Preventing Heat Illness in Agricultural Settings

A Review of State Measures to Address Heat in the Workplace

Center for Agriculture & Food Systems
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About CAFS

The Center for Agriculture and Food Systems (CAFS) is a research-based center at Vermont Law and Graduate School that produces original scholarly research in the field of food and agricultural law and policy to serve the broadest range of food system stakeholders.

With local, regional, national, and international partners, CAFS addresses food system challenges related to food and nutrition security and affordability, farmland access, food system workers, farm viability, local economies, and public health, among others. CAFS works closely with its partners to provide support and services and develop resources that respond to their needs. Through CAFS's Food and Agriculture Clinic and Research Assistant program, Vermont Law and Graduate School students work directly on projects alongside partners nationwide, engaging in innovative and practical work that spans the food system.

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I. Introduction

Heat stress is a serious, yet preventable, occupational hazard. It can lead to heat-related illnesses and physical injuries as the body struggles to regulate temperature during prolonged exposure to high environmental heat.[1] Even in milder temperatures, workers can experience heat stress when engaged in strenuous physical activity due to the body's creation of metabolic heat which then combines with environmental heat.[2] These conditions range from relatively mild (e.g., heat cramps, swelling) to moderate (heat exhaustion, fainting) and severe (heat stroke, which can be fatal).[3] Research using biometric devices has documented the connection between workers with core temperatures exceeding 100˚F and a high frequency of acute kidney injury, putting workers at risk of developing chronic kidney disease even without obvious symptoms of heat stress.[4] One study has shown that the risk of injury due to heat stress is higher in states without workplace safety standards to address heat exposure.[5]

Though heat exposure occurs across industries, **agricultural workers are particularly vulnerable and are more likely to die from heat-related stress than workers in other industries**.[6] Agricultural work often occurs in exposed areas with limited access to water and shade. Pressure to harvest crops quickly limits the opportunity to rest and recover as needed. Remote work locations can also make it difficult to access medical services quickly enough to provide critical aid. Given farmworkers' unique vulnerability to the effects of heat stress and the absence of federal workplace standards to address the issue, this resource focuses on state and local heat illness prevention rules relevant to agricultural workers. Its guidance, however, may be useful for general industry protections.

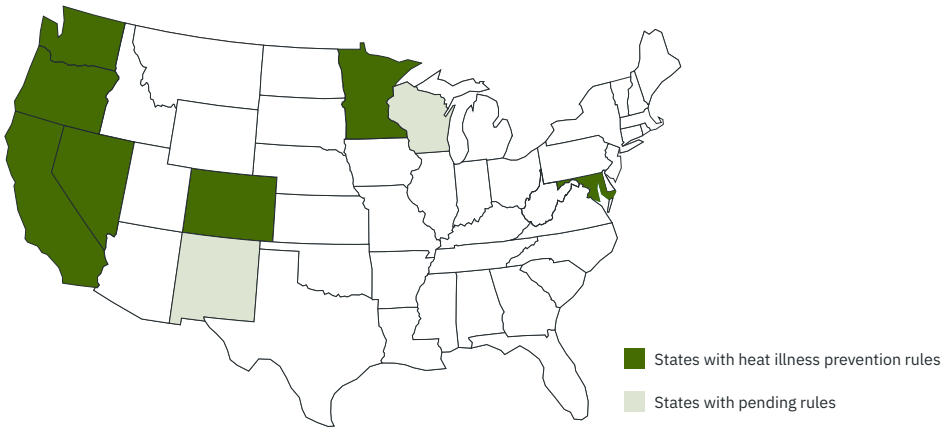
In August 2024, the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor issued a notice of proposed rulemaking and request for comments on the agency's proposed rule *Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings*.[7] As a new presidential administration transitioned into leadership, the rule remained pending. OSHA conducted public hearings on the pending rule in June and July 2025 and reopened the docket for additional comments from those who participated in the hearings.[8] While it is uncertain whether the agency will proceed with enacting a rule, some industry advocates have urged OSHA to move forward with a pared down version that is more business-friendly and flexible.[9] If OSHA moves forward, the final rule will likely differ significantly from the initially proposed version.

To view OSHA's proposed rule in its entirety, visit: *OSHA, Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings*.

For those concerned with worker health and safety, there are opportunities to enact protections at the state and local level. Federal OSHA standards provide a baseline for worker health and safety protections, which allows states to enact protections that exceed federal requirements. They can do this either legislatively or administratively in some cases. Several states have already developed their own standards, which can serve as a template for developing standards in other states. Lessons learned in the implementation of these standards provide further instruction on how to strengthen these laws moving forward.

The sections that follow aim to answer key questions that communities face when considering heat protection measures in their state:

- **How does a rule get enacted?** This section describes the process for enacting new rules.
- **What are the core components of a heat illness prevention rule?** This section describes the main elements common across heat illness prevention rules, notes some of the differences among existing rules, and makes recommendations.
- **What further protections can be pursued?** This section describes additional policies that will support the goal of preventing heat illness but either are less common among existing rules or would involve a policy change that likely falls outside the provisions of a heat illness prevention rule.
- **What could the text of a rule look like?** This section includes a template rule that communities and policymakers can use as a starting point for developing a draft proposed rule.



STATE HEAT ILLNESS PREVENTION RULES (*as of December 2025*)	
STATE	**RULES LOCATION**
California – Indoor	Cal. Code Regs. tit. 8, § 3396
California – Outdoor	Cal. Code Regs. tit. 8, § 3395
Colorado	7 Colo. Code Regs § 1103-15:3
Maryland	Md. Code Regs. 09.12.32
Minnesota	Minn. R. 5205.0110
Nevada	Nevada Regulation R131-24AP
Oregon	Or. Admin. R. 437-004-1131
Washington	Wash. Admin. Code § 296-307-097

For an evaluation of how well states are protecting workers from heat in the workplace, visit: Public Citizen, *Scorched States: A Report Card on State Laws Protecting Workers from Heat* (2024).

Pending Heat Illness Prevention Rules

At the time of writing, several states are considering new standards or amendments. New Mexico's Occupational Health and Safety Bureau has initiated a rulemaking process, conducted notice and comment, and anticipates a final proposed rule in January 2026.[10] Wisconsin's Department of Workforce Development proposed, and the governor approved, an emergency rule establishing heat illness protections for migrant workers from May to October 2025 but proposed permanent rules.[11] The emergency rule reinstates provisions passed in 2023 that had sunset at the beginning of 2025 in anticipation of a federal heat illness prevention rule that the state planned to enforce.[12] California's Occupational Safety and Health Administration (Cal/OSHA) is considering proposing amendments to its rule that would require employers to distribute copies of the heat illness prevention plan to employees and would add new acclimatization procedures for new and returning employees.[13] This resource does not incorporate these pending and temporary rules in its main analysis.

Photo by Milton Lindsay

II. How Does a Rule Get Enacted?

States vary in whether a heat illness prevention rule or regulation can be enacted administratively (i.e., by a state agency through rulemaking) or legislatively (i.e., by the state legislature through a law or statute or through local government by way of an ordinance).

The appropriate pathway partially turns on whether a state operates its own OSHA program and has an OSHA state plan in place. States interested in administering their own occupational safety and health program can submit a state plan to federal OSHA for approval and then implement and enforce workplace health and safety protections. State plans must be at least as effective as federal OSHA in protecting workers, and federal OSHA maintains an oversight role.[14] Currently, all states with an existing or proposed heat illness prevention standard have an OSHA state plan except for Colorado.[15]

Administrative Route

States with an OSHA state plan are generally poised to enact a heat illness prevention rule administratively.[16] Twenty-one states and Puerto Rico operate an OSHA state plan that covers private-sector employers.[17] These states can enact a rule without prior approval from OSHA, though the state agency could also seek an advisory opinion on the proposed change before it promulgates or adopts a rule.[18] After enactment, the agency must notify federal OSHA of the change.[19] If federal OSHA finalizes its own heat illness prevention rule, states with heat illness prevention rules that differ from the federal rule are required to submit a written plan supplement.[20]

Each state has its own procedures for determining whether to promulgate and enact a rule, and the authority to decide whether to act may not sit solely with the state OSHA agency.[21] The relevant agency—typically a division or agency housed under the state's department that oversees labor or industry[22]—likely has both formal (i.e., a petition process) and informal (i.e., direct outreach) channels that individuals can use to request a rulemaking. Individuals can also contact the agency to learn more about the requirements and steps for enacting a new rule in their state.

Sometimes, state agencies develop regulations in response to emergency situations or to prevent fatalities. For instance, it took years before California's Division of Occupational Safety and Health (Cal/OSHA) adopted the first outdoor heat illness prevention rule in the country in 2005.[23] Despite a petition to the agency and drafting efforts throughout the 1980s and 90s, the rule did not move forward until Assemblywoman Judy Chu introduced a relevant bill in the state legislature that gained traction; multiple worker deaths occurred during peak summer heat that year; and Governor Schwarzenegger directed the agency to submit emergency heat stress regulations and voiced support for a permanent standard.[24] In Oregon, OSHA developed its protections in response to an executive order issued by Governor Kate Brown in March 2020,[25] and adopted emergency regulations in 2021 in the wake of an excessive heat event (a "heat dome") that caused over 100 preventable deaths, including several that occurred on the job.[26] Washington's Department of Labor and Industries similarly expanded existing heat protections to affirmatively include preventative measures through an emergency rule in response to the 2021 heat wave; Washington made the rule permanent in the summer of 2023.[27] Following a failed legislative initiative in 2023 and several years of stakeholder engagement, Nevada promulgated its regulation administratively in 2024. [28] New Mexico's pending rule is result of administrative initiative.[29]

In several of the above instances, foreseeable crises prompted emergency regulatory action that led to the enactment of a permanent rule. In many states, the law allows an agency to promulgate a temporary emergency rule without adhering to typical procedures (i.e., notice and comment) when certain conditions are met.[30] Prior drafting efforts or an existing rule (in the case of Washington) may have helped the agency move swiftly to establish an emergency standard. A directive from the governor also advanced action in California and Oregon, giving the agency appropriate justification, or cover, for prioritizing action on heat illness prevention. In Nevada and New Mexico, the agencies cited data like increases in heat-related complaints, workers' compensation claims, emergency room visits, and injury rates to support action.[31]

Legislative Route

In some cases, legislation may be necessary to promulgate a heat illness prevention rule. In states without a state plan, legislation is likely necessary to provide a state agency with authority and a directive to establish and enforce this type of standard. For example, in Colorado, which does not have an OSHA state plan, the legislature directed the state's Division of Labor Standards and Statistics to promulgate rules that protect agricultural workers from heat-related stress illness and injuries as part of the state's Agricultural Labor Rights and Responsibilities Act (2021).[32] Even without a state plan, states can establish laws related to worker health and safety. Under the OSH Act, the 1970 law that created OSHA, a state agency can "assert[] jurisdiction under State law over any occupational safety or health issue with respect to which no standard is in effect[]."[33] However, if federal OSHA sets a heat illness standard in the future, a state would need to submit a state plan to set or continue enforcing its own standard.[34]

Legislation can help move a standard forward in state-plan states as well. For instance, Maryland's standard was developed in response to legislation enacted in 2020 that required the state's Commissioner of Labor and Industry to develop and adopt heat illness prevention regulations by October 2022.[35] While Maryland Occupational Safety and Health (MOSH) proposed a regulation in October 2022, it stalled when advocates protested the rule as too weak.[36] Under a new administration, the agency revisited and promulgated a stronger rule in 2024.[37] Even in California, where Cal/OSHA—with approval from the California Occupational Safety and Health Standards Board—has made updates to the state's rule without specific legislation,[38] legislative action has proved critical. Due to a legislative directive passed in 2022, the Division is currently working on draft changes to the standard to improve acclimatization requirements and to require distribution of the employer's heat illness prevention plan to employees.[39] Cal/OSHA also promulgated California's Indoor Heat rule at the instruction of legislation passed in 2016,[40] though it took eight years to get the rule to the finish line in 2024.[41]

For a longer discussion of California's workplace heat standards, visit: NRDC, *Feeling the Heat: How California's Workplace Heat Standards Can Inform Stronger Protections Nationwide* (2022).

