

# HEAT ILLNESS PREVENTION PLAN

## UNIVERSITY OF CALIFORNIA AGRICULTURE AND NATURAL RESOURCES INJURY AND ILLNESS PREVENTION PROGRAM

### Applicability

This attachment is intended to comply with California Code of Regulations Title 8, Section 3395, Heat Illness Prevention (May 2015). The heat illness prevention standard is applicable to any outdoor workplace, whenever environmental risk factors for heat illness are present. Environmental risk factors for heat illness are defined in the regulation as working conditions that affect the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun, and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.

In the course of their work duties, employees in the classifications listed below may be exposed to environmental risk factors for heat illness.

<u>4-H Community Education Specialists (CES)</u>	<u>Youth, Families and Communities Advisor</u>
<u>Master Gardener/Composter CES</u>	<u></u>
<u>Nutrition CES (physical activity education)</u>	<u></u>
<u>Agricultural CES</u>	<u></u>
<u>Horticulture and Small Farms Advisor</u>	<u></u>
<u>Livestock and Natural Resources Advisor</u>	<u></u>

### Written plans and procedures

Employers are required to have a written heat illness plan available at each outdoor worksite where heat illness procedures may be required. These written plans and procedures are reviewed with employees in training and pre-shift meetings.

The written plan shall include:

1. Procedures for provision of water and shade
2. High heat procedures
3. Emergency response procedures
4. Acclimatization methods and procedures

Employers shall implement effective emergency response plan and procedures including: ensuring that there is an effective means of contacting supervisor or emergency medical services at the worksite, ensuring proper first aid or emergency response to signs and symptoms of heat illness, ensuring that clear and precise directions to the work site are available to emergency responders, and (if necessary) ensuring that injured workers are transported to a place where they can be reached by emergency responders. If an electronic device will not provide reliable reception in the work area, alternative means of monitoring and communication with employees must be identified.

New employees must have close supervision by a supervisor or designee for the first 14 days of employment. Specific acclimatization methods and procedures must be described in the written plan.

## **Employer responsibility and worker rights**

Employers are responsible for monitoring weather conditions at the worksite and ensuring that heat illness procedures (as described in this plan) are implemented when required. Employees are free to exercise their rights under the standard without fear of reprisal or retaliation.

## **Provision of Water**

Clean, fresh, and cool potable water shall be readily available to employees as close as practicable to the worksite. Whenever environmental risk factors for heat illness exist, drinking water will be provided in sufficient quantities to provide one quart per employee per hour for the entire shift (at least 2 gallons per employee for an 8-hour shift). Supervisors are responsible to ensure that employees have an adequate supply of drinking water. Smaller quantities of water may be provided at the beginning of the shift if there are effective procedures for replenishing the water supply during the shift as needed to allow employees to drink at least one quart per hour. Employees are encouraged to drink water frequently.

## **Shade Up Provisions**

When the temperature exceeds 80 °F a shaded area will be provided that employees may use when they are suffering from heat illness symptoms or believe they need a recovery period (“cool-down break”) to prevent heat illness. When the temperature is less than 80 °F , shade must be provided in a timely manner if an employee requests a “cool-down” break. Supervisors are responsible to ensure that employees have access to a shaded area located as close as possible to work area. The shaded area shall be open to the air or ventilated and cooled and access shall be permitted at all times while employees are present. Canopies, umbrellas or other temporary structures may be used to provide shade, provided they block direct sunlight. The shade shall accommodate the number of the employees on break at any time for cool-down recovery or onsite meal breaks. Employees must be able to sit in a normal posture fully in the shade without having to be in physical contact with each other.

Individuals who take preventative cool-down breaks in the shade shall be monitored for signs or symptoms of heat illness, encouraged to remain in the shade, and not ordered back to work until at least 5 minutes have passed or signs and symptoms have abated. Employees who report signs and symptoms of heat illness must be provided first aid or emergency response as needed.

## **High-Heat Procedures**

When the outdoor temperature equals or exceeds 95 °F , employers shall ensure effective observation and monitoring of employees by one of the following means: direct supervision of 20 or fewer employees onsite, mandatory buddy system, regular communication with sole employee by radio or cellular phone, or other means of effective observation. One or more employees at each worksite must be designated and authorized to contact emergency services when needed.

Pre-shift meetings must be conducted before commencement or work to review high-heat procedures, encourage water consumption, and remind employees of their right to take cool-down rest breaks of no less than 5 minutes whenever needed.

Employee must take a minimum preventative cool-down break of ten minutes for every two hours of work above 95°F. Required meal breaks or other rest periods may serve as preventative cool-down breaks.

## **Acclimatization Procedure**

Acclimatization is the gradual exposure to work in hot conditions to allow a person's body to adjust to working in heat. Acclimatization is particularly important for employees who are returning to work after a prolonged absence, recent illness, or recently moving from a cool to hot climate. Acclimatization is also a concern during heat wave events where temperatures exceed 80 °F and are at least ten degrees higher than the average daily high temperature for the preceding days.

