

## Heat Illness



## HEAT ILLNESS

### **Self-Assessment/Pre-Test**

*(to be completed before reading Heat Illness content)*

1. What causes heat illness?
    - a. overheating caused by working in a hot environment
    - b. the body sweating too much
    - c. loss of ability to self-regulate body temperature
    - d. all of the above
  
  2. What are the components of the heat index?
    - a. temperature
    - b. humidity
    - c. both a and b
  
  3. What can be done to prevent heat illness?
    - a. drink plenty of water
    - b. dress in light-colored clothing
    - c. take rest breaks
    - d. stay out of the hottest sun
    - e. be in good physical condition
    - f. pair up with a buddy while working in fields
    - g. all of the above
  
  4. Which of the following is NOT a common symptom of heat exhaustion?
    - a. clammy skin
    - b. extreme thirst
    - c. dry mouth
    - d. nausea
    - e. headache
    - f. rapid breathing
    - g. diarrhea
  
  5. Which of the following is NOT a common symptom of heat stroke?
    - a. slowed or stopped sweating
    - b. hot dry skin
    - c. rapid breathing
    - d. aggressivity
    - e. blood-shot eyes
-

Self-Assessment/Pre-Test: Heat Illness - 2  
(to be completed before reading *Heat Illness* content)

6. What steps should be taken if you find someone suffering from heat exhaustion (and still conscious)?
- move to cool, shady area
  - remove or loosen clothing
  - fan vigorously
  - spray with water or place wet cloths on body
  - have worker drink water
  - elevate legs
  - call 911 if vomiting or unconscious
  - all of the above
7. What steps should be taken if you find someone suffering from heat stroke?
- call 911 (emergency medical attention)
  - pack neck and groin with ice or wet cloths
  - wet all exposed skin
  - protect airway
  - all of the above
8. How much water should a farmworker drink each hour?
- only as much as he/she wants
  - approximately 2-4 cups each hour
  - it doesn't matter
  - 8 cups

Answers: 1(d), 2(c), 3(g), 4(g), 5(e), 6(h), 7(e), 8(b)

---

## HEAT ILLNESS

### Supporting information for outreach workers

#### **What is heat stress?**

Heat stress is the buildup of heat in the body generated by muscles during work and from heat due to environmental conditions such as high temperatures, humidity, sun exposure, air movement and the time of day. Heat illness is a general term to describe what happens to the human body as a result of heat stress. Even a slight increase above normal body temperature (98.6 degrees Fahrenheit) can cause signs and symptoms of heat illness. Heat illness is a continuum that starts with heat cramps, progresses to heat exhaustion and may end with heat stroke if no one intervenes. Of these, heat exhaustion and heat stroke are the most serious. Heat exhaustion occurs when the body sweats more than the amount of water consumed. Heat stroke results when the body loses its ability to control heat by sweating or self-regulating temperature. Children, the elderly and those that are strenuously exerting themselves are most susceptible to heat stress.

Others that are susceptible include newcomers to the hot environment. It takes two weeks to “acclimate” one’s body to the heat. This is especially important in North Carolina where we receive many H2A workers who are newcomers to our climate and often start to work fulltime immediately upon arrival. Acclimation should involve working half days with frequent rest breaks for the first week and gradually increasing to full days by the end of the second week. Individuals with a past history of serious heat illness are also more susceptible and should be encouraged to leave farm work and find occupations in cooler surroundings. NC’s growing use of H2A workers may be part of the reason our state accounted for 57% of all agricultural heat related deaths from 1992-2006.

Certain medications and illness can also make people more susceptible to heat illness. Diuretics (“fluid pills”) that are frequently prescribed for high blood pressure can cause someone to more easily become dehydrated and susceptible to heat illness. Uncontrolled diabetes often causes frequent urination which makes it much harder to avoid dehydration and heat illness.

