



Heat Stress - 10

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Heat stress results from the buildup of body heat generated by the muscles during work, and from heat coming from warm and hot environments. When the body becomes overheated, less blood goes to the active muscles, the brain, and other internal organs. Workers become weaker, tired sooner, and less able to use good judgment, all of which affect their ability to perform their job well. As strain from heat becomes more severe, there can be a rapid rise in core body temperature and heart rate.

Workers may not realize that this is happening because there is no pain. Mental performance can be affected with an increase in body temperature of two degrees Fahrenheit above normal. An increase of five degrees Fahrenheit can result in serious illness or death. The most serious of these illnesses is heat stroke.

Some of the effects of heat stroke can include confusion, irrational behavior, convulsions, coma, and even death. Heat stroke survivors can remain sensitive to heat for months with varying degrees of brain and kidney damage. More than 20 percent of people afflicted by heat stroke die. These include even young and healthy adults, since acclimatization resistance varies with every individual. An average of 500 people are killed each year in the United States by the effects of heat. Some other common effects of heat upon worker health include the following:

Heat exhaustion - This can result from physical exertion in a hot environment. Its signs are a mildly elevated temperature, pallor, weak pulse, profuse sweating, and cool, moist skin.

Heat cramps - Usually caused by exposure to high temperatures for long periods of time with excessive loss of body salt and moisture. Even if this moisture is replaced by adequate amounts of fluids, the loss of body salt can still be the lone

factor leading to cramps or exhaustion.

How to reduce exposure

Where engineering controls of heat stress are not practical or complete, another solution should be sought to keep the heat stress level of the worker within limits which will not lead to an increased risk of heat illness. Some preventative methods include the following:

- Scheduling hot jobs for a cooler part of the day
- Limiting duration of exposure time
- Enhancing the worker's heat tolerance by heat acclimatization and physical conditioning
- Training workers in health and safety procedures for work in hot environments
- Medical screening of workers to determine physical ability of those who have a low tolerance to heat extremes

Laws and regulations There are no specific laws and regulations governing heat stress. OSHA expects agri-cultural employers to evaluate and control heat stress, and to conduct employee training if necessary. EPA requires that pesticide handlers and early-entry workers get training on "prevention, recognition and first-aid treatment of heat-related illness."

The American Conference of Governmental Industrial Hygienists (ACGIH) - The ACGIH publishes industry guidelines which are used for testing heat exposure of the individual worker along with testing protocol to determine the heat load of clothing and environment.

Center for Agricultural Business

- Research Publications -

Guides/books/articles

Heat Stress Safety Guide for Agricultural Workers

An excellent guide that also lists suppliers of cooling garments and devices for evaluating stress and heat conditions. From the Ag Personnel Management Program, 1720 S. Maple Ave., Fresno, CA 93702. Phone: (209) 456-7285.

American Conference of Governmental Industrial Hygienists (ACGIH) -

Industrial Ventilation - A Manual of Recommended Practice

American Industrial Hygiene Association (AIHA) - Heating and Cooling for Man in Industry.

American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) - Handbooks published annually.

National Safety Council (NSC) -

Pocket Guide to Heat Stress

Bross, Michael. "Heat Emergencies." *American Family Physician*. Aug. 1994. Vol. 51.

Huston, Carol. "Preventing Heat Stroke." *Nursing* 93. July 1993. Vol. 23.

Caruthers, Alan. "Exertion Induced Heat Exhaustion." *American Family Physician*. July 1993. Vol. 46.