Employees who are newly assigned to a high heat area shall be closely observed by a supervisor or other responsible party for the first fourteen days of employment above 80°F. Acclimatization is fully achieved in most people within 4 to 14 days of regular work involving at least 2 hours per day in the heat. Best practices include finding ways to lessen the intensity of employees' work during a heat wave and during 2-week break-in periods of new employees. For heavy work under very hot conditions, a period of 4-10 days of progressively increasing work time is recommended, starting with about 2 hours work per day. For less severe conditions, 2-3 days of increasing work activity and duration are recommended.

## **Training**

All employees who may work outdoors in conditions where there are environmental risk factors for heat illness shall be provided training on the information contained in this plan, including recognizing and responding to the various types of heat-related illnesses. Employees shall also be reminded that they have the right to exercise their rights under the heat illness protection standard without fear of retaliation from employers. In addition to standard employee training, supervisors must be trained on provisions for monitoring employees and for anticipating weather conditions which trigger heat illness requirements. All employees must be aware of and able to implement emergency response procedures (as appropriate for their position).

Additional information about prevention of heat illness can be found at the following resources:

Cal/OSHA websites: <http://www.dir.ca.gov/dosh/HeatIllnessInfo.html>  
<http://99calor.org/english.html>  
<http://99calor.org/espanol/>

ANR EH&S website: <http://ucanr.edu/heatillness>.

## **Recognizing Heat Illness Risk Factors**

Environmental risk factors for heat illness include air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.

Personal risk factors for heat illness include age, degree of acclimatization, general health, water consumption, and use of medications, caffeine, or alcohol which can affect the body's water retention or other physical response to heat.

Supervisors must evaluate work conditions before sending employees to perform outdoor work in hot conditions. Typically, temperatures above 80 °F , especially with heavy physical work activities, would represent conditions where there is a risk of heat illness. Other factors, such as high humidity or work activities that restrict the body's ability to cool itself, such as protective clothing, could result in a risk of heat illness at lower temperatures.

The National Weather Service Heat Index guideline (attached) may be used to assess the environmental risk of heat illness, based on temperature and relative humidity. The Heat Index table categorizes the risk or degree of heat illness with increasing heat index values. Provision of water and shade as described above should be implemented whenever the Heat Index exceeds 80°F.

## **Identifying Heat Illness**

Heat illness is a group of serious and escalating medical conditions that can result from the body's inability to cope with a particular heat load, and includes heat fatigue, heat cramps, heat exhaustion, and heat stroke.

The National Institute of Occupational Safety and Health (NIOSH) publication *Working in Hot Environments* describes the symptoms and response measures for several types of heat illness, as follows:

### **Transient Heat Fatigue –**

Transient heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance. The severity of transient heat fatigue will be lessened by a period of gradual adjustment to the hot environment (heat acclimatization).

### **Heat Rash –**

Heat rash, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin.

### **Fainting –**

A worker who is not accustomed to hot environments and who stands erect and immobile in the heat may faint. With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain. Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting.

## Heat Cramps –

Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly thereafter, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs, or abdomen, but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

***CAUTION Persons with heart problems or those on a low sodium diet who work in hot environments should consult a physician about what to do under these conditions.***

## Heat Exhaustion–

Heat exhaustion includes several clinical disorders having symptoms which may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

In most cases, treatment involves having the victim rest in a cool place and drink plenty of liquids. Victims with mild cases of heat exhaustion usually recover spontaneously with this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.

***CAUTION Persons with heart problems or those on a low sodium diet who work in hot environments should consult a physician about what to do under these conditions.***

## Heat Stroke –

Heat stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, red or spotted. Body temperature is usually 105°F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

Any person with signs or symptoms of heat stroke requires immediate hospitalization. However, first aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment at a medical facility should be directed to the continuation of the cooling process and the monitoring of complications which often accompany the heat stroke. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

For more information, see the following documents on the ANR EH&S web site: [Protecting Workers from Heat Stress](#) and [Safety Note #20, Heat Illness Awareness](#).

Any employee who recognizes symptoms or signs of heat illness in themselves or in co-workers should immediately report this condition to their supervisor.

## Heat Index

About 237 Americans succumb to the taxing demands of heat every year\*. Our bodies dissipate heat by varying the rate and depth of blood circulation, by losing water through the skin and sweat glands, and as a last resort, by panting, when blood is heated above 98.6°F. Sweating cools the body through evaporation. However, high relative humidity retards evaporation, robbing the body of its ability to cool itself. When heat gain exceeds the level the body can remove, body temperature begins to rise, and heat related illnesses and disorders may develop.

The **Heat Index** (HI) is the temperature the body feels when heat and humidity are combined. The chart below shows the HI that corresponds to the actual air temperature and relative humidity. (This chart is based upon shady, light wind conditions.)

**Exposure to direct sunlight can increase the HI by up to 15°F.**

(Due to the nature of the heat index calculation, the values in the tables below have an error +/- 1.3F.)