#### **How does heat stress cause heat illness?**

Environmental conditions such as humidity, sun exposure, time of day and air movement may all contribute to heat stress on the body. Humidity combines with the temperature to create the heat index or “felt” temperature. High humidity can raise the “felt” temperature significantly. Direct sun exposure can also increase the air temperature by several degrees, and increase the heat exposure. The peak hours of sun exposure are during the middle of the day, which is typically when farmworkers are in the fields working. Air movement plays a factor in heat exposure and cooling as well, as a breeze or wind can assist in the evaporation of sweat from the body and aid in cooling.

As the body experiences heat stress, due to working and/or environmental conditions, less blood travels to the muscles, brain and organs because it is going instead to the skin to allow heat to escape the body. Workers get tired, weak, think less clearly, and are less alert. As the overheating of the body becomes more severe, there can be a rapid rise in body temperature and heart rate. Workers may not notice because these physical reactions to heat stress are not associated with physical pain.

---

Supporting information for outreach workers: Heat Illness - 2

An increase of only 5 degrees Fahrenheit in body temperature is enough to result in illness or death. Heat stroke can cause confusion, irrational behavior, convulsions, coma, and death. It can also cause kidney or brain damage. High increases in body temperature are associated with short term infertility in men and can be dangerous during the early phase of pregnancy.

**What are the signs of heat illness?**

Early heat illness may cause mild dizziness, fatigue or irritability, decreased work speed, decreased concentration and impaired judgment. At this stage, treatment would consist of loosening or removing clothing, resting in the shade for at least 30 minutes, and drinking cool water. The worker should NOT be left alone and should NOT return to work that day even after feeling better.

Heat cramps result in painful spasms in the legs, arms, or stomach muscles, heavy sweating and thirst, and may occur during or after hard work. Treatment should consist of loosening clothing, drinking lightly salted beverages, massage and resting in the shade. The worker should NOT be left alone and should NOT return to work that day even after feeling better.

Heat exhaustion causes some of the above signs and symptoms, and may be identified by the worker's pale or flushed, clammy, moist skin; fast pulse; excessive thirst; dry mouth; nausea; slurred speech; headache or fainting. Treatment for a conscious worker should include: removal to a cooler, shaded area; having the worker lie down with feet elevated above the chest; encouragement to drink as much water as possible; loosening or removing clothing; and splashing cool water on body. If the worker is vomiting, fainted or unconscious, call 911 for an EMT immediately and proceed to treatment for heat stroke. Otherwise, call 911 in 30 minutes if the worker is not improving. The worker should NOT be left alone. Even if he improves without medical care, he should NOT return to work that day, and not even the next day until being examined by a provider.

Heat stroke may be identified by the prior signs and symptoms, along with slowed or stopped sweating; rapid breathing; hot, dry skin; delirium, seizure or coma. Heat stroke often results in damage to vital organs including the heart, brain, central nervous system, liver and kidneys. Immediate treatment should consist of an immediate call to 911; removing the worker to a cooler, shaded area; removing the worker's clothes; wetting the exposed skin; packing the groin and neck with cool, wet cloths or ice; vigorous fanning; being cautious to protect the airway if the worker vomits (roll the worker onto his/her side to prevent the vomit from entering the lungs). The worker should obviously NOT be left alone. There is a 20-40% mortality rate associated with heat stroke. Fifteen percent of those that are fortunate enough to survive are left with permanent neurological damage. Thus, it is very important to teach farmworkers, crew leaders and growers about the early symptoms of heat illness and the appropriate emergent response to heat illness.

**Why is heat illness a concern for farmworkers?**

During the growing season, daily temperatures can easily reach into the 90s, and with the added humidity can cause a heat index well over 100 degrees Fahrenheit. The humidity can be especially high among rows of growing plants, causing farmworkers to feel a heat index exceeding that felt outside of the field. In addition, farmworkers often wear long-sleeved shirts and pants to protect them from other health hazards, such as pesticides and green tobacco sickness. The heavier clothing, raingear or protective clothing worn by

---

Supporting information for outreach workers: Heat Illness - 3

farmworkers to protect against exposure to pesticides and/or green tobacco sickness can inhibit cooling by restricting evaporation of sweat, thus allowing the body to overheat. For this reason, it is important for farmworkers to wear loose, light-colored clothing and a broad-billed hat to shade the body from the sun and help prevent heat illness.

