



AGRICULTURAL SAFETY AND HEALTH NEWS

2005 Farm Show

The 2005 PA Farm Show is history. By any measure it was our most successful event yet in terms of debuting new educational displays and demonstration projects. With considerable leadership by the PA Child Death Review Agricultural Safety & Health Subcommittee, and great support from the PA Department of Agriculture and others, a Safe Play Areas on Farms demonstration model was showcased (see page 3). Parents and others were surveyed to seek their views on risks and barriers regarding safe play areas.

We also debuted a 1/8 scale model John Deere 4020 tractor that is able to model safe and unsafe features. Exhibit visitors had a great time guessing: What Is Wrong With This Tractor??. Educators in Pennsylvania will be hearing more about both new educational efforts in 2005.

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Reading Ice

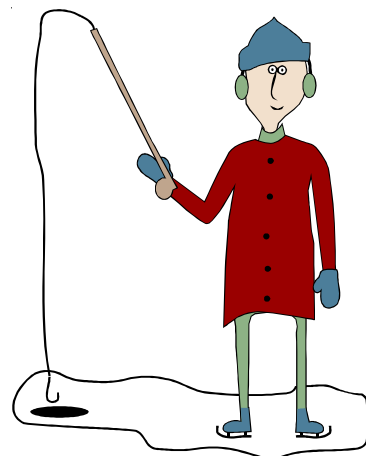


Ice is a complex formation and its strength involves factors such as temperature and temperature fluctuations, precipitation, wind, wave action, water depth, natural springs, water quality, and obstacles protruding through the ice. The quality of ice not only changes from day to day but throughout the day as well.

The only way to know the quality of the ice is to inspect the structure and thickness each time you cross onto it. This is done by drilling a hole and chipping at the ice every 10 feet. The quality of the ice is determined by how it reacts to the chipping. Chunks of ice produced by chipping indicate high density and a strong bond between the molecules. Flakes or thin layers indicate deteriorating ice with low density and that is porous which is dangerous.

The age of ice is one factor to consider. Although new ice is generally stronger than old ice, the very first layer of ice is usually formed with loose crystals; it is soft and porous which makes it weak.

Color is another indicator of the quality of ice. Clear ice is strongest and safest. It is formed over a long period of below freezing temperatures. The color may actually have a hint of blue or green due to the color of the water. Be aware that even clear ice next to the shores or in the middle of a lake or pond will be weaker and caution should be used in these areas. Gray or black ice is a sign of age and disintegration. It is honeycombed and saturated with water. It may be slushy. It is not safe to bear any weight load and should be completely avoided. Stay off slushy ice until it has been frozen for at least 24 hours straight.



Snow is another factor in terms of ice formation and conditions. Snow may thaw and freeze to form a layer of ice. Its low density and porous nature make it weak and dangerous. Color-wise, it may be white or opaque. It will flake when chipped which means it should be avoided. Snow can insulate ice to keep it from freezing as

well as create a melting area of ice just below the snow which will weaken the ice. Snow can also hide dangerous elements such as cracks, open water areas and weaknesses. Great precaution needs to be exerted when approaching and crossing snow ice.

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Winter Weather Protection

Let's get one thing out of the way; you do not lose most of your body heat through your head although keeping it covered in cold weather is still good advice.

Bodies generate and lose heat all the time as a means to maintain equilibrium. When the body can't maintain or generate enough heat then the body is at risk for frost nip, frost bite, and hypothermia. The potential outcomes of these risks range from discomfort to amputation to death.

Staying dry and warm is the key to avoiding these dangers of winter weather. Reducing the risks of winter weather are addressed through food, clothing (and shelter), and activities.

Food and water are likely the most overlooked elements of protection from winter weather. Inadequate nutrition and hydration directly and indirectly impairs the body's ability to produce heat. Reduced appetite, lethargy and impaired shivering response can result from dehydration. Individuals should also be aware that thirst is not an indicator of adequate hydration and so should drink plenty of fluids whether they feel thirsty or not. Without sufficient calories the body can not produce heat or adequately support physical activity. Physical activity can be a critical element for staying warm.

Cold weather activity may necessitate additional calories. As a diuretic, caffeine prompts the body to eliminate necessary fluids. Alcohol appears to produce a warming effect but this is misleading because it is due to a loss of needed heat through the skin. Alcohol, along with nicotine, adversely affects the body's heating/cooling system.