Whether to pursue a heat illness standard through legislation depends on the priorities of the state and the feasibility of enacting a rule administratively. Lack of political will, resource constraints, and jurisdictional or procedural hurdles to administrative rulemaking can make the legislative route toward enactment more effective. As seen in Maryland and California, rulemaking can still take several years following a legislative

directive. Even with a directive, the priorities or politics of the state's executive branch can delay rulemaking or result in a different rule than anticipated. Legislation should include a clear enactment timeline, specific directives (as feasible) to encourage a strong result, and mechanisms to hold the administration accountable to that directive.

Local Regulation

Depending on the authority granted to local government under state law, localities may have the power to enact heat illness prevention rules in areas or industries under their jurisdiction. Several localities have enacted such rules to protect city contractors, subcontractors, and/or employees.[42]

Broader local initiatives to protect private-sector employees have met legislative roadblocks, specifically in the form of state laws that preempt—or invalidate—certain types of local legislation. In Texas, for example, the cities of Dallas and Austin each enacted ordinances requiring rest breaks for construction workers.[43] The Texas legislature then passed H.B. 2127, the "Death Star" law, in 2023, preempting local laws that go beyond state law provisions on certain subjects, including rest breaks and other terms of employment.[44] Following a campaign led by WeCount!, Miami-Dade County considered enacting a heat standard for outdoor workers in construction and agriculture.[45] The Florida legislature responded by passing a law that prohibits localities from requiring employers to meet heat exposure requirements not otherwise required under state or federal law.[46]

Local initiatives can provide an avenue for establishing worker protections. But, as seen in Texas and Florida, state legislatures can curtail this authority by preempting local legislation, a trend that has become more common in recent years.[47]

III. What Are the Core Components of a Heat Illness Prevention Rule?

This section summarizes the core provisions found across existing heat illness prevention standards, identifies key differences, and makes substantive recommendations for future rulemaking.

Scope of Application

State heat illness prevention laws and regulations can vary in scope, with some limiting their application or certain provisions to specific industries, particular work settings, or employers of a certain size. Most state heat illness prevention rules apply generally to all industries, with some narrow job-category exceptions.[48] Only Colorado limits its law's protections to agricultural work and agricultural workers.[49] This is likely due to the standard's genesis in Colorado's Agricultural Labor Rights and Responsibilities Act (2021) and the fact that Colorado does not have a state OSHA plan or department to oversee occupational safety and health more broadly (discussed above on page 8). California's outdoor standard generally applies to all outdoor places of employment, but its "high-heat procedures" are limited to certain industries, including agriculture.[50] Oregon and Washington published their heat illness prevention laws as applied to agriculture in the agriculture chapter of their administrative codes but also have nearly identical standards for general industry.[51]

Most state laws or regulations apply to both outdoor and indoor settings.[52] Notably, Washington's law applies to outdoor work environments only.[53] Nevada's law applies to indoor work settings that are not climate controlled and requires employers to address potential heat-related hazards if the climate control system of an indoor setting is insufficient to address such harms or stops functioning.[54] Minnesota's law applies only to indoor settings and primarily sets rules around temperature control, air flow, and circulation.[55] Uniquely, California publishes separate standards for outdoor and indoor work settings, though many elements of the rules are similar.[56]

Employer size can also play a role. Nevada's law applies to employers with more than 10 employees, or to those involved in the manufacture of explosives.[57] Size also matters in states that incorporate OSHA's "small farm exemption" in their enforcement activities. Due to a longstanding federal appropriations rider, federal OSHA funds cannot be used to conduct enforcement activities on farming operations "with ten or fewer non-family employees that has not maintained a temporary labor camp within the preceding twelve months."[58] States can, however, extend enforcement to small farms using state funds; California, Oregon, and Washington each do so.[59] States enacting heat illness prevention protections for the first time should consider how to adequately fund oversight and enforcement of their standards.

RECOMMENDATION

Heat can negatively impact worker health across industries and settings. To the extent feasible, jurisdictions should enact protections that reach all workers in the state. Additional or nuanced provisions for specific industries may be appropriate to account for unique job characteristics, how strenuous the work is, and the work settings.

Heat Standard Trigger

Most state heat illness prevention laws have some form of "heat trigger"—the temperature or environmental condition at which the law's protections kick in. In some states, additional protective measures like mandatory rest breaks are required at a second, higher heat threshold. States typically use one of three metrics for determining whether the heat threshold has been met: the ambient air temperature (Ambient), the heat index (Heat Index), or the Wet Bulb Globe Temperature (WBGT). These metrics are described in greater detail in the definitions below.

	METRIC USED	INITIAL HEAT TRIGGER	HIGH HEAT TRIGGER
California	Outdoor: Ambient Indoor: Heat Index	Outdoor: 80°F Indoor: 82°F	Outdoor: 95°F Indoor: N/A
Colorado	Outdoor: Ambient Indoor: Ambient	Outdoor: 80°F Indoor: 80°F	Outdoor: 95°F Indoor: 95°F
Maryland	Heat Index	Outdoor: 80°F Indoor: 80°F	Outdoor: 90°F Indoor: 90°F
Minnesota	Outdoor: N/A Indoor: WBGT	Indoor only Heavy work: 77°F Moderate work: 80°F Light work: 86°F	N/A
Nevada	N/A	N/A	N/A
Oregon	Heat Index	Outdoor: 80°F Indoor: 80°F	Outdoor: 90°F Indoor: 90°F
Washington	Ambient	Outdoor: 80°F Outdoor + Nonbreathable clothes: 52°F Indoor: N/A	Outdoor: 90°F Indoor: N/A

Instead of setting a heat trigger, Nevada requires employers to consider potential exposure to heat illness as part of a job hazard analysis, taking into account air temperature, relative humidity, radiant heat, conductive heat, air movement, workload severity and duration, and protective clothing or personal protective equipment (PPE) worn by workers.[60] Nevada OSHA considers any day when the temperature reaches or exceeds 90°F a "heat priority day" and will conduct additional outreach and inspection activities.[61]

Each heat metric accounts for different environmental factors:

- **The ambient air temperature**, or "dry bulb temperature," refers to the air temperature as measured by a thermometer. This metric may be attractive for its simplicity, but it does not account for humidity, which can significantly affect how heat impacts the human body, and other factors.[62]
- The **heat index**, or "apparent temperature," combines air temperature with relative humidity and better indicates what the environment *feels* like.[63] When the humidity is high, perspiration from the

human body is unable to evaporate making the body less able to cool itself.[64] Many weather services and digital apps include the local heat index, making this metric relatively accessible to employers and workers. Federal OSHA and National Institute for Occupational Safety and Health's (NIOSH) offer a Heat Safety Tool App that provides this information.[65] However, heat alerts issued by the National Weather Service are based on values "devised for shady, light wind conditions" and omit other important factors that can contribute to heat illness, like solar and thermal radiation.[66] Direct sun exposure can increase the heat index by up to 15°F.[67]

- The **Wet Bulb Globe Temperature** (WBGT) is the most comprehensive metric available, accounting for humidity, wind speed, and solar and thermal radiation in addition to temperature.[68] As WBGT is commonly used around the world to measure physiological heat stress,[69] many organizations have encouraged federal OSHA and states to adopt this metric in their standards. One challenge with universal adoption is the need for specialized equipment, education, and training to obtain reliable readings.[70] This barrier is surmountable; WBGT monitors are commercially available and already used in some industries and have become more affordable in recent years.[71] Another challenge is that information on current WBGT for particular locations is not as readily available to workers as the ambient temperature and heat index, which can make it more difficult for them to know whether employers are in compliance and can hinder enforcement. Use of the Heat Index with adjustments for solar and thermal radiation was supported by worker advocates in developing the California indoor heat standard because it is more intuitive than the WBGT.

None of these metrics fully accounts for other contextual or personal risk factors, such as a worker's clothing, personal protective equipment or the severity (pace and level of exertion) of the workload undertaken. A legal standard can require employers to account for these factors through a clear directive (e.g., Washington's 52°F trigger for workers wearing non-breathable clothing; Minnesota's varying triggers for different types of work) by requiring adherence to the NIOSH work/rest schedule, or by directing employers to consider such factors when creating a rest break schedule or heat illness prevention plan.[72]

Personal Protective Equipment (PPE)

Hazardous jobs often require a worker to wear PPE to keep themselves safe. In agriculture, PPE can include gloves, goggles, respirators, body suits or coveralls, steel-toed boots, and ear coverings.[73] PPE is required for certain job duties, such as handling pesticides or working in areas with recently treated crops. For such tasks, PPE is typically made from chemically resistant materials (like rubber) that are non-porous, non-breathable, and heavy,[74] although some workers wear less protective cloth face masks or bandanas—all of which exacerbate the risk of heat stress.

Finally, most state laws and regulations simply require protections once the applicable temperature or heat index is met.[75] Maryland specifies that the employer should monitor the heat index through either direct measurement on site, use of local weather data reported by the National Weather Service (or similar authority), or use of the OSHA-NIOSH Heat Safety Tool App.[76] Colorado's rule applies on days when either the temperature hits the trigger or is forecast to hit the trigger, based on the forecasted high temperature for the day.[77]

An employer must also implement safety procedures and provide training if at any point in the calendar year the trigger temperature is "reasonably expected," as further defined by the rule.[78] This kind of additional guidance can encourage employers to proactively take precautions even if there is some uncertainty as to whether the heat trigger at a worksite will be met.

The **OSHA-NIOSH Heat Safety Tool app** provides local heat indexes and associated risk levels, forecasts, precautionary recommendations, and information concerning signs, symptoms, and first aid for heat-related illnesses.

The American Industrial Hygiene Association (AIHA) also recently launched a free **AIHA Heat Stress app** for workers and managers to prevent heat related illness that includes WBGT.