**How can growers help prevent heat illness?**

Growers and crew bosses can help protect their workers' health by preventing heat illness. If growers and farmworkers are both educated about the environmental factors of heat stress, heat illness prevention strategies and the early signs and symptoms of heat illness, a life-threatening condition such as heat exhaustion or heat stroke may be prevented.

Growers in California are required to have documented education about heat illness for their workers. This is not a requirement in North Carolina.

- Growers can monitor environmental conditions on a daily basis, considering air movement, temperature, sun exposure, humidity, and possible exposure to pesticides (because of additional clothing and/or protective gear required). By following a simple formula, growers can account for these environmental factors in heat stress and adjust work practices as needed. The OSHA Heat App for Android (English and Spanish) and iPhone (English only currently) can help growers and crew bosses easily calculate the heat index and determine risk.
- Growers can manage work activities to help control risk of heat illness in farmworkers. By setting up rest breaks, rotating tasks, shifting times for heavy work and work that requires protective gear, reducing workloads and postponing non-essential tasks, growers can help protect employee health. The previously mentioned Heat App specifies how often breaks should be scheduled to avoid heat illness.
- Growers can establish a drinking water program. OSHA's minimum requirements for drinking water include: providing sufficient amounts of cool, potable water; providing single-use drinking cups or water fountains; and placing water in locations that are accessible to all of the workers. The Heat App also specifies how much each farmworker should drink per hour given the current heat index.

**Heat illness is preventable! How can farmworkers prevent heat illness? Farmworkers can:**

- Drink plenty of fluids (non-caffeinated, non-alcoholic fluids are much better at preventing heat illness).
  - Stay in good physical shape. People who are in good shape tend to tolerate heat better than those who are not in good physical condition.
  - Limit exposure to the sun and heat.
  - Take rest breaks.
  - Wear light colored and loose-fitting clothing to help stay cool.
  - Teach farmworkers the importance of using the buddy system to help ensure that all workers have help should symptoms of heat illness arise.
  - OSHA's current campaign summarizes it "Agua, Sombra y Descansos"
-

**How much water should a farmworker drink?**

Farmworkers need to replace fluids lost through sweating by drinking lots of water. On days when the heat index is less than 102, a farmworker needs to drink approximately one (1) gallon per day. This quantity is equivalent to drinking 2 cups of water every hour during an 8 hour workday. When the heat index is greater than 102, a farmworker needs to drink approximately 2 gallons of water during the workday or 4 cups of water per hour.

It is important to keep in mind that caffeinated beverages and alcohol may have a diuretic effect, causing the body to lose fluids through urination. For this reason, it is important to reduce the regular consumption of alcohol or caffeinated beverages and/or compensate by drinking even more water to remain adequately hydrated. Sports beverages (containing added sugar and salt or sodium) are okay to drink as long as the worker is not diabetic or hypertensive.

Workers can become hyponatremic if they over-replace water. Hyponatremia is a rare, life-threatening condition in which there is so much water in the body that the salt level is diluted in the blood. Low sodium levels can cause a clouding of consciousness, nausea/vomiting, lightheadedness, dizziness, and in severe cases, seizures, unconsciousness or death. To reiterate, this condition is rare, and dehydration is much more commonly seen than hyponatremia.

One gallon is equal to 128 ounces or four (4) quarts.

One quart equals 32 ounces or 4 cups.

There are 16 cups in one gallon.

---

**What is the heat index?**

The heat index is the “feels like” or apparent temperature. As the humidity increases, the temperature feels warmer than it actually reads on the thermometer because our bodies are less able to cool by perspiration and evaporation. This is because the air is already saturated with water and cannot absorb more. This is especially relevant for farmworkers because the relative humidity is higher among rows of growing vegetables than away from the fields. Because of this increased humidity in the fields, the ambient temperature feels higher for a farmworker than the weather forecast or thermometer indicates.