HI	Possible Heat Disorder
80°F – 90°F	Fatigue possible with prolonged exposure and physical activity
90°F – 105°F	Sunstroke, heat cramps and heat exhaustion possible
105°F – 130°F	Sunstroke, heat cramps, and heat exhaustion likel, and heat stroke possible
130°F or greater	Heat stroke highly likely with continued exposure, death possible

Temperature (°F) versus Relative Humidity (%)						
°F	90%	80%	70%	60%	50%	40%
80	86	84	83	82	81	80
85	101	97	93	90	86	84
90	122	113	106	100	95	91
95		133	123	113	105	99
100			142	129	118	109
105				148	134	122
110						136

Temperature (°F) versus Dewpoint							
°F	55	60	65	70	75	80	85
80	80	80	81	83	84	87	
85		84	86	89	93	99	107
90			91	95	100	107	117
95				101	106	114	125
100					113	121	131
105						127	138
110						134	145

\* 10-year average of heat related fatalities from 1994-2003. U.S. Natural Hazard Statistics.

source: National Weather <http://www.nws.noaa.gov/os/heat/index.shtml> Last modified: August 26, 2011

## First Aid and Emergency Response

Employees who report signs and symptoms of heat illness must be provided first aid or emergency response as needed.

If signs of heat illness occur in an employee:

- Move the person to a shaded area for a recovery period of at least five minutes.
- Monitor their health by asking them how they feel or observing symptoms.
- Provide first aid as needed (cool-down methods, removal from heat, small sips of water).
- If the condition appears to be severe or the employee does not recover, then emergency medical care is needed.
  
- Emergency medical care shall be provided by the following method:
  - Call 911.
  - Be ready to provide emergency response personnel with clear and precise directions to work location (street names and addresses).
  - Notify your supervisor that emergency services have been called for an employee illness and provide any other incident information.

The following people are authorized to call for emergency services when needed:

Any CES or Advisor

Directions to worksite(s):

Locations vary.

Transport of employees from remote worksites:

Ill person will be loaded into best available vehicle and driven to a location accessible to emergency responders

Location of nearest hospital or urgent care center (for each worksite):

(must include address and phone number of facility near each worksite)

## How to Respond to Heat-related Emergencies

If workers report or supervisors observe signs or symptoms of heat-related illness, stop activity immediately. Take action while waiting for help. HEAT STROKE IS A MEDICAL EMERGENCY. CALL 911 immediately if a worker shows any signs of heat stroke.

<u>Illness</u>	<u>Symptoms</u>	<u>First Aid*</u>
<b>Heat stroke</b>	<ul style="list-style-type: none"> <li>• Confusion</li> <li>• Fainting</li> <li>• Seizures</li> <li>• Excessive sweating or red, hot, dry skin</li> <li>• Very high body temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Call 911</li> </ul> <p>While waiting for help:</p> <ul style="list-style-type: none"> <li>• Place worker in shady, cool area</li> <li>• Loosen clothing, remove outer clothing</li> <li>• Fan air on worker; cold packs in armpits</li> <li>• Wet worker with cool water; apply ice packs, cool compresses, or ice if available</li> <li>• Provide fluids (preferably water) as soon as possible</li> <li>• Stay with worker until help arrives</li> </ul>
<b>Heat exhaustion</b>	<ul style="list-style-type: none"> <li>• Cool, moist skin</li> <li>• Heavy sweating</li> <li>• Headache</li> <li>• Nausea or vomiting</li> <li>• Dizziness</li> <li>• Light headedness</li> <li>• Weakness</li> <li>• Thirst</li> <li>• Irritability</li> <li>• Fast heart beat</li> </ul>	<ul style="list-style-type: none"> <li>• Have worker sit or lie down in a cool, shady area</li> <li>• Give worker plenty of water or other cool beverages to drink</li> <li>• Cool worker with cold compresses/ice packs</li> <li>• Take to clinic or emergency room for medical evaluation or treatment if signs or symptoms worsen or do not improve within 60 minutes.</li> <li>• Do not return to work that day</li> </ul>
<b>Heat cramps</b>	<ul style="list-style-type: none"> <li>• Muscle spasms</li> <li>• Pain</li> <li>• Usually in abdomen, arms, or legs</li> </ul>	<ul style="list-style-type: none"> <li>• Have worker rest in shady, cool area</li> <li>• Worker should drink water or other cool beverages</li> <li>• Wait a few hours before allowing worker to return to strenuous work</li> <li>• Have worker seek medical attention if cramps don't go away</li> </ul>
<b>Heat rash</b>	<ul style="list-style-type: none"> <li>• Clusters of red bumps on skin</li> <li>• Often appears on neck, upper chest, folds of skin</li> </ul>	<ul style="list-style-type: none"> <li>• Try to work in a cooler, less humid environment when possible</li> <li>• Keep the affected area dry</li> </ul>

\* Remember, if you are not a medical professional, use this information as a guide only to help workers in need.