RECOMMENDATION

Jurisdictions should adopt the 80°F heat standard trigger and, if one is needed, a 90°F high-heat trigger; these threshold temperatures are well-supported by scientific research.[79] However, a rule aimed at preventing heat illness should require protective measures once the initial heat trigger is met so it may be less necessary to specify a separate high-heat trigger. Higher triggers, however, can be useful as a means of increasing awareness and vigilance when temperatures are more extreme and to ensure longer and more frequent rest periods. Jurisdictions should adopt the WBGT, measured at the work location, as the standard metric for determining when the heat trigger has been met. To make adoption feasible, they should provide support for lesser-resourced employers to acquire WBGT monitors and provide clear guidance on how to implement these tools. A rule should establish an enforceable separate lower threshold for workers in personal protective equipment[80] or direct employers to consider contextual factors that increase worker risk—such as clothing or other heat sources which includes metabolic heat and pace and level of exertion of work—in establishing their own safety plans and policies.

Water

Water consumption is necessary for workers to rehydrate and mitigate the risk of heat exhaustion, heat stroke, and other heat-related injuries, particularly after losing water through sweat.[81] Independent of hydration, cold fluid ingestion has also been shown to effectively cool the body to help protect against heat illness.[82] Keeping water cold or cool (<71.6°F) increases its palatability and makes it more likely that workers will consume sufficient quantities.[83] Studies have shown that workers are concerned about the safety of the water supplied to them. Additionally, some are concerned about the cleanliness of the water provided, particularly if it is located close to bathroom facilities while others are concerned about drinking too much water throughout the day because bathroom facilities are located too far from their work areas.[84]

Most state heat illness prevention laws require an employer to provide one quart, or 32 ounces, of water per hour for each worker.[85] These laws require the water to be "cool," with Oregon and Colorado further specifying a temperature range: 35°F–77°F in Oregon[86] and at or below 60°F in Colorado.[87] California further specifies that drinking water must be fresh and located "as close as practicable" to working areas.[88] Additionally, as part of its Field Sanitation Standard, federal OSHA already requires agricultural employers to provide workers with suitably cool potable water in sufficient amounts and in readily accessible locations.[89] The federal standard applies only to agricultural establishments where 11 or more employees are engaged in hand-labor operations on any given day, though some states extend their field sanitation rule to all agricultural employers.[90]

Lawmakers and regulators may consider including electrolyte drinks in a drinking water provision. Electrolyte drinks can help replenish essential minerals that support critical bodily functions.[91] Federal OSHA recommends that employers provide electrolyte-containing beverages for jobs lasting longer than two hours.[92] However, these beverages may also contain high levels of sodium and sugar that can be harmful to some individuals,[93] and individual replenishment needs can vary widely.[94] NIOSH recommends replenishing salt and other electrolytes through meals rather than beverages.[95] Currently, Oregon allows "electrolyte-replenishing beverages" to meet its drinking water provision so long as the beverage does not contain caffeine and does not completely replace the required water supplies.[96] Washington allows such beverages to satisfy the drinking water provision if they do not contain high amounts of sugar or caffeine.[97]

RECOMMENDATION

Jurisdictions should require employers to provide, at no cost to employees, one quart (32 ounces) of clean, fresh, cool water per hour per worker, as required in most states. Workers should be provided with portable methods to carry water, have water brought to them regularly throughout the day, or have water stations set up around the work area.[98] To ensure the water is safe, jurisdictions should define "potable water."[99] Water should be easily accessible to workers so that they do not have to walk a significant distance or cross a barrier like a ditch. In the context of the federal produce safety rule, the FDA recommends having beverages available at the end of a crop row as a best practice.[100] To avoid confusion over what qualifies as "cool," states should specify that water be provided at a temperature below 71.6°F. If a jurisdiction permits the provision of electrolyte drinks, those beverages should be allowed only as a supplement to, and not as a replacement for, the required drinking water.[101]

Shade and Cool-Down Areas

Experts consistently recommended access to adequately protective and outdoor cool shaded areas and indoor cool areas to help prevent heat-related illness and injury.[102] Shade provides workers an opportunity to reduce their "exposure to solar radiation" and "overall heat load."[103] However, access to outdoor shade alone in states with high humidity may be insufficient to lower body temperatures. Coupled with rest periods, discussed below, shade and cool rest areas give workers an opportunity to cool down and stave off heat stress symptoms.[104]

Most state standards expressly require employers to provide outdoor workers with shade once the initial heat trigger is met.[105] California also requires that shade be available to workers, upon request, even before the threshold is reached.[106] Shade may be artificial or natural so long as it blocks direct sunlight. The laws and regulations generally require the shaded area to be open air or to provide ventilation or cooling; large enough to provide all employees on rest periods (or meal breaks) a space to sit without being in contact, with one another; away from equipment that could add heat to the space; and away from any conditions that would make the area unsafe or unhealthy and discourage access or use.[107] Maryland further requires that the area "accommodate the removal and storage of PPE during periods of use."[108] Each rule requires shade to be located nearby; four states require the shaded area to be "as close as practicable to the areas where employees are working,"[109] while Colorado specifies that it must be located within .25 miles from the worksite for workers on foot.[110]

Most state laws or regulations also allow employers to substitute shade for alternative but equally effective cooling mechanisms (e.g., an air-conditioned area, individualized cooling mechanisms) when providing shade is unsafe or not possible.[111] California's indoor standard requires employers to maintain one or more "cool down areas"—with similar space and proximity requirements as those for outdoor shade—where the temperature is kept at less than 82°F and to which employees have access at all times.[112] Other states with rules that apply to indoor work settings do not distinguish between the cool down areas offered to indoor workers and the shaded areas offered to outdoor workers; the same standard applies.[113]

RECOMMENDATION

Jurisdictions should require employers to provide shade that fully blocks direct sunlight; over an area sufficient for workers to sit comfortably without being in contact with one another and with sufficient room to don, doff, and properly store PPE; and in a location that is open air or well ventilated, free from any additional heat sources, and removed from any conditions that would make the area unsafe, unsanitary, or an undesirable place to rest. Rules should prohibit shade from equipment like tractors (which can concentrate heat and pose safety hazards) and clarify that shade from vegetation must be equivalent or better to shade provided by an artificial covering. Where natural vegetation is relied on for shade, the foliage must be of sufficient density to completely block the sunlight, should allow workers to sit in a normal posture, and should not increase risk of exposure to pesticide residues or bites from spiders, snakes or ticks.[114] Lawmakers or regulators should require that the shaded area be as close as practicable to the worksite and define an outer boundary (i.e., .25 miles) to provide greater clarity in support of compliance.

Regulators should further specify that for indoor work settings, employers are required to provide a cool-down area that is air conditioned or well-ventilated, maintained at a heat index below 80˚F, and located far away from any heat sources. If such an area is not available, then an open-air shaded area that meets the above specifications may serve as a substitute.

Rest

Rest periods are necessary to reduce or prevent heat strain, both reducing exposure time and providing the body an opportunity to cool down.[115] The clothing or PPE worn, work intensity, personal risk factors, and relative humidity can affect the duration of rest needed to effectively protect against heat strain and potential heat-related injuries or illnesses.[116]

Several states expressly direct employers to allow and encourage employees to take preventative cool-down rests in a shaded or cool-down area when the employee feels the need to do so.[117] Nevada and Maryland do not directly require these measures but do require employers to include a plan for providing rest breaks to workers as needed in the written safety plan[118]Additionally, most states with heat illness prevention standards require employers to provide workers a ten-minute paid rest break for each four hours of work (or major fraction thereof) irrespective of heat; this list includes California,[119] Colorado,[120] Nevada,[121] Oregon,[122] and Washington.[123] Requiring that employees are paid for rest periods is critical to ensuring that rest breaks are taken. Oregon, Washington, and California make explicit that the rest period must be paid unless it is taken as part of an unpaid meal break.[124] California goes a step further to require employers to provide an additional hour of pay at the regular compensation rate if the rest recovery period is not provided.[125]

Piece-rate Pay and Rest Breaks for Farmworkers in California

Although hourly wages are the more prevalent basis for farmworker pay, many farmworkers continue to be paid by the piece.[126] Piece-rate pay incentivizes workers to work quickly and efficiently, discouraging them from taking breaks or pausing to drink water and increasing their risk of experiencing heat-related illness.[127]

California offers a model for compensating piece-rate workers for rest breaks. In California, employees must be compensated for rest and recovery periods separate from any piece-rate compensation.[128] Itemized wage statements must separately account for this compensation.[129] Employee compensation for these rest periods must be the higher of the applicable minimum wage or "an average hourly rate determined by dividing the total compensation for the workweek, exclusive of compensation for rest and recovery periods and any premium compensation for overtime, by the total hours worked during the workweek, exclusive of rest and recovery periods."[130] This separate pay guarantee mitigates the financial loss that workers could otherwise incur due to non-productive rest periods.

Every state with an outdoor standard, except Nevada, mandates the provision of rest breaks at a specified cadence once the high-heat trigger is met. California and Colorado require a minimum ten-minute preventative cool-down rest period every two hours for agricultural employees.[131] Maryland, Oregon, and Washington require employers to create a rest schedule and to provide workers with a minimum rest period of ten minutes every two hours when the temperature is at or above 90°F and 15 minutes every hour when it hits 100°F.[132] Maryland and Washington permit employers to implement a rest schedule in line with relevant NIOSH recommendations.[133] Oregon goes further and offers three options: (1) employers can use the minimum rest schedule but must factor in additional considerations, like PPE, work clothing, relative humidity, and work intensity; (2) employers can implement the NIOSH work/rest schedule, adjusted for humidity and clothing; or, (3) employers can use a simplified schedule that requires 10 minutes every two hours at 90°F; 20 minutes every hour at 95°F, 30 minutes every hour at 100°F, and 40 minutes every hour at 105°F.[134]

More Research is Needed to Assess Work-Rest Protocol Effectiveness

Work-rest protocols are recommended to keep core body temperatures from exceeding 100.4°F (38°C) to prevent heat-related illness. However, a 2024 review of experimental studies on work-rest regimens under hot conditions found that adhering to work-rest protocols was typically insufficient to keep core body temperatures at the target level.[135] Seventy-seven percent of reviewed studies showed core temperatures exceeding 100.4°F.[136] Of the 642 participants represented in the studies, 94 percent were male,[137] demonstrating an additional data gap related to work-rest protocol effectiveness for maintaining safe core temperatures in female workers.

RECOMMENDATION

Jurisdictions should require employers to give workers a ten-minute, paid[138] rest break every two hours once the initial heat trigger is met, and additional breaks as needed. Starting breaks at this lower threshold removes pressure workers may feel to work continuously and not take a break even when they begin feeling signs of heat stress. This cadence also approximates the break frequency already required in states with separate rest break provisions (i.e., a ten-minute break for four hours of work, approximately at the midpoint). The rest break should not include the time it takes an employee to walk to the shaded rest area or don, doff, and properly store PPE. For higher temperatures, Oregon's approach offers a good model for balancing flexibility with worker protection. For piece-rate workers, jurisdictions seeking to address the negative effects of piece-rate pay on employee health can amend their wage and hour laws to require separate compensation for rest and recovery periods. Additionally, since fast pace of work contributes to risk of heat illness, regulators should consider requiring suspension of production quotas and piece-rate work during heat waves.