°F	90%	80%	70%	60%	50%	40%
80	85	84	82	81	80	79
85	101	96	92	90	86	84
90	121	113	105	99	94	90
95		133	122	113	105	98
100			142	129	118	109
105				148	133	121
110						135

  

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 likely, and heat stroke possible.
130°F or greater	Heat stroke highly likely with continued exposure.

Source: <http://www.crh.noaa.gov/pub/heat.php>. Accessed 21 June 2005.

**Is there an easy way to estimate the heat index?**

Heat index can be a confusing concept, and may seem elusive or overly mathematical. There is a way to estimate the approximate heat index simply by following these steps:

1. Begin with the air temperature.
2. Add (+) 13 degrees for full sun or (+) 7 degrees for partial sun
3. Add (+) 3 degrees for 40% humidity OR  
 (+) 6 degrees for 50% humidity OR  
 (+) 9 degrees for 60% humidity

By following this simple formula, individuals can estimate the heat index and have a better idea of the quantity of water that should be consumed during the work day. For example: a 90 degree sunny day with 40% humidity = 90 + 13 + 3 = 106 heat index. Farmworkers working in this heat index need to drink two (2) gallons of water to stay adequately hydrated.



## HEAT ILLNESS

### **Self Assessment/Post-Test** *(to be completed after reading Heat Illness content)*

1. What causes heat illness?
  2. What are the two components of the heat index?
  3. What can be done to prevent heat illness (6 possible answers)?
  4. What are common symptoms for heat exhaustion?
  5. What are common symptoms for heat stroke?
  6. What steps should be taken if you find someone suffering from heat exhaustion (and still conscious)?
  7. What steps should be taken if you find someone suffering from heat stroke?
  8. How much water should a farmworker drink each day?
-

## HEAT ILLNESS

### Self Assessment/Post-Test answers

1. What causes heat illness?  
[body creates more heat than it can give off, overheating caused by working in hot environment, body sweats more than the amount of water consumed, cannot regulate temperature, dehydration]
  2. What are the components of the heat index?  
[temperature and humidity]
  3. What can be done to prevent heat illness (6 possible answers)?  
[drink enough water, dress in light-colored clothing, take rest breaks, stay out of the hottest sun, be in good physical condition, pair up with a buddy to remember these points]
  4. What are common symptoms for heat exhaustion?  
[Clammy skin, very thirsty, dry mouth, nausea, headache, dizzy, weak, loss of judgment]
  5. What are common symptoms for heat stroke?  
[slowed or stopped sweating, hot dry skin, rapid breathing, aggressivity, sometimes coma]
  6. What steps should be taken if you find someone suffering from heat exhaustion (and is still conscious)?  
[move to cool, shady area; remove or loosen clothing; fan vigorously; spray with water or place wet cloths on body; have worker drink water; elevate legs; call 911 after 30 minutes if not improving, do not leave victim alone; call 911 immediately if vomiting or unconscious]
  7. What steps should be taken if you find someone suffering from heat stroke?  
[call 911, then follow steps above, pack neck and groin with ice or wet cloths, wet all exposed skin, protect airway]
  8. How much water should a farmworker drink each day?  
[approximately one (1) gallon per day if the heat index is under 102 (2 cups per hour); two (2) gallons per day if the heat index is over 102 (3-4 cups of water each hour)]
-

## HEAT ILLNESS

### Teaching objectives

*The facilitator and farmworker participants will discuss:*

1. What is heat illness?
    - a. general term to describe what happens to the body as a result of heat stress
    - b. may manifest as heat cramps, heat exhaustion, and heat stroke
    - c. children and elderly are most susceptible, but heat illness can be dangerous for anyone
  
  2. What are the risks and contributing factors for heat illness?
    - a. heat illness is a result of heat stress
    - b. heat stress is caused by a buildup of heat due to exertion and environmental conditions
    - c. environmental conditions include: sun exposure, time of day, air flow, humidity and high temperatures
    - d. heat index includes sun exposure, temperature and humidity
  