Most every one has heard about dressing in layers to stay warm. However, without a thorough understanding of the principals behind this prescription, individuals may not reap the full benefits and can even put themselves at risk for cold weather problems. Insulation is the most obvious principal of layering. Equally important is to keep moisture from accumulating inside the clothing either from within through sweating or from rain, snow, etc, penetrating from outside. Here's a look at the function of the individual layers.

The Inner Layer. This is the layer responsible for wicking away moisture from the skin. Cotton is very ineffective at this and should be avoided. Polyester is highly effective and a common component of long underwear.

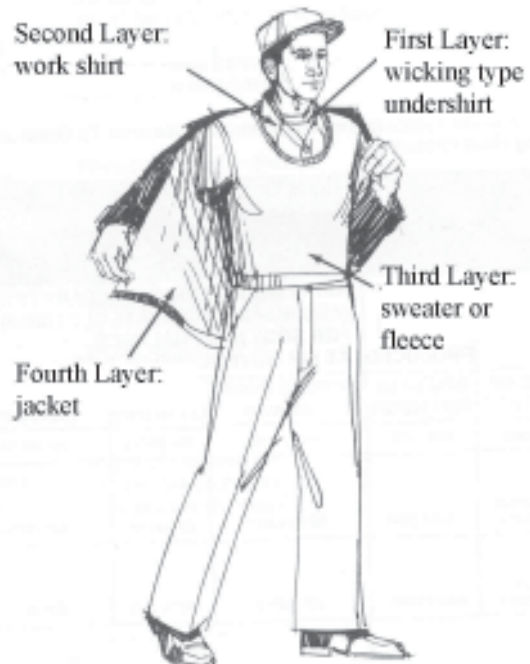
The Middle Layer. The primary function of this layer is for insulation although it too must be able to allow moisture to continue to move away from the body. Thickness and the ability to trap air determine how well a garment will insulate. This "layer" is most effective if comprised of multiple layers rather than one thick one. In part, this lets you respond to different levels of activity.

The Outer Layer. This is the first stand against the elements—wind, rain, snow. Like the middle layer, it must also be able to allow moisture to continue to move away from the body. These functions are can be accomplished through both the fabric, e.g., Gortex, and construction, e.g., "pit zippers."

Selecting garments for cold weather should take into account the level and types of physical work involved and the environmental conditions. Comfort should not be overlooked. Hoods, collars, sleeves, pockets, zippers, and the length and coverage of garments are all important elements to look at carefully. Be aware of elements that are designed more for style such as small zippers that can not be operated with gloves or mittens or coats too short that expose the waist and do not cover the seat. Also, any clothing that constricts will hinder blood flow and increase conductive cooling.

It is important to utilize the abilities of cold-weather garments while working and resting as well as maintain upkeep of them to gain full effectiveness. When beginning work, it may be optimum to shed a layer or two in anticipation of warming up and sweating through work. The extra layers can then be put back on when finished or resting to provide insulation. They are also likely to be more comfortable due to the lack of moisture. Garments must be kept clean as they can loose up to 50% of their insulating value quite quickly otherwise.

Adapted from the presentation *Cold Weather Clothing presented at the Winter Wilderness Medicine Conference, Feb. 13-18, 2003 by Gordon G. Giesbrecht, Ph.D. and Nutritional Advice for Operations in a Cold Environment, U.S. Army.*



Safe Play Areas on Farms

An exhibit demonstrating safe play areas on farms was presented at the 2005 Pennsylvania Farm Show. Examples of simple, inexpensive equipment and activities were shown along with educational information. For more information contact Vick Zittle at Pennsylvania Academy of Pediatrics (800-337-2227; vzittle@paaap.org) or psuash@psu.edu.

The exhibit was sponsored by the Pennsylvania Child Death Review Team Agricultural Subcommittee. Co-sponsors include agencies and organizations with representatives on the committee: American Trauma Society, Pennsylvania Department of Agriculture, Pennsylvania Department of Health, Penn State Agricultural Safety and Health, Penn State Agromedicine, Pennsylvania Office of Rural Health, Penn State Pesticide Education.

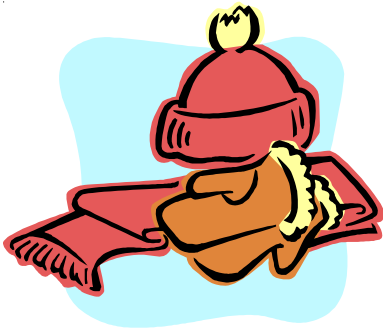
Development of the Safe Play Areas on Farms exhibit was guided by the publication, "Creating Safe Play Areas on Farms", published by the National Children's Center for Rural and Agricultural Health and Safety, 1-800-662-6900.