Acclimatization

Acclimatization is the body's process of physiologically adapting to environmental heat exposure over successive days, thereby increasing the individual's heat tolerance and reducing heat strain and the potential of experiencing heat illness or injury.[139] These changes include increased sweating efficiency and stabilized circulation, such that after 7–14 days of daily exposure, "most individuals perform the work with a much lower core temperature and [heart rate] and a higher sweat rate (i.e., a reduced thermoregulatory strain) and with none of the [heat exhaustion] symptoms that were experienced initially."[140] These adaptations are lost after seven or more days away from the heat conditions, requiring a (shorter duration) re-acclimatization period after an extended absence.[141] Because most heat related fatalities occur during a worker's first week on the job, it is critical to ensure proper acclimatization.[142] NIOSH recommends that new workers gradually increase exposure time on the job, starting at 20 percent of the usual duration of work on the first day and increasing no more than 20 percent on each subsequent day, over a period of 7–14 days.[143] Acclimatization can take more time for non-physically fit and older individuals, those taking certain therapeutic drugs, and those with other medical conditions.[144]

State approaches to acclimatization vary. California, Maryland, Oregon, and Washington recognize that acclimatization can take up to 14 days.[145] Maryland, Oregon, and Washington require re-acclimatization for workers away from the job for more than seven days.[146] Colorado, in contrast, defines the acclimatization period as an employee's first four workdays for the employer, including the first four days of work following a month's absence.[147] Nevada does not mention acclimatization in its regulation but the state's guidance for employers recommends consideration of acclimatization protocols in the employer's job hazard analysis as a heat exposure mitigation tool.[148]

Photo by David Bacon

Some states merely require observation during the acclimatization period, while others incorporate or adapt the NIOSH acclimatization plan for gradually exposing workers to heat conditions.

REQUIREMENTS FOR ACCLIMATIZATION PERIOD (DURATION)	
California[149]	Close observation of employee by a supervisor or designee. • *For all employees during a heat wave (predicted high temperature of at least 80°F and 10°F higher than preceding five-day average).* • *For newly exposed employees, 14 days.*
Colorado	No more than two hours of work are performed before at least 10 minutes of rest are provided. • *For new or returning employees, 4 days.*
Maryland	Monitoring of employee through a communication device, a buddy system, or other effective means of observation. Develop and implement written acclimatization schedule, with enumerated considerations factored in. Options include adopting the NIOSH recommendations. • *Schedule over 14 – 5 days.*
Oregon	Develop and implement written acclimatization plan, either a plan developed by the employer that includes enumerated factors or a plan adopted from the NIOSH recommendations.
Washington	Close observation of employee through a communication device, a buddy system, or other effective means. • *For newly exposed or returning employees, 14 days.* • *For all employees during a heat wave (predicted high temperature of at least the heat standard trigger and 10°F higher than preceding five-day average).* Employers may also consider adopting procedures in the NIOSH Recommendations.

RECOMMENDATION

Jurisdictions should require employers to develop and implement an acclimatization schedule for any employee newly exposed to heat or returning to work after seven days away. In addition to following the NIOSH recommendations for gradually increasing exposure, the schedule should account for contextual factors at the worksite (e.g., PPE, availability of cooling measures) and individual factors that may warrant scheduling adjustments for individual employees (e.g., personal risk factors, prior experience). Adjustments to workers' schedules for acclimatization without pay is likely not economically feasible for seasonal agricultural workers so jurisdictions should consider how to account for this when creating requirements. Close observation of employees during the acclimatization period should be required, though jurisdictions should also consider a monitoring requirement for all employees once the heat trigger is met.

Training

Training is an important tool for informing employees of the protections to which they are entitled, the employer's plan for providing those protections, individual risk factors affecting susceptibility to heat stress, the tools for mitigating heat stress, the self-monitoring behaviors that can help them recognize their own heat stress symptoms, and how to report and respond to the signs and symptoms of heat-related illness and injury. Through these trainings, employees are better equipped to self-identify when they might need a preventative cool-down rest break, how much water to drink and how frequently, when to seek medical attention for themselves or a colleague, and what rights they can assert in the workplace to protect themselves and others.

Every state requires employers to provide employees with relevant training.[149] Most standards enumerate a list of topics the training must cover.[150] California, Colorado, and Oregon each require the training to inform workers of their existing right to be free from employer retaliation (i.e., whistleblower protections).[151]

With slight variation, the standards generally require that training occur prior to any anticipated heat exposure at work.[152] Colorado requires training by April 20 of each year and upon hiring for new employees after that date.[153] Maryland, Minnesota, Oregon, and Washington make an annual re-training requirement explicit.[154] Three states (California, Colorado, and Washington) require additional training for supervisors on their role and responsibilities in implementing the protections under the rule.[155] Finally, four states (Maryland, Minnesota, Nevada, and Oregon) require the employer to document trainings and maintain records that are to be made available for inspection by the state's OSHA department upon request.[156]

The efficacy of workplace training varies widely depending on the delivery format. For instance, watching a video or reviewing a pamphlet will not result in the same degree of retention and understanding as participatory training models that incorporate facilitated dialogue, role-playing and demonstrations, problem-solving activities, and other types of interactive content.[157] Language and literacy access are also critical for understanding and implementation.

Most current heat illness prevention standards offer limited guidance on training format. Oregon's rule requires training to be delivered "in a language and vocabulary readily understood, and in a manner that facilitates employee feedback."[158] Maryland and Washington require training "in a language and manner that all employees and supervisors can understand."[159] California's rule calls for "effective" training without specifying language accessibility,[160] but further guidance from the agency instructs that language access is necessary to meet the employer's obligation.[161] Colorado requires content to be delivered in the employee's primary language but allows that communication to be delivered in written form or online.[162] Colorado's regulation also points employers toward several published heat illness prevention training guides that offer instruction and tools for providing more interactive training, though it does not go as far as making interactive trainings mandatory.[163]

RECOMMENDATION

Jurisdictions should require on-the-clock heat illness prevention, recognition, and response training for workers, including those working on a temporary or day to day basis, before they begin work in a setting in which the environmental conditions are reasonably anticipated to meet the heat standard trigger. Re-training should occur at least annually and after a heat-related illness or injury at the worksite resulting in hospitalization or fatality. The law should list essential topics to be covered (including retaliation/whistleblower protections), require that training be delivered in a language each employee can understand and at an appropriate literacy level, and require employers to maintain records of all trainings administered. Supervisors should be required to receive further training in their responsibilities and emergency procedures. Lawmakers could go further and encourage the use of interactive training models or collaboration with a worker's organization to deliver the training.

Training Resources on Heat Illness Prevention

Several organizations offer training resources on heat illness prevention, including:

- **Heat Education and Awareness Tools (HEAT)**
  Pacific Northwest Agricultural Safety and Health Center, University of Washington
- **Heat Illness Prevention**
  Western Center for Agricultural Health and Safety, University of California, Davis
- **Heat Stress Prevention**
  Association of Farmworker Opportunity Programs (AFOP)
- **Building Blocks for a Heat Stress Prevention Training Program**
  National Institute of Environmental Health Sciences, National Institutes of Health

Worker Monitoring and Emergency Response

Generally, heat illness prevention rules make employers and their agents responsible for observing and communicating with workers to monitor signs of heat illness. Monitoring methods can include implementing a mandatory buddy system, communicating with employees through radio or phone, or, in California and Colorado, designating an individual to observe up to 20 employees.[164] A recent study with farmworkers in Florida found that mandatory buddy systems can also be leveraged to encourage preventive heat safety practices among peers.[165] Colorado requires employers to maintain effective communication and a means of monitoring employees once the initial heat trigger is met or anticipated.[166] In most other states, employer responsibilities to communicate with and systematically monitor employees kick in at the high-heat threshold.[167]

The standards typically require employers or their designees to respond to signs and symptoms of heat illness by relieving an employee of their duties, monitoring their symptoms, providing care or first aid as appropriate, contacting emergency medical services if symptoms become severe, and providing transportation as appropriate.[168] Oregon's rule, which incorporates requirements from a separate rule governing emergency medical plans, requires employers to contact their local emergency response system and evaluate their ability to handle the types of illnesses and injuries likely to occur, train all employees on the medical plan and their respective responsibilities during an emergency, and post the emergency plan with details employees can follow in the event of an emergency, such as instructions on whom to call and what further actions to take.[169] In California, the regulations require effective communication so that workers can reach a supervisor when necessary and specify that electronic communication is only acceptable if reception in the area is reliable in addition to other requirements related to the provision of first aid.[170]

RECOMMENDATION

Jurisdictions should require a heightened monitoring system once the initial heat trigger is met. Monitoring could include implementing a mandatory buddy system, designating some to observe 20 or fewer employees (in close proximity), and maintaining effective communication and regular check-ins with isolated employees through an electronic device with reliable reception. A worker displaying symptoms should be immediately relieved of all duties; provided rest in a shaded area, water, and appropriate care; and closely monitored for more development of more serious symptoms. While one or more individuals may be designated to contact emergency services, all employees should be empowered and equipped to contact emergency medical services to expedite medical attention, accounting for unreliability in cell service. Workers should also be provided with first aid equipment and trained on immediate cooling techniques they can implement while waiting for emergency services. Employers should be responsible for transporting an employee to a location where they can be reached by an emergency responder. Because work sites can be in remote areas, employers should consider and account for the time it will take for an emergency responder to reach the site and ensure the fields are accessible to emergency vehicles.

Written Plan and Hazard Analysis

Nearly every state requires employers to maintain a written plan that addresses heat illness prevention. These rules sometimes intersect with existing employer obligations to maintain other types of plans, like a required Illness and Injury Prevention Program.[171] The plans, typically, must include the employer's procedures for meeting the various heat illness prevention standard requirements and procedures for emergency response.[172] These plans must be accessible to workers—with some rules including a language requirement—and made available to the relevant state agency upon request.[173]

In May 2025, California released a new tool called **CalHeatScore** to protect at-risk communities from dangerous heat waves. This tool could be a reference for refining hazard analysis.

RECOMMENDATION

Jurisdictions should require employers to put their heat illness prevention plans in writing, with details of how the employer will implement the state's requirements and account for additional factors that could exacerbate hazardous heat conditions. The plan should be available to each employee in a language and at a literacy level they understand, made available to their designated representative, and centrally posted for easy access. Plans should be updated regularly, including when there are major changes to work processes.

Nevada's Focus on Job Hazard Analysis and Planning

Nevada takes a unique approach to heat illness prevention and centers its rule around job hazard analysis and planning.[174] Employers with more than ten employees must prepare a "one-time, written job hazard analysis to assess working conditions that may cause occupational exposure to heat illness."[175] If the employer determines that an employee faces exposure, then the employer must incorporate relevant provisions to address and mitigate the hazard in their written safety program and designate someone to carry out those provisions, monitor working conditions, and take action in an emergency.[176] The employer's written safety program must include the provision of potable water, rest breaks and means of cooling employees; monitoring by the employer's designee; mitigation of work processes that generate additional heat or humidity; training; and emergency response procedures. Rather than specifying the methods to be used, the rule requires that the employer's measures "reasonably mitigate the risk of occupational exposure to heat illness for the affected employees."[177] Thus, while requiring employers to plan and implement procedures similar to those in other states, the state largely omits specific requirements as to how each of those obligations should be met. This approach leaves much to employer discretion and likely complicates monitoring and enforcement of worker protections.