  3. How can heat illness be prevented?
    - a. limit exposure to the sun and heat
    - b. wear light-colored and loose-fitting clothing
    - c. stay adequately hydrated
    - d. take rest breaks in the shade
    - e. stay in good physical shape
  
  4. What are common symptoms of heat illness, and what is appropriate first aid for victims?
    - a. heat cramps:
      - symptoms - muscle spasms, thirst and sweating
      - treatment - loosening clothing, rest and rehydration
    - b. heat exhaustion:
      - symptoms - excessive thirst, sweating, nausea, headache, rapid pulse
      - treatment – removal to a cooler area, rehydration, loosening or removal of clothing, cooling body with water, lying down with feet elevated
    - c. heat stroke
      - symptoms – slowed or stopped sweating, rapid breathing, hot and dry skin
      - treatment – call 911, pack the neck and groin with ice, wet skin, protect airway
-

## HEAT ILLNESS

### Motivating/Learning Activity

*The motivating / learning activity is an opportunity to support knowledge acquisition and comprehension among participants on a given health topic. These activities should be interactive and should begin to engage farmworkers in critical thought about the application of health information.*

This is an opportunity to engage the group and to assess the comfort level and knowledge on the subject. You may find that the workers are very familiar with the topic and only require a review. Or, you may find that this topic is new or that there are misconceptions or mistaken ideas among the group. For this reason, it is a good idea to briefly note comments by the workers for further discussion.

A few suggested activities are:

- Cabbage game with questions related to heat illness, prevention, treatment, first aid, etc.
- Read Peligro Bajo El Sol (the fotonovela) aloud, invite questions from the participants
- Use photo of scene or symptoms and invite workers to describe what they see, what they perceive the problem to be
- Read lettuce or cantaloupe case studies (from *Farmworker News*) and follow-up with discussion of prevention and treatment
- Use jeopardy game to review specifics about heat illness (especially if the group seems familiar with the topic)
- Use experiential method to illustrate heat index (humidity plus temperature): on a humid day, the sweat doesn't evaporate and you feel hotter, whereas on a breezy day, the sweat does evaporate and you feel cooler; or consider geography – summer in New Mexico vs. summer in central North Carolina

## HEAT ILLNESS

### Empowerment Activity

*The goal of an empowerment activity is to develop skills, learn a new task, consider action to change one's situation, and / or begin exploring how to help oneself.*

This is an important opportunity to identify what the farmworkers can do to prevent heat illness themselves.

- Do they have access to water, coolers, light-colored clothing, opportunities to rest, brimmed hats?
- Can they use the buddy system to prevent injuries?

Bring bottles and/or cups that can demonstrate equivalences in liquid quantities. For cooler days, when farmworkers need to drink one (1) gallon, they should drink one cup every 30 minutes per 8 hour workday = 16 cups. On days when the heat index exceeds 102, they need to drink two (2) gallons which adds up to 4 cups per hour = 32 cups. So, if a water bottle holds 16 ounces (2 cups) then the worker needs to drink 8 (heat index less than 102) or 16 (heat index exceeds 102) bottles each day to remain adequately hydrated.

Teach heat index estimation:

- Start with the air temperature
- Add (+) 13 degrees for work in the full sun, add (+) 7 degrees for work in partial sun
- Add (+) 3 degrees for 40% humidity
- Add (+) 6 degrees for 50% humidity
- Add (+) 9 degrees for 60% humidity

Reality check – explain that coffee, colas or beer can cause urination which can lead to dehydration. Workers need to ensure they are drinking enough water or sports drinks (if not diabetic or hypertensive)

Teach first aid for farmworkers:

- Cooling strategies (move to cool, shady place; remove clothing; fan vigorously; use wet cloths; spray body with water; pack groin and neck with ice/wet cloths)
  - Give water to drink if conscious and not vomiting (do not add salt)
  - Shock (elevate feet)
  - If airway compromised (turn to side, ensure mouth/airway is cleared)
  - Call 911 immediately if unconscious or vomiting; call 911 in 30 minutes for other heat illness victims if not improving
-

## HEAT ILLNESS

### Sample Class Plan

Subject: Heat Illness

Date:

Time:

Topic: *What are the risks and contributing factors for heat illness?*  
(teaching objective 2 from heat illness module)

#### **Key points, information, skills or activities**

*As a result of this health education session, participants will:*

1. Differentiate between heat stress and heat illness.
2. Summarize that heat stress is the build-up of heat in the body due to physical exertion and environmental conditions.
3. Recognize that heat index accounts for sun exposure, air temperature and humidity.