Recycled tractor seat and scrap lumber can be fashioned into a riding play area equipment.



Balance beam is great for improving coordination and concentration skills.



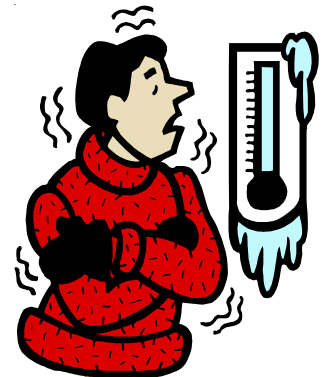
COLD WEATHER YOUTH

Cold weather safety for youth follows the same guidelines as those for adults—good nutrition, hydration and layered clothing. It is just as important to choose clothing in accordance with the type of activity and the weather conditions for youth as it is for adults. There's a difference between riding horses and riding an ATV and both of those are likely to be different than working in the barn. Setting limits and teaching them the warning signs of danger can be important elements of keeping cold-weather dangers at bay.

Set limits to the amount of time spent outside. This can vary greatly from a half hour to a few hours depending upon age and weather conditions such as wind chill and how wet it is. Have them return to the house or other shelter to warm up and refuel with warm beverages and a snack. Having a buddy system is always a good idea to use whenever possible. As at any time of the year, if working, young people should be given specific jobs that match their abilities. Whether playing or working, some level of supervision is appropriate depending upon their age.

Prepare them to know the symptoms of frostbite and hypothermia and what they should do if they suspect either one. Frost bite is caused by ice crystals forming in the cells of the skin. The earliest symptom of frostbite is tingling—the “pins and needle” sensation. This is followed by a sharper pain and numbness. Frost bite requires immediate attention as tissues may experience permanent damage. Although tempting, the affected area should not be heated with rubbing, hot water or other direct heat source. Each of these can cause further damage. The area should be warmed gradually and covered with sterile dressing. Medical attention should follow.

Hypothermia is when the overall temperature of the body falls below approximately 97 degrees or lower. The lower the body temperature falls the greater the dangers. Shivering is a sign that the body is getting too cold and is a first line defense in warming the body. Physical activity is also useful to warm up. However, if these do not succeed then the person is likely to be getting hypothermia. The warning signs include the “umbles,” mumbling, grumbling, stumbling, and fumbling. These reflect changes in the ability to control movement and levels of consciousness. It is important to prevent further heat loss and to not try to re-warm the body in a hurry. Shelter, warm beverages (although nothing with caffeine or alcohol), and additional insulation are the best first responses. It is important to get medical help as quickly as possible.



Youth Safety
Youth Safety

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The strength and stability of river ice can never be truly assessed therefore it is important that crossing river ice only be done when absolutely necessary. In such cases cross where the water is still or shallow for the strongest ice. Avoid bends and drops in elevation where there are ripples and where there are rocks or other obstructions. Throwing a heavy rock or log onto the ice may provide some evidence of its thickness and strength.

Cracks normally form in ice and it is important to differentiate between wet and dry cracks for safety. Dry cracks are a sign of strengthening ice as the lower layers buildup from the bottom and the top expands. Wet cracks signal that the ice is cracked through to the water, a dangerous situation.

How thick does the ice need to be to be safe? The table below includes the general guidelines to use when determining the safety of any activity. If a load will be left on the ice for longer than two hours then multiply the weight load by 2. This is because the contact between the load and the ice can cause the ice to melt and weaken. Spread out the weight load with the heaviest loads being spread the greater distances. If the air temperature rises about freezing for six or more hours over a 24-

hour period the quality of the ice can be quickly compromised. Take this into account by multiplying the weight of the load that will be on the ice by 1.3 to find the inches of ice needed. An alternative is to wait for a hard freeze of more than 24 hours before going on the ice.

General guidelines for ice thickness and safe activities.

Ice Thickness*	Activity	Max. Weight
0-3	No activities	None
4-5	Skating, fishing	250 lbs
6-7	Snowmobile or ATV	1,100 lbs
8-11	Light truck or car	3,527 lbs
12-14	Medium truck	7,937 lbs

*Indicates inches of new, clear or blue ice, not old or deteriorating ice. If you are unsure of the condition of the ice stay off.

Adapted from *Ice Safety, Extension Factsheet, The Ohio State University.*

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