Industry has uplifted Nevada's approach as an alternative to the rule proposed by OSHA under the Biden Administration in 2024.[178] Rather than oppose the rulemaking entirely, some employers are proactively advocating for a "performance-based, flexible rule" like Nevada's.[179] As noted, this approach fails to provide clear protections for workers, leaves much to employer discretion, and burdens all parties—employers, workers, and enforcement agencies—with navigating considerable uncertainty. A better approach would establish clear obligations to promote efficiency in implementation and accountability.

IV. What Further Protections Should Be Pursued?

This section describes additional provisions jurisdictions could consider in addition to the standard rule components described above. While several of these recommendations would enhance a rule's efficacy and protection for all workers, others reflect the unique needs and circumstances of farmworkers in the United States.

Extend Protection to Worker Housing

Some farm employers provide housing to attract and secure the workers needed to operate the business. Additionally, employers of H-2A workers (foreign nationals who come to the United States on a visa to work temporary or seasonal agricultural positions) must provide housing to H-2A workers and workers in corresponding employment.[180] Despite rising temperatures across the country, most worker housing does not have a cooling mechanism, and fans are often insufficient.[181] Workers exposed to high heat during the day may not have an opportunity to cool off in the evening and overnight, making their bodies more susceptible to heat illness during work and disrupting their sleep.[182]

OSHA regulations for temporary labor camps do not require cooling in employer provided housing.[183] However, states enacting heat illness prevention rules can fill this void by including requirements for employer-provided housing.

Oregon currently requires employers to provide cooling areas large enough to accommodate 50 percent of the housing occupants if rooms where people sleep cannot maintain an indoor temperature of 78˚F or less.[184] Additionally, employers must optimize other ways to keep housing cool (i.e., window coverings) and make fans available.[185] Beginning in 2027, employers must ensure that rooms where people sleep can maintain a

Photo by David Bacon

temperature of 78˚F or less once the outdoor heat index is at or above 80˚F and ensure a temperature 15˚F lower than the outdoor heat index once the heat index is at or above 95˚F.[186] Employers must also provide a thermometer in each housing unit that displays both Fahrenheit and Celsius, prominently display an Oregon OSHA poster on "Heat Risks in Housing," and ensure occupants have access to a working phone to contact emergency services if needed.[187]

Portable AC units—freestanding and window units—are widely available, making employer compliance with cooling requirements feasible. Given the risks and lack of worker control over employer-provided housing conditions, states should require employers to provide indoor cooling at no cost to the employee when the outdoor heat index reaches 80˚F. Given that poor insulation can exacerbate indoor heat, states should require monitoring of indoor temperatures to ensure cooling when the indoor heat index reaches 80˚F.

Codify or Reinforce Retaliation Protections

Heat illness prevention protections can only be effective if they are followed and enforced. Workers must be able to voice concerns or make complaints to their employer and managers, and report potential violations to others, without fear of retaliation.

The federal OSH Act prohibits an employer from discharging or discriminating against an employee for filing a complaint, causing or testifying in a proceeding, or exercising a right under the OSH Act.[188] Protected actions include communicating about safety matters to management, asking questions or expressing concerns, reporting work-related injuries or illness, filing a complaint with OSHA, and participating in an OSHA inspection.[189] Remedies for instances of retaliation can include rehiring or reinstatement, back wages, and damages.[190]

Many states already have relevant anti-retaliation laws. States with an OSHA state plan should have in place one that is at least as strong as that in the OSH Act.[191] In enacting heat illness prevention rules, state agencies can expressly reference these laws to make these rights clear to both employers and workers. California, for instance, references the state's relevant anti-retaliation law in a note appended to its heat illness prevention rules.[192] California, Colorado, and Oregon refer to this existing right in their rule's provision on training.[193] Colorado, which does not have an OSHA state plan, enacted applicable retaliation protections for agricultural workers in its Agricultural Labor Rights and Responsibilities Act (2021).[194] Legislation to enact a rule in similar states should expressly incorporate existing anti-retaliation protections or clearly establish such protections as applied to a heat illness prevention rule.

States can go further than federal rules in protecting against retaliation. Additional protection can include:

- Expanding the protection to expressly include communications with fellow workers and consultation with service providers or labor organizations concerning rights or conditions protected under the rule.
- Extending the length of time to file a retaliation complaint beyond 30 days after the alleged retaliation.[195]
- Establishing the right for the employee to assert a retaliation claim in court;[196] under the federal rules, employees are limited to seeking remedies through OSHA and do not have a right of action to bring their claim in a private lawsuit.

Include Consideration of Personal Protective Equipment

Many agricultural workers wear long sleeves, face coverings, extra clothing and other forms of personal protective equipment (PPE) to protect against exposure to workplace hazards. This type of clothing and equipment can prevent the body from effectively cooling down and cause the body to produce a greater amount of heat, thereby causing or exacerbating heat stress that can lead to injury or death.[197] However, PPE is also necessary for employee safety. Under the Worker Protection Standard (WPS), employers must provide certain workers with PPE to prevent or mitigate worker contact with hazardous pesticides and pesticide residues.[198] Given the interplay between these common workplace hazards, the WPS requires employers to train workers whose jobs require PPE on the "prevention, recognition, and first aid treatment of heat-related illness,"[199] and to ensure measures are taken to prevent heat-related illness for pesticide handlers wearing PPE.[200]

Most existing heat illness prevention standards expressly acknowledge certain clothing and PPE as environmental risk factors or increased risk conditions.[201] In addition to naming the concern, the standards can require employers to take additional precautions, such as:

- Adhering to the heat illness prevention rule at a lower temperature threshold when employees are wearing nonbreathable clothing or clothing that increases body temperature; in Washington, for example, the heat trigger is met when the temperature hits 52˚F for employees required to wear "nonbreathable clothes including vapor barrier clothing or PPE such as chemical resistant suits."[202]
- Providing workers required to wear extra clothing or PPE with additional rest breaks.[203]
- Providing workers with sufficient time and space to don, doff, and store PPE during their breaks in shaded areas.[204] Donning and doffing time should not count toward the required rest period. Additional space or facilities may be necessary to ensure that workers do not contaminate themselves, others, or surfaces when donning and doffing PPE.[205]
- Accounting for the effects of clothing and PPE in their acclimatization plan[206] or rest break schedule.[207]
- Providing worker training on the added burden of heat load on the body caused by clothing and PPE.[208]
- Providing workers required to wear nonbreathable clothing or PPE with wearable sensors to help monitor to help monitor physiological indicators of heat stress.[209]

States can also encourage or require employers to provide employees with personal heat-protective equipment to assist employees in cooling down or in situations when other controls are insufficient or unavailable to minimize heat risks.[210] Auxiliary cooling systems can include water or air-cooled garments, cooling vests, and wetted overgarments.[211] Despite some practical limitations of using these tools during work, such cooling systems can be used effectively during rest breaks.[212]

Increase Recordkeeping Requirements

Mandatory recordkeeping supports state oversight and enforcement activities and can encourage employer compliance with the rules. OSHA requires agricultural employers with more than ten employees to maintain injury and illness records documenting fatalities, injuries, or illnesses that result in loss of consciousness,

days away from work, restricted work, transfer to another job, or medical treatment beyond first aid;[213] certain serious incidents require reporting irrespective of employer size.[214] States can augment this requirement by requiring employers to maintain records concerning:

- Any heat illness or injury requiring medical intervention, including first aid, and the environmental and work conditions at the time of the illness or injury, irrespective of employer size.[215]
- Provision of required training, including attendance, date of training, identity of person who conducted the training, and a copy of the training materials used.[216]
- Any deviation from the heat illness prevention standard requirements and supporting justification.[217]
- Measurements made to determine environmental and metabolic heat exposures to workers, including by documenting the temperature, heat index, or WBGT at specified intervals or under certain conditions.[218]
- The acclimatization procedures adhered to and relevant dates of implementation.

Enhance Protections for Pregnant, Elderly, and Child Workers

Personal risk factors can increase the risks certain workers face from heat exposure. Pregnant people have reduced tolerance of heat stress and require more fluids and rest to cool down their core temperature.[219] Heat stress during pregnancy can also negatively impact fetus development.[220] Older individuals are also at higher risk for heat-related illness and are generally slower to adapt to heat.[221] Child labor laws place fewer restrictions on the hours and activities of children employed in the agricultural sector than in other industries,[222] meaning that this vulnerable population may also be working long hours (particularly over summer when school is not in session) with even less experience and agency than adult workers to engage in protective behaviors and assert their rights.[223] Jurisdictions can account for these differences by requiring employers to incorporate consideration of these risk factors into their written safety plans and provide these workers with additional or longer rest breaks, longer acclimatization periods, and special emphasis in employee monitoring and communication systems. Given the need for additional protections and requirements, states should consider employment protections in the event these workers are discriminated against.

Clarify Employer Responsibility for Temporary Workers

The agricultural industry relies heavily on farm labor contractors (FLCs) to bridge the gap between growers and farmworkers. An FLC acts as an intermediary, bringing crews of farmworkers to growers who require a larger labor force for a temporary period. FLCs employ approximately 22 percent of U.S.-based crop workers.[224] FLCs also play an increasing role in connecting agricultural employers with H-2A workers—foreign nationals who come to the United States on a visa to work temporary or seasonal agricultural positions.[225]

FLCs, and other types of employment intermediaries, can create confusion over who bears responsibility for ensuring compliance with worker health and safety protections. To ensure that workers receive the protections to which they are entitled, jurisdictions should specify that owner/operators are responsible for either implementing the rule's requirements or assuring that any intermediary used to hire workers follows and implements the rule. Jurisdictions can further dictate that owner/operators will be held jointly responsible for any violations.

Extend Protections to Small Farms

As noted previously, a small-farms appropriations rider exempts farms with ten or fewer employees and without a temporary labor camp from federal OSHA's enforcement activities, including investigations.[226] States with a state plan cannot use federal dollars to enforce OSHA rules on small farms. However, states can expand inspection and enforcement activities to all farms so long as those activities are supported by state funds. California, Oregon, and Washington extend these oversight activities to small farms.[227] Nevada does not, and its heat illness prevention rule limits its requirements to employers with more than ten employees.[228]

Expand Oversight through Public-Private Partnerships

State agencies responsible for enforcing worker health and safety protections often face funding and resource deficits. The remote location of agricultural job sites can further challenge oversight activities. Agencies can extend their capacity and reach by establishing partnerships with worker-serving organizations to provide additional eyes and ears on the ground. For instance, as part of a legal settlement regarding Cal/OSHA's alleged failure to enforce the state's heat illness prevention regulation, the agency agreed to establish streamlined procedures and response guidelines with United Farm Workers (UFW) and UFW Foundation, which was memorialized in a Memorandum of Understanding.[229]

Private Regulation

In some regions, enactment of state or local regulations on heat illness prevention is unlikely. Workers in these states can turn to private regulation and enforcement mechanisms to increase workplace safety. Private regulation can include worker-driven social responsibility (WSR) programs, union representation and terms in collective bargaining agreements, and third-party certification schemes.