#### **Teaching methods**

Brainstorming

Discussion

Using visual aids

Participatory reading of fotonovela

Cabbage game

Storytelling

#### **Materials and preparation needed**

Chart or board to record participants' ideas

Cabbage game prepared with relevant questions

Picture or drawing of worker in the fields suffering in the heat

Fotonovela

Heat index chart

Water containers labeled to indicate the quantity that needs to be consumed

Ex: a 16 ounce container that is labeled with [8x] to equal one gallon

#### **Supporting media**

Language and reading-level appropriate brochures or flyers to distribute

NCFHP approved content in case of questions

Sample Class Plan: Heat Illness-2

***Class Outline***

**To begin, invite participants to tell stories of their experiences with heat illness. What do participants already know? What would they like to learn?**

**1. Differentiate between heat stress and heat illness.**

- Heat stress is a combination of the physical effects of exertion and environmental stress on the body.
- Heat stress may lead to heat illness in some individuals.
- Heat illness may manifest as heat cramps, heat exhaustion and heat stroke.

***Learning activities***

-Discuss cause and effect with the participants. In this case, heat stress is the cause and heat illness the effect. They are not the same thing.  
-Read the fotonovela or a case study to participants. Have participants suggest the cause and the effect in the stories.

**2. Summarize that heat stress is the build-up of heat in the body due to physical exertion and environmental conditions.**

- Heat stress is due to physical exertion and environmental conditions.
- Environmental conditions that contribute to heat stress include the sun exposure, humidity, temperature, air flow, and time of day.

***Learning activities***

-Using a picture of a worker suffering in the heat, have the participants brainstorm causes for the worker's discomfort in the heat. List the responses on paper. Make sure all the common causes are listed by the workers.

**3. Recognize that heat index accounts for sun exposure, air temperature and humidity.**

- The heat index is the "felt" temperature. It is a combination of the air temperature, the humidity and the sun exposure.
- Farmworkers must adjust the amount of water they drink according to the heat index, so it would be very useful for them to understand how to calculate the heat index themselves.
- If the heat index is less than 102, farmworkers should drink at least one gallon of water per day.
- If the heat index exceeds 102, farmworkers should drink two gallons of water per day.

***Learning activities***

-Using the heat index chart, illustrate how humidity and sun exposure can increase the air temperature.  
-Relate the heat index to the farmworkers' hometowns. Ask whether their hometowns were humid, how it felt to work outside in the summer, whether it feels hotter here.  
-Teach workers how to approximate the heat index for themselves to know how much water to drink.  
-Illustrate the quantity of water that workers must drink with various sized water bottles.

---

Sample Class Plan: Heat Illness-3

**Suggested review activities (choose one or two)**

- play the cabbage game with a variety of questions to assess learning
- ask if there were any points that were unclear
- invite questions from the group
- distribute written/pictorial materials to reinforce the information learned



## HEAT ILLNESS

### Support for Learning Activities

**These are a few suggested questions for the cabbage game. Feel free to write your own questions in addition to or instead of these. If the question is true/false, have the worker or another participant restate the sentence so that it will be true.**

What is heat illness?

What are the two parts of the heat index?

What can a farmworker wear to protect against heat illness?

How much water should a farmworker drink each hour of the working day?

What else can a worker do to prevent heat illness?

Mild dizziness, fatigue and irritability are the earliest signs of heat illness. True or false?

What are the three steps that a farmworker should take if he/she notices these early signs?

