

Dairy worker safety in cold environments

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As the winter months approach, dairy owners should be reminded of the effects of working outdoors in cold environments. Cold may be an occupational health hazard for dairy workers who spend extended periods outdoors during the winter months.

Cow-calf caretakers, cow pushers, maintenance workers, parlor workers and other dairy workers may all be exposed to extreme cold conditions that may present hazards to their health and safety. This narrative presents an overview of the health hazards of working in cold environments and contains guidelines on how dairy workers can be protected.

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Direct cold-related health problems

Hypothermia is a drop in the body's internal temperature below 95°F, and is a threat in frigid weather. This is a medical emergency that can result in death.

Frostbite is when skin, muscle, blood vessels and nerves freeze and form ice crystals. Blood vessels become blocked with tissue debris that causes more damage. Frostbite is often irreversible and amputation is sometimes required. If the injured site heals, the victim may suffer from chronic pain or numbness, excessive sweating, abnormal skin color and joint pain. The feet, hands, ears, nose and cheeks are the most frequently injured sites.

Immersion foot occurs when a part of the body is covered with water or wet mud that is just above freezing. The area becomes chronically swollen, weak and sensitive to cold.

Chilblain involves red, swollen skin usually on hands and feet. Affected skin feels hot, tender and itchy after cold exposure.

Indirect cold-related health problems

Disease flare ups. Conditions such as arthritis and asthma can be made worse in cold environments.

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Injuries. Cold weather can decrease dexterity, mental skills, coordination and cause a general decline in performance that affects safety.

Strains and sprains. Working in cold weather can increase the risk of injuries to muscles and

tendons, such as low back strain.

Factors that increase cold hazards

The following factors could increase danger from cold environments:

Air movement. High wind exposure or strong ventilation moving through air.

Wetness. Skin, clothing or shoes from being wet with water, gasoline, alcohol, solvent or other liquid that evaporates.

Sweating. Wet skin, clothing or shoes from sweating.

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Underdressing. Exposed fingers, cheeks, nose, ears; uncovered head.

Over-dressing. Thick clothing, rather than layers; tight-fitting belt, clothing or shoes that restrict circulation; waterproof clothing that restricts evaporation.

Low activity level. Standing or sitting still, driving.

Contact with cold objects takes heat out of the body through conduction.

Being tired, hungry or thirsty. These keep the body from replacing lost heat.

Medical conditions, especially those affecting circulation, such as diabetes, underactive thyroid, heart disease and a history of frostbite.

Medications. Some medications such as tranquilizers, allergy medications and beta-blockers may cause drowsiness or decrease vasoconstriction.

Alcohol, caffeine, nicotine. Alcohol impairs judgment and reduces shivering. Caffeine increases urine production and blood circulation, both leading to a loss of body heat. Nicotine decreases blood flow to the extremities and raises the risk of cold injury.

Methods to prevent cold-related injuries

Monitoring temperature and air movement. Readings from temperature and air movement should be taken in all cold work areas at different times during the day.

Raise air temperature. The first line of defense against cold is to warm the environment. Warm air jets or radiant heaters can be provided for spot heating.

Use warming rooms. Heated break rooms should be made available to workers. The colder the temperature and the higher the wind speed, the more often special warm-up breaks should be taken in a warmed break room. Breaks should be at least 15-20 minutes to allow for re-warming. The onset of heavy shivering, frostnip or minor frostbite, the feeling of excessive fatigue, drowsiness, irritability or euphoria are indications for immediate return to the warmed break room.

Control effects of air movement. Wind can be blocked by wind shields and special wind-protective clothing can be provided to workers.

Stay dry. Heavy sweating will result in wet clothing. The work rate should be fast enough to keep warm, but not so fast to cause heavy sweating. Clothing that has become wet should be changed.

Wear loose-fitting, layered protective clothing. Selection of cold weather protection should be done in compliance with OSHA standards on personal protective equipment (PPE). These are 1910.132 for general requirements, 1910.136 for foot protection and 1910.138 for hand protection. Three layers of body, hand, foot and head protection should be used.

Protection should be loose fitting with at least three layers so as to trap air and provide insulation. At the same time, it is important that protection be permeable to perspiration. An inner layer of protection should be made of a wicking material such as cotton or polypropylene, which will help draw moisture away from the skin. A middle insulation layer such as wool, down, fleece or other material with loft will hold the body's heat without adding weight. An outer layer should provide for wind and water protection.

Protection from hands is important to prevent injury but also to maintain dexterity. The feet and toes should be layered with sock liners, woolen or polyester socks, then waterproof insulated boots. Hats, hoods and masks not only prevent frostbite to the cheeks, ears and nose but also conserve heat loss from the head. Forty percent of heat loss is through the head.

Have change of clothing for an emergency. In case of wetting or excessive sweating, a complete change of clothing, shoes, hat, gloves, etc., should be available.

Eat and drink well. Workers can prepare for work in the cold by eating a high calorie diet to maintain a larger reserve of stored energy. Dehydration or the loss of body fluids can be a problem in the cold. The intake of coffee, tea and cola should be limited.

Use buddy system. Workers in conditions under 10°F should be observed by a co-worker or supervisor. New employees should be allowed to get acclimated to the cold conditions.

Prepare for vehicle breakdowns. Workers who operate machinery should wear extra-warm clothing in the event of mechanical breakdown.

Worker education. Workers exposed to cold should receive initial and annual training regarding the health effects of cold exposure, proper re-warming procedures, recognition and first aid for frostbite and hypothermia, required protective clothing, the buddy system, vehicle/machinery breakdown procedures and proper eating and drinking habits for working in the cold.

Medical checkups. Workers should be checked by a physician to assure they are not suffering from diseases or taking medications that interfere with normal body temperature regulation or reduce tolerance for cold environments. **PD**

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