- **The Fair Food Program** (FFP)—a WSR program established by the Coalition of Immokalee workers and first implemented with tomato growers in Immokalee, Florida—requires participating growers to adhere to a Fair Food Code of Conduct. As related to heat, these standards require mandatory breaks, shade, water, electrolytes, training, and emergency response measures on participating farms.[230] Supply chain agreements with buyers (e.g., large retailers) require growers to adhere to these provisions or risk losing market opportunities. The FFP is unique in centering workers in standard development, training, and monitoring.

- **The Farm Labor Organizing Committee, AFL-CIO** is leveraging an existing rest-break provision in its collective bargaining agreement to implement guidelines that counsel workers to take more frequent rest breaks in high heat conditions.[231] In a non-agricultural example, the Teamsters negotiated an agreement with United Postal Service for the company to equip its vehicle fleet with cooling and heat protection systems.[232] Although union representation of farmworkers is growing—in part thanks to recent state-level legislation—union density among farmworkers is still relatively low.[233] This underrepresentation is due, in part, to the exclusion of agricultural workers from the protections of the National Labor Relations Act.[234] Additionally, the Department of Labor recently proposed rescinding its regulation that enabled workers to engage in collective action without retaliation.[235]

- **The Equitable Food Initiative (EFI)** is a third-party certification program focused on the fresh produce industry.[236] The program's Social Standards require management to develop policies to resolve workplace health and safety issues, including heat stress.[237] Its Food Safety Standards require employers to provide shaded rest areas and rest periods during high heat conditions.[238] While the organization also provides educational resources related to heat illness prevention,[239] its current standards do not appear to address the hazard comprehensively with specific requirements.

Workers and individuals concerned with heat stress illness can encourage growers and other supply chain actors to join these initiatives or voluntarily adopt stricter standards to set themselves apart as responsible brands and employers of choice.

V. What Could the Text of a Rule Look Like?

This sample text is drawn from Maryland's heat illness prevention rule, with edits to align the sample text with the above recommendations and integrate desirable provisions from other state rules. Those who work with farmworker communities have the best perspective on what the requirements should be for their jurisdiction. This sample text should be edited further to align with common practice in the relevant jurisdiction and community-identified priorities.

Because the wet bulb globe temperature (WBGT) is the most comprehensive metric available, many jurisdictions should consider using it in their standards. However, given the concerns about worker access to information about the WBGT and the challenges this creates for enforcement and monitoring, some jurisdictions may choose to use the heat index as a starting point with the goal of moving toward the WBGT as it becomes used more universally.

To learn more about NIOSH's recommended criteria for a heat stress standard, visit: *Criteria for a Recommended Standard:* NIOSH, *Occupational Exposure to Heat and Hot Environments* (2016).

SAMPLE HEAT ILLNESS PREVENTION RULE

Purpose

The purpose of this chapter is to establish minimum requirements for employers to protect employees from heat-related illness caused by heat stress in the workplace.

Scope

This standard applies to an employer with employees whose employment activities, indoor or outdoor, expose or may be reasonably anticipated to expose employees to a WBGT in the area where the employee is working that equals or exceeds 80°F. For business owner/operators making use of an intermediary to employ workers (e.g., a labor contractor), the owner/operator shall either:

a. Bear responsibility for following and implementing this standard's requirements; or

b. Implement policies and procedures to ensure that any intermediary relied upon to supply workers follows and implements this standard's requirements. This requirement may be met by incorporating this assignment of responsibility through a written contract and by making reasonable oversight efforts to ensure adherence and execution.

c. Owner/operators who do not take the measures described in (b) will be held jointly responsible for any violation of this standard's requirements.

Definitions

In this standard, the following terms have the meanings indicated.

a. “Acclimatization” means the body’s temporary adaptation to work in heat that occurs as a person is exposed over time.

b. “Alternative cooling and control measures” means engineering, work-practice, administrative, or other controls to manage heat, including job rotation, mechanical ventilation systems, misting equipment, cooling vests, air-cooled or water-cooled garments, and access to recreational water.

c. “Drinking water” means potable water that is clean, safe to drink, and maintained at a temperature below 71.6°F.

d. “Emergency operations and essential service” means work in connection with an emergency that requires the involvement of law enforcement, emergency medical services, firefighting, rescue and evacuation operations, or emergency restoration of essential utilities or telecommunications.

e. “Heat exhaustion” means a medical condition that includes, but is not limited to, headache, nausea, vertigo, weakness, thirst, and giddiness.

f. “Heat index” means a measure of how hot it feels when relative humidity is considered along with the dry air temperature.

g. “Heat-related illness” means a medical condition resulting from the body’s inability to cope with a particular heat load, and includes, but is not limited to, heat cramps, heat rash, heat exhaustion, fainting, and heat stroke.

h. “Heat stroke” is a medical emergency that can result in death with symptoms that include, but are not limited to, confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F).

i. “Shade or shaded areas” means blockage of direct sunlight such that objects do not cast a shadow under the area of blocked sunlight.

j. “Signs and symptoms of heat-related illness” means the physiological manifestations of a heat-related illness and includes confusion or delirium, headache, nausea, weakness, dizziness, elevated body temperature, muscle cramps, and muscle pain or spasms.

k. “Radiant heat” means heat transferred by electromagnetic waves between surfaces. Sources of radiant heat include the sun, hot objects, hot liquids, hot surfaces, and fire.

l. “Wet Bulb Globe Temperature” (WBGT) means a heat metric that takes into account dry air temperature, humidity, radiant heat from sunlight or artificial heat sources, and air movement.

a. An employer shall monitor the WBGT throughout the work shift through direct measurement of the WBGT at the same time and location in the areas where employees perform work.

b. An employer shall ensure workers are equipped with information to monitor the WBGT in the area where the employee is working.

c. If measuring the WBGT is infeasible due to equipment malfunction or other issue that cannot be resolved through reasonably diligent efforts, an employer may substitute the heat index to monitor worksite conditions and implement the provisions of this standard. The heat illness shall be monitored using one of the following methods:

    i. Direct measurement of the temperature and humidity at the same time and location in the areas where employees perform work;

    ii. For outdoor work only, use of local weather data reported by the National Weather Service or other recognized source to determine the heat index; or

    iii. For outdoor work only, use of the National Institute for Occupational Safety and Health's Heat Safety Tool application to determine the heat index.

d. An employer shall maintain a record of daily WBGT or heat index monitoring and document justification for any deviation from relying upon WBGT.

e. An employer shall develop, implement, and maintain an effective heat-related illness prevention and management plan in writing.

f. The heat-related illness prevention and management plan shall contain the following elements:

    i. How sufficient amounts of drinking water will be provided in accessible locations at no cost to employees;

    ii. How employees will be provided sufficient opportunities and encouragement to stay hydrated by drinking water;

    iii. How to recognize the signs and symptoms of heat-related illness, including heat exhaustion and heat stroke;

    iv. How to respond to suspected heat-related illness, including heat exhaustion and heat stroke;

    v. How employees will be provided with sufficient time and space to rest in shaded or cool, climate-controlled areas to cool off;

    vi. How the employer will implement rest break schedules;

    vii. How the employer will consider lower heat thresholds, environmental conditions, workload, required clothing, personal protective equipment, and alternative cooling and control measures when determining rest break schedules;

    viii. How employees will be encouraged to take rest breaks as needed to prevent heat-related illness;

    ix. How employees will be trained on the hazards of heat exposure and the necessary steps to prevent heat-related illness;

x. The use and maintenance of alternative cooling and control measures used to manage heat;

xi. Procedures for heat acclimatization in accordance with § 5 of this standard; and

xii. The emergency response plan in accordance with § 10 of this standard.

g. A copy of the written plan shall be provided and made accessible to:

i. Employees and their representatives, in the employee's primary language, upon hire and upon request;

ii. Employees at all times in a centrally posted location, in English and in a second language most commonly understood among employees; and

iii. [relevant enforcement agency] upon request.

Acclimatization

a. An employer shall provide for acclimatization of exposed employees for a period of up to 14 days:

i. When an employee is newly exposed to heat in the workplace; and

ii. When an employee returns to work after 7 or more consecutive days of absence from the workplace.

b. An employer shall develop and implement an acclimatization schedule which complies with one of the following:

i. A schedule which gradually increases exposure time over a 5–14-day period, with a maximum 20 percent increase each day;

ii. A schedule which uses the current National Institute for Occupational Safety and Health's recommendations for acclimatization; or

iii. A schedule which uses a combination of gradual introduction and alternative cooling and control measures that acclimate an employee to the heat.

c. The acclimatization schedule shall be in writing must consider and adjust for the following elements:

i. Acclimated and unacclimated employees;

ii. The environmental conditions and anticipated workload;

iii. The impact of required clothing and personal protective equipment to the heat burden on employees;

iv. The personal risk factors that put an employee at a higher risk of heat-related illness, including age, voluntarily disclosed medical history, and pregnancy;

v. Re-acclimatizing employees as necessary;

vi. The use of alternative cooling and control measures; and

vii. Compensation for workers.

Monitoring

a. Once the heat trigger is met or reasonably anticipated on a given workday, an employer shall monitor employees for signs of heat-related illness through regular communication via:
    i. A mandatory buddy system;
    ii. Phone or radio;
    iii. Supervisor or designee observation of 20 or fewer employees in close proximity; or
    iv. Other equally effective means of observation.

Access to Shade and Cool Down Areas

a. Except as provided in (c) and (d) of this section, an employer shall provide shaded areas to exposed employees as close to the work area as practicable and in no case further than 0.25 miles from the work area for employees accessing the shade by foot.
b. Shaded areas shall:
    i. Be outside, open, and exposed to air on at least three sides or indoor and air-conditioned;
    ii. Prevent contributing heat sources from reducing effectiveness;
    iii. Be sufficiently sized for the number of employees utilizing the shaded area;
    iv. Be arranged in a configuration that allows employees to sit in normal posture; and
    v. Accommodate the removal and storage of personal protective equipment during periods of use.
c. If creating outdoor shade is demonstrably infeasible or unsafe in the work area, the employer shall implement alternative cooling and control measures that provide equivalent protection to shade.
d. As an alternative to outdoor shade, and for indoor work settings, an employer may provide cooling with an indoor mechanical ventilation system or air conditioning provided that the indoor space satisfies the requirements of subsection (b)(2)–(5) of this section.