What are the most common signs of heat exhaustion?

How do you treat heat exhaustion?

What signs/symptoms indicate a call to 911 for emergency help?

#### **List of suggested items for grab bag activity:**

Variety of clothing

Cola bottle

Bandana

Hat

Water containers

Fan

Picture of ice

Picture of shade tree

Cell phone

#### **List of follow-up questions for fotonovela, photograph or case study activity:**

Why did (character name here) get sick?

How did heat illness make (character name here) feel? What were the symptoms?

What could (character name here) have done differently to prevent getting heat illness?

What should you do if you feel you might have heat illness?

Do you have access to drinking water in the fields?

Do you have a brimmed hat to shade your face and neck from the sun?

Can you take breaks in the shade during the hottest part of the day?

Can you recognize the early signs of heat illness in your co-workers to prevent its progression to a more serious condition?

If using a photograph or case study to initiate discussion and workers identify other conditions besides the target health education topic, the facilitator may say: "That is one problem that \_\_\_\_\_ may experience, but that isn't the problem today. What other conditions/problems can cause \_\_\_\_\_ to look or feel this way?"

---

Support for learning activities: Heat Illness - 2

**Possible Jeopardy questions (with suggested point values):**

100-Humidity can increase the “felt” temperature. True or false?

100-A breezy or windy day can reduce the “felt” temperature. True or false?

100-What can a farmworker do to prevent heat illness? (six answers for 100 points each)

200-What are the two parts of the heat index?

200-What are the earliest symptoms of heat illness?

300-When should you call 911 for emergency help?

300-Why is drinking water important in preventing heat illness?

400-What can you do to help cool a co-worker suffering from heat illness?

400-How much water should a worker drink each day?

500-Alcohol and caffeinated beverages count toward the total water needed each day.  
True or false?

## HEAT ILLNESS

### Recommended Resources for Outreach Workers

#### Manual **A Guide to Heat Stress In Agriculture**

EPA

1993

44 pgs English

Agricultural employers

This manual helps employers understand what heat stress is, its causes and how to treat individuals suffering from the condition. The manual outlines a program to help employers deal with heat stress including training workers, acclimatizing workers, managing work activities, establishing a drinking water program, using special equipment and garments, and providing first aid to affected workers. Reports of four different cases of heat stress are illustrated to help employers get an idea of what the consequences may be. The poster provides a more succinct version.

Available at <http://1.usa.gov/1TzqhE2>

National Service Center for Environmental Publications (Free)

#### Fact Sheets/Posters/Training Materials **Campaign to prevent Heat Illness**

Occupational Safety and Health Administration (OSHA)

Spanish and English resources

Outreach workers, farmworkers

This compilation of heat stress education materials was adapted from a California campaign against heat stress. A wide variety of formats are used, including wallet cards, a smartphone app to calculate the heat index, posters, training guides for employers, and fact sheets. The materials emphasize prevention through water, rest, and shade, and also detail the proper ways to respond to farmworkers demonstrating symptoms of heat stress. These innovative resources could be useful in a variety of settings for both farmworkers and outreach workers, and are well worth reviewing.

Available online at <https://www.osha.gov/SLTC/heatillness/edresources.html>

#### Fotonovela **Peligro bajo el sol: Protegete, toma agua!**

Farmworker Health Alliance

2001

15 pgs Spanish

Farmworkers

This black and white fotonovela serves as a good teaching tool for use with farmworkers. Symptoms of heat exhaustion and heat stroke are illustrated in a narrative format, with emphasis given to appropriate actions and treatment should heat illness occur. The characters convey the message that heat illness is preventable and offer comprehensible depth in explaining prevention strategies. The message is simply written and empowering for farmworkers.

