentially hazardous item. Explain the significance of these warning symbols to children.

Maintain safety zones around buildings and structures. Some structures are extremely dangerous places for children. Special fencing and barriers need to be placed around or over these structures so that children cannot enter them. Dangerous areas include:

Silos: These are particularly dangerous because of gases and running machinery during the filling and unloading of silage and grains.

Grain bins: The grain inside can turn into “quicksand,” especially during bottom unloading. Many children have drowned in bins being unloaded.

Farm ponds and manure pits: These are potential drowning sites with gasses and low oxygen hazards. Always make sure that ponds and pits are inaccessible to children!

Barn hay-drop openings: Fractured skulls and deaths have been caused by falls through a hay-drop opening during play.

Children should be able to reach feed and water containers from outside an animal's pen or corral.

Regularly make time for family safety briefings that include instructions for handling and reporting emergencies.

A Note for Parents: Supervision! Supervision! Supervision!

Although performing a thorough safety inspection and Job Safety Analysis are important steps to prevent injuries and fatalities, appropriate supervision is still the best preventive measure. Small children must always be supervised. It is not enough to tell them to “stay away.” Young children want to be with their parents and often forget what they have been told when they see mom and dad working in the field or driving a tractor. Always remember that helping children learn is a slow process that requires patience and understanding—rules and instructions may have to be repeated each time a child performs a job or is in a potentially hazardous situation. Providing this kind of constant supervision and instruction is often difficult, though. Many farm parents hold jobs away from the farm, and there are times when parents must work to get the chores done. Accordingly, parents should anticipate the need for child care, determine how long that care will be needed, and make arrangements in advance.

As a child grows older, constant supervision becomes less necessary. However, providing supervision remains an important factor in encouraging smart, lasting, and safe work habits. Also, as children get older and are able to handle more substantial work, parents must be prepared to start them slowly, spending time to properly train and enforce safety rules.

Conclusion

Farming is not just an occupation but a way of life. A very high value is placed upon the traditions that farming families have created and maintained throughout many generations. Perhaps someday farming will become a less dangerous occupation rather than being one of the most dangerous. And maybe, someday, farm parents will no longer argue that “being with dad is better than being totally safe,” but instead say, “I’d much prefer that the kids know their dad by spending time with him in the safest way possible.”

Safety Resources

County extension offices have information and can answer a variety of questions about agricultural safety and health. Another source of information is the Penn State Department of Agricultural and Biological Engineering Agricultural Safety and Health World Wide Web site, where there are links to other safety organizations, programs, and agencies. The URL is http://server.age.psu.edu/dept/extension/Ag_Safety/.

Below are descriptions of two organizations that provide information, products, programs, and curricula on farm safety and health for youth. An additional source for obtaining general youth safety and health information has also been provided. All three organizations continually develop new materials, so it is a good idea to check with them to learn what is new.

Agricultural Safety and Health for Youth

Farm Safety 4 Just Kids (FS4JK), Earlham, Iowa

FS4JK is a grass-roots organization dedicated to promoting child safety on the farm. FS4JK develops videos, warning stickers, handout materials, and school assembly programs. They also design farm safety day camps. FS4JK established National Farm Safety Day for “Just Kids.” A local chapter of the national organization is in Lancaster, Pennsylvania. FS4JK’s catalog listing materials and prices is available from either the national office or the local chapter.

Contact Information:

Farm Safety 4 Just Kids, National Headquarters

PO Box 458
Earlham, Iowa 50072-0458
Phone: 515-758-2827
Fax: 515-758-2517
Web site: <http://www.fs4jk.org/>

Farm Safety 4 Just Kids

Attention: Sherri Keyser-Groff
St. Joseph Hospital
250 College Ave.
Lancaster, PA 17603
717-390-3801

National Farm Medicine Center Marshfield, WI

The National Farm Medicine Center is leading a public and private sector initiative to develop and implement a national action plan for reducing unintentional agricultural injuries to children younger than 18 years. Among other items, the Center has developed educational pieces on dairy cattle and horse safety.

Contact Information:

National Farm Medicine Center c/o Marshfield Medical Foundation

510 North St. Joseph Avenue
Marshfield, WI 54449
Phone: 715-389-9298
Fax: 715-389-4950
Web site: <http://www.marshmed.org/nfmc/projects/csnriprc/csnriprc.htm>
E-mail: nikolaic@mfdclin.edu

General Safety and Health for Youth

Pennsylvania Safe Kids Coalition

The Pennsylvania Safe Kids Coalition (part of the National Safe Kids Campaign) are grassroots-level volunteers and organizations dedicated to preventing injuries to children. The Coalition aims to raise the public's awareness of unintentional injuries, initiate public policy changes, educate parents and caregivers to provide a safe environment for children, help local coalitions provide problem-solving answers at the community level and safety education for children and youth. This group is an excellent source of information and materials that relate to safety issues and items like playground safety, bicycle helmets, car seats, etc.

Contact Information:

Pennsylvania Safe Kids Coalition

2578 Interstate Drive
PO Box 68525
Harrisburg, PA 17106-8525
Phone: 717-657-1222
Fax: 717-657-3796

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Prepared by Dennis J. Murphy, professor of agricultural engineering, and Karen M. Hackett, technical writer.

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