Drinking Water

a. An employer shall:
    i. Provide clean, potable drinking water at no cost to exposed employees;
    ii. Ensure the vessel holding the water keeps the water cool, clean, and prevents dirt, debris, and other materials from entering the water;
    iii. Make available at least 32 ounces of drinking water per hour to each exposed employee per work day;
    iv. Place drinking water in locations readily accessible to the employee;
    v. Ensure bathroom facilities are also readily accessible;

vi. Provide portable water vessels to workers or permit them to carry their own; and

vii. Provide, alongside, single-use cups or individual drinking containers.

b. An employer is not required to provide the entire drinking water supply at the beginning of an employee's shift but shall make drinking water available at all times while work is being performed.

Rest Breaks

a. Except when the heat illness prevention rest breaks coincide with an existing unpaid meal break, the heat illness prevention rest break is a work assignment and must be paid.

b. At minimum, an employer shall provide a rest period of at least 10 minutes for every 2 hours worked when the initial heat trigger is met.

c. An employer shall develop and implement a written heat illness prevention rest break schedule that protects employees exposed to a WBGT equal to or greater than 80˚F. Employers must choose and implement only one of two options below:

   i. Employer-designed heat illness prevention rest break schedule: Implement a written employer-specific, heat illness prevention rest break schedule using the minimum rest break durations and intervals of: (A) 10 minutes every 2 hours at a WBGT of 80˚F; (B) 15 minutes every hour at a WBGT of 90˚F; (C) 20 minutes every hour at a WBGT of 95˚F or greater; (D) 30 minutes every hour at a WBGT of 100˚F or greater; and (E) 40 minutes every hour at a WBGT of 100˚F or greater. When the WBGT exceeds 87˚F, employers should consider re-assigning non-essential work to times when the temperature is cooler. Employers must protect employees from heat illness by integrating the elements in subsections 1-4 into to their heat illness prevention rest break schedule, which may increase the duration or interval of the rest break beyond the minimum requirements to be protective.

      1. The effect of personal protective equipment (PPE) on the body's ability to retain heat;
      2. The effect of the type of work clothing on the body's ability to retain heat;
      3. The intensity of the work being performed; and
      4. Personal risk factors that put workers at a higher risk of heat related illness.

   ii. NIOSH work/rest schedule: Implement a written heat illness prevention rest break schedule using the [NIOSH work/rest schedule, adjusted].

d. An employer may coincide heat illness prevention rest breaks with a scheduled rest or meal period.

e. Rest breaks shall be taken in the shade in accordance with [section 7] of this standard.

f. An employee's rest break does not include the time needed to reach the rest area, don, doff, and properly store required PPE.

g. Employers shall encourage and allow employees to take additional rest breaks as needed to prevent heat-related illness; an employer may not discourage employees from taking preventive rest breaks as needed to prevent heat-related illness.

Emergency Response

a. An employer shall develop and implement an emergency response plan that includes procedures for:

    i. Ensuring effective and accessible means of communication at all times at the worksite to enable an employee to contact a supervisor or emergency medical services;

    ii. Responding to signs and symptoms of possible heat-related illness in employees;

    iii. Monitoring and providing care, including first aid as appropriate, to employees who are exhibiting symptoms of heat-related illness;

    iv. Contacting emergency medical services and, if necessary, transporting employees to a location accessible to emergency medical services; and

    v. Maintaining records of any heat-related incidents requiring medical intervention, including documentation of the environmental and work conditions at the time of the illness or injury.

b. An employee shall:

    i. designate at least one person at each worksite to contact emergency medical services when needed, and permit others to if that person is unavailable;

    ii. ensure that employees have a reliable means of contacting emergency services when needed; and

    iii. ensure, in an emergency, that emergency medical services are contacted, and provided all necessary information, as immediately as possible (including contact information and directions to reach the employee(s)), and that, if necessary, employees are transported to where responders can reach them.

c. An employee exhibiting signs or symptoms of heat illness shall be immediately relieved of all duties; provided rest in a shaded area, water, and appropriate care; monitored; and shall not be left alone or sent home without being offered onsite first aid and/or being provided with emergency medical services in accordance with the employer's emergency response plan.

Retaliation Protection

a. An employer shall not take an adverse action against an employee for any of the following:

    i. Exercising or asserting their rights under this standard;

    ii. Filing a complaint or participating in any investigation or proceeding related to this standard; or

    iii. Discussing employment conditions related to this standard with other employees, service providers, labor organizations, or other representatives.

Training

a. An employer shall:

    i. Provide initial heat stress training to employees and supervisors covered by this standard prior

to an employee's first exposure to heat;

ii Re-train employees and supervisors at least:
   1. Annually prior to exposure; and
   2. Immediately following any incident at the worksite involving a suspected or confirmed heat-related illness;

iii. During a heat wave, provide a refresher or tailgate training of employee protections under this standard and the signs and symptoms of heat illness.

iv. Present training in a language and at a literacy level each employee and supervisor can understand, including in multiple languages or in multiple sessions as needed;

v. Provide training in a manner that facilitates interaction and dialogue;

vi. Ensure that training for workers and supervisors includes at least:
   1. The work and environmental conditions that affect heat-related illness, including required clothing or PPE;
   2. The personal risk factors that affect heat-related illness;
   3. The concept, importance, and methods of acclimatization;
   4. The importance of frequent consumption of water and rest breaks in preventing heat-related illness;
   5. The types of heat-related illness, signs and symptoms of heat-related illness, and the appropriate first aid and emergency response measures;
   6. The importance of and procedures for employees immediately reporting to the employer signs and symptoms of heat- related illness;
   7. The employer's procedures and the requirements for complying with this standard; and
   8. The employee's right to be free from retaliation for exercising their rights under this standard.

vii. Ensure that supervisors receive additional training, prior to supervising employees performing work that should reasonably be anticipated to result in exposure to heat at or above the heat trigger. The additional training shall include:
   1. The procedures the supervisor is to follow to implement the applicable provisions in this standard;
   2. The procedures the supervisor is to follow when an employee exhibits signs or reports symptoms consistent with possible heat illness, including emergency response procedures; and
   3. How to monitor the WBGT and heat index.

viii. Maintain training records for one year from the date on which the training occurred. Training records shall include attendance, the date of training, the identity of the person who conducted the training, and a copy of the training materials used or a means to readily access such materials.

b. The training records required by this regulation shall include:

i. The names of the persons trained;

ii. The dates of the training sessions; and

iii. A summary or outline of the content of the training sessions.

c. The training records shall be made available to [relevant agency] upon request

Employer-Provided Housing

a. Beginning [effective date], rooms where people sleep must be able to maintain an indoor temperature of 78˚F or less (using air conditioners, evaporative coolers, air purifiers with coolers, or other reliable means) whenever the heat index or WBGT outside the housing units is at or above 80˚F degrees.

b. Safety in Housing Units Prior to [effective date]. Prior to [effective date], if rooms where people sleep are not able to maintain an indoor temperature of 78˚F or less (using air conditioners, evaporative coolers, air purifiers with coolers, or other reliable means), employers must take the following steps:

   i. Optimize the ability to keep housing cool by ensuring that windows can be protected from direct sunlight in a manner that minimizes radiant heat during all hours of the day, whether using natural or artificial shade, the provision of window coverings must deflect the sun and not simply absorb the heat, or other equally effective measures. Such measures must not interfere with the ability to open and close windows or create another hazard.

   ii. Make fans available at no cost for any housing occupants who wish to use them.

   iii. Provide an area(s) for occupants to cool off whenever the heat index outside the housing units is at or above 80˚F. The cooling area(s) must be large enough to allow use by at least 50 percent of the occupants at the labor housing at any one time and must use either or any combination of the following two approaches:

      1. Giving occupants continual access to one or more common rooms that are maintained at or below a temperature of 78˚F (using air conditioners, evaporative coolers, air purifiers with coolers, or other reliable means). This can be done by making use of existing common rooms, otherwise unused housing units, or other available indoor spaces that do not present additional risks to the occupants.

      2. Giving occupants continual access to outdoor rest areas (located away from work areas or activities that could create a hazard). The rest areas must:

         A. Be shaded by any natural or artificial means, so that occupants can sit or stand in a normal posture fully in the shade;

         B. Provide water misters, cooling vests, cooling towels, or equally effective means of relief. If relying upon items that can only be used by one individual at a time, enough must be provided to satisfy the 50 percent requirement and they must not be shared without being washed; and

         C. Locate available chairs, benches, and other seating in a manner that encourages use.

c. Temperature Awareness. To ensure that housing occupants can remain aware of the effects of heat on the indoor environment, both immediately and on an ongoing basis, employers must provide a thermometer that displays the temperature in both Fahrenheit and Celsius in each individual housing unit and a device that measures humidity.

d. Access to Emergency Services. Employers must ensure that occupants always have access to a working telephone that can be used to contact emergency services. An electronic device, such as a cell phone, may be used for this purpose only if reception in the area is reliable.

Endnotes

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17 *State Plans*, *supra* note 15.

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20 29 C.F.R. § 1953.3(b).

21 *See e.g.*, Cal. Lab. Code §§ 140, 142.3 (establishing an Occupational Safety and Health Standards Board with the power to adopt, amend, or repeal occupational safety and health standards).

22 *State Plans*, *supra* note 15 (providing the contact information for relevant state agencies).

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69 Qinqin Kong & Matthew Huber, *Explicit Calculations of Wet-Bulb Globe Temperature Compared with Approximations and Why It Matters for Labor Productivity*, 10 Earth's Future, Jan. 31, 2022, at 1, https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2021EF002334; Brenda Jacklitsch et al., *supra* note 69, at 114.

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72 *See* Or. Admin R. 437-004-1131 (5)(e); Md. Code Regs. 09.12.32.04.

73 *See Personal Protective Equipment*, AgriSafe Network, https://www.agrisafe.org/healthcare/personal-protective-equipment/ (last updated Nov. 2024).

74 *See* Or. OSHA, Personal Protective Equipment: Selecting the Right PPE for Pesticide Use (2025), https://osha.oregon.gov/OSHAPubs/1018.pdf.

75 *See e.g.*, Or. Admin R. 437-004-1131 (1) ("This standard applies whenever an employee performs work activities, whether in indoor or outdoor environments, where the heat index (apparent temperature) equals or exceeds 80 degrees Fahrenheit.").

76 Md. Code Regs. 09.12.32.04.

77 **7** Colo. Code Regs. **§ 1103-15:3.1.**

78 **7** Colo. Code Regs. **§ 1103-15:3.1.**

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81 *See Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings*, 89 Fed. Reg. 70698, 70708–32 (proposed Aug. 30, 2024) (Section IV. Heath Effects); *see, e.g.*, Margaret C. Morrissey et al., *Heat Safety in the Workplace: Modified Delphi Consensus to Establish Strategies and Resources to Protect the US Workers*, 5 GeoHealth, May 2023, at 9–12, https://doi.org/10.1029/2021GH000443; Glen P. Kenny et al., *Heat Exhaustion, in* Handbook of Clinical Neurology Volume 157: Thermoregulation 507 (Angrej A. Romanovsky ed., 2018).

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85 Cal. Code Regs. tit. 8, § 3395(c); 7 Colo. Code Regs. § 1103-15:3.2; Md. Code Regs. 09.12.32.07; Or. Admin. R. 437-004-1131(4); Wash. Admin. Code § 296-307-09740.