Available at [http://www.migrantclinician.org/files/Heat\\_Illness\\_Novela\\_Spanish.pdf](http://www.migrantclinician.org/files/Heat_Illness_Novela_Spanish.pdf)

---

Recommended resources for outreach workers: Heat Illness - 2

Telenovela **Novelas sobre el trabajo en el calor**

U.S. Agricultural Safety and Health Centers

2014

Spanish with English subtitles

Outreach workers, farmworkers

This YouTube playlist of 5 short telenovela-style videos (about 2 minutes each) reviews the core causes and symptoms of heat stress and methods of treatment and prevention in farmworkers. The videos include comprehensive information but remain engaging and accessible throughout. These videos would be useful in a health education session for farmworkers

Available online at

<https://www.youtube.com/playlist?list=PLY7XQBihZRNvezeSe7dCHgSlkoN9Nyvnr>

Educational materials **Heat Illness Prevention: Training Materials for Educators**

Pacific Northwest Agricultural Safety and Health Center

Spanish and English

Outreach workers, farmworkers

This webpage includes links to educational materials in a variety of formats. Highlights include a Jeopardy game PowerPoint, a body map of the symptoms of heat stress, and graphics on prevention methods and the different types of heat illness. The materials are written simply and are quite accessible to farmworkers. They could strengthen lesson plans for farmworker heat stress education sessions.

Available online at [http://deohs.washington.edu/pnash/heat\\_illness](http://deohs.washington.edu/pnash/heat_illness)

Newsletter **How can I get sick from the heat?**

National Center for Farmworker Health

Two columns, Spanish and English

Outreach workers, farmworkers

This newsletter contains four articles with practical information and advice on heat illness. Each article is written in a different format, ranging from a short telenovela to a case study of an aging farmworker who was hospitalized for heat illness. The case study could be a great discussion starter and the other articles are rife with helpful information.

Available online at

[http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom\\_themes/919123595410423472/files/2010HeatIllness.pdf](http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom_themes/919123595410423472/files/2010HeatIllness.pdf)

---

Recommended resources for outreach workers: Heat Illness - 3

Article **Debido al calor un trabajador sufre un desmayo**

Farmworker News Vol 10 Issue 3

2004

Two columns Spanish/English

Outreach workers, farmworkers

This case study relays the story of a farmworker who collapsed while packing lettuce in the field and was diagnosed with heat stroke. The case study is less thorough in setting the scene of the event, and goes into less detail regarding contributing factors to the heat stroke than the cantaloupe case study. It is followed by a brief discussion of actions that might have prevented the injury. It does, however, offer a good review of heat illness prevention. Like the preceding case study, this is best used as a springboard for discussion by reading it aloud with (or to) a group.

Available online at

[http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom\\_themes/919123595410423472/files/04\\_issue\\_03.pdf](http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom_themes/919123595410423472/files/04_issue_03.pdf) (page 4)

Article **Condiciones causadas por el calor**

Farmworker News Vol 8 Issue 2

Spring II 2002

Two columns Spanish/English

Outreach workers, farmworkers

This concise one page article outlines the symptoms of both heat exhaustion and heat stroke, as well as appropriate first aid treatment and preventive measures for the conditions. The tone of the article is informational and the practical prevention and treatment steps are empowering for farmworkers. Because the information is written with no supporting images, this educational piece may be inappropriate for non-native Spanish speakers or individuals with low literacy.

Available online at

[http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom\\_themes/919123595410423472/files/02-issue\\_02.pdf](http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom_themes/919123595410423472/files/02-issue_02.pdf) (page 3)

Article **Agricultor de melones muere de insolación**

Farmworker News Vol 7 Issue 3

Summer 2001

Two columns Spanish/English

Outreach workers, farmworkers

This case study tells the story of a farmworker who collapsed in a cantaloupe field and later died of heat stroke. The case study does a good job of presenting the scene, the factors that contributed to the farmworker's collapse, and the outcome of the situation. Following the case study is a brief discussion of actions that might have prevented the injury and subsequent death. This case study is likely best utilized as a platform for discussion by reading it aloud with a group.

Available online at

[http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom\\_themes/919123595410423472/files/01-issue\\_03.pdf](http://www.weebly.com/editor/uploads/3/8/6/8/38685499/custom_themes/919123595410423472/files/01-issue_03.pdf) (page 4)

---