86 Or. Admin. R. 437-004-1131(2)(b).

87 7 Colo. Code Regs. § 1103-15:3.2(A).

88 Cal. Code Regs. tit. 8, §§ 3395, 3396.

89 29 C.F.R. § 1928.110(c). The standard also requires that water be dispensed in single-use drinking cups or by fountains. The standard further requires access to toilet and handwashing facilities. 29 C.F.R. § 1928.110(c)(iii).

90 *See e.g.*, Cal. Code Regs. tit. 8, § 3457.

91 *See* Michael N. Sawka et al., *Position Stand: Exercise and Fluid Replacement*, 39 Med. & Sci. in Sports & Exercise 377, 386 (2007), https://doi.org/10.1249/mss.0b013e31802ca597; Amy Urban, *Hydration: Are Electrolyte Drinks Better Than Water*, Univ. of N.H. (Sept. 14, 2023), https://extension.unh.edu/blog/2023/09/hydration-are-electrolyte-drinks-better-water; *see also* Margaret C. Morrissey et al., *supra* note 88, at 11.

92 *Heat Prevention >> Water. Rest. Shade.*, Occupational Safety & Health Admin., https://www.osha.gov/heat-exposure/water-rest-shade (last visited Nov. 13, 2025).

93 *See* Amy Urban, *supra* note 98.

94 *See* Michael N. Sawka et al., *supra* note 98, at 382–383 (noting that modifying factors such as sex, age, and diet affect an individual's needs).

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102 *See Heat Prevention >> Water. Rest. Shade.*, Occupational Safety & Health Admin., https://www.osha.gov/heat-exposure/water-rest-shade (last visited Nov. 13, 2025).

103 *Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings*, 89 Fed. Reg. 70698, 70752–54 (proposed Aug. 30, 2024).

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105 Cal. Code Regs. tit. 8, § 3395(d); 7 Colo. Code Regs. § 1103-15:3.3; Md. Code Regs. 09.12.32.06; Or. Admin. R. 437-004-1131(3); Wash. Admin. Code § 296-307-09735.

106 Cal. Code Regs. tit. 8, § 3395(d).

107 Cal. Code Regs. tit. 8, § 3395(d); 7 Colo. Code Regs. § 1103-15:3.3; Md. Code Regs. 09.12.32.06; Or. Admin. R. 437-004-1131(3); Wash. Admin. Code § 296-307-09735.

108 Md. Code Regs. 09.12.32.06.

109 Cal. Code Regs. tit. 8, § 3395(d); Md. Code Regs. 09.12.32.06; Or. Admin. R. 437-004-1131(3) (Oregon uses the term "practical" in lieu of "practicable"); Wash. Admin. Code § 296-307-09735.

110 7 Colo. Code Regs. § 1103-15:3.3.

111 Cal. Code Regs. tit. 8, § 3395(d); 7 Colo. Code Regs. § 1103-15:3.3; Md. Code Regs. 09.12.32.06; Or. Admin. R. 437-004-1131(3); Wash. Admin. Code § 296-307-09735 (Washington allows substitutions even in regular conditions).

112 Cal. Code Regs. tit. 8, § 3396(d)(1).

113 *See* Md. Code Regs. 09.12.32.04(D)(5) (An employer's heat-related illness prevention and management plan must include "[h]ow employees will be provided with sufficient time and space to rest in shaded or cool, climate-controlled areas to cool off[.]"); Or. Admin. R. 437-004-1131(8)(e) (The heat illness prevention plan must include "how employees will be provided sufficient space to rest in a shaded area or cool climate-controlled area, and where heat-affected employees may cool off and recover when signs and symptoms of heat-related illnesses are recognized[.]").

114 *See* Or. Admin. R. 437-004-1131(3); California Rural Legal Assistance, Comment Letter on Proposed Rule re Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings (Jan. 13, 2025).

115 *Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings*, 89 Fed. Reg. 70698, 70752 (proposed Aug. 30, 2024) (summarizing conclusions from the reviewed research).

116 *See* Brenda Jacklitsch et al., *supra* note 69, at 76–77.

117 Cal. Code Regs. tit. 8, § 3395(d)(3); Cal. Code Regs. tit. 8, § 3396(d)(2); 7 Colo. Code Regs. § 1103-15:3.5.5; Wash. Admin. Code § 296-307-09730.

118 Md. Code Regs. 09.12.32.04(D); Nev. Admin. Code R131-24 § 5, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf

119 Cal. Code Regs. tit. 8, § 11140, subd. 12.

120 7 Colo. Code Regs. § 1103-1:5.2

121 Nev. Rev. Stat. Ann. § 608.019.

122 Or. Admin. R. 839-020-0050(6).

123 Wash. Admin. Code § 296-131-020(2).

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128 Cal. Lab. Code § 226.2(a).

129 Cal. Lab. Code § 226.2(a).

130 Cal. Lab. Code § 226.2(a)(3).

131 Cal. Code Regs. tit. 8, § 3395(e); 7 Colo. Code Regs. § 1103-15:3.4.2.

132 Md. Code Regs. 09.12.32.08; Or. Admin. R. 437-004-1131(5)(e); Wash. Admin. Code § 296-307-09761.

133 Md. Code Regs. 09.12.32.08; Wash. Admin. Code § 296-307-09761.

134 Or. Admin. R. 437-004-1131(5)(e).

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141 *See id.* at 34.

142 *Prevention: Heat Hazard Recognition*, U.S. Dep't of Labor: Occupational Safety & Health Admin., https://www.osha.gov/heat-exposure/protecting-new-workers#:~:text=Almost%20half%20of%20heat%2Drelated,first%20week%20(Tustin%202018), (last visited Nov. 19, 2025).

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144 *Id. at* 34–36.

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146 Md. Code Regs. 09.12.32.05(A); Or. Admin. R. 437-004-1131(7); Wash. Admin. Code § 296-307-09745.

147 7 Colo. Code Regs. § 1103-15:3.4.1(E).

148 Guidance for Regulation R131-24AP: Heat Illness Prevention, *supra* note 48, at 5.

150 Cal. Code Regs. tit. 8, §§ 3395(h)(1), 3396(h)(1); Colo. Code Regs. § 1103-15:3.6.1; Md. Code Regs. 09.12.32.10(A)(4); Minn. R. 5205.0110(2)(C) (requiring training in accordance with part 5206.0700 subparts 1 and 3); Minn. R. 5206.0700(1), (3) (requirements for training programs concerning harmful physical agents); Or. Admin. R. 437-004-1131(9); Wash. Admin. Code § 296-307-09760(2).

151 Cal. Code Regs. tit. 8, § 3395(h)(B); Cal. Code Regs. tit. 8, § 3396(h)(B); Colo. Code Regs. § 1103-15:3.61; Or. Admin. R. 437-004-1131(9)(b).

152 Cal. Code Regs. tit. 8, §§ 3395(h), 3396(g); Md. Code Regs. 09.12.32.10; Minn. R. 5206.0700(1)(G); Nev. Admin. Code 618.540(1)(c); Or. Admin. R. 437-004-1131(9); Wash. Admin. Code § 296-307-09760.

153 7 Colo. Code Regs. § 1103-15:3.6.

154 Md. Code Regs. 09.12.32.10; Minn. R. 5206.0700(1)(G) ("[T]raining update may be brief summaries of information included in previous training sessions); Or. Admin. R. 437-004-1131(9); Wash. Admin. Code § 296-307-09760.

155 Cal. Code Regs. tit. 8, §§ 3395(h)(2), 3396(h)(2); Colo. Code Regs. § 1103-15:3.6.2; Wash. Admin. Code § 296-307-09760(3).

156 Md. Code Regs. 09.12.32.10(A)(5), (B), (C) (records maintained for one year; includes names of person trained, dates of the training sessions, a summary of contents); Minn. R. 5206.0700(1)(D) (records maintained for three years; includes dates of training; name, title, and qualifications of the person who conducted the training; the names and job titles of employees who completed the training; and a summary of the information included in the training session); Nev. Admin. Code 618.542(1)(c), (2) (records maintained for three years; includes attendance of employees participating in the training program); Or. Admin. R. 437-004-1131(10) (most recent annual training record maintained; includes name or identification of each employee trained, the dates of the training, and the name of the person who conducted the training).

157 *See generally* Emma Scott & Gray Norton, Precarious Protection: Analyzing Compliance with Pesticide Regulations for Farmworker Safety 34–41 (2023), https://www.vermontlaw.edu/wp-content/uploads/2024/07/precarious-protection.pdf; Int'l Brotherhood of Teamsters, Comment on Proposed Rule on Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings 18–21 (Feb. 3, 2022), https://www.regulations.gov/comment/OSHA-2021-0009-0707.

158 Or. Admin. R. 437-004-1131(9).

159 Md. Code Regs. 09.12.32.10; Wash. Admin. Code § 296-307-09760.

160 Cal. Code Regs. tit. 8, §§ 3395(h), 3396(h) (requiring "effective training"). Nevada's regulation also implies that language access is required but guidance from the state does not reinforce this obligation. Nev. Admin. Code R131-24, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf (a training program must "[p]rovide information to enable each employee receiving the training to recognize the hazards of heat illness"); Guidance for Regulation R131-24AP: Heat Illness Prevention , *supra* note 48.

161 *Heat Illness Prevention eTool: Training*, Cal. Dep't Indus. Rels., https://www.dir.ca.gov/dosh/etools/08-006/EWP_training.htm (last visited Nov. 13, 2025).

162 7 Colo. Code Regs. § 1103-15:3.6.4; Md. Code Regs. 09.12.32.10; Or. Admin. R. 437-004-1131(9); Wash. Admin. Code § 296-307-09760. Other state standards imply a language access requirement. Cal. Code Regs. tit. 8, §§ 3395(h), 3396(h) (requiring "effective training"); Nev. Admin. Code R131-24, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf (a training program must "[p]rovide information to enable each employee receiving the training to recognize the hazards of heat illness").

163 7 Colo. Code Regs. § 1103-15:3.6; *see Heat Illness Prevention Materials*, Univ. of Wash.: Pacific Northwest Agric. Safety & Health Ctr., https://www.deohs.washington.edu/pnash/heat-toolkit (Heat Education & Awareness Tools Facilitator's Guide); Occupational Safety & Health Admin., Heat Illness Prevention Training Guide: A Lesson Plan for Employers (2011), https://www.osha.gov/sites/default/files/osha_heattraining_guide_0411.pdf; *Heat Illness Prevention*, Western Ctr. for Agric. Health & Safety, https://aghealth.ucdavis.edu/training/heat-illness (last visited Nov. 13, 2025) (Heat Illness Prevention Employer Training Discussion Guides and Visual Aids).

164 Cal. Code Regs. tit. 8, §§ 3395(e); Colo. Code Regs. § 1103-15:3.5.2; Md. Code Regs. 09.12.32.08; Or. Admin. R. 437-004-1131(5); Wash. Admin. Code §§ 296-307-09747; 296-307-09750.

165 *See* Miranda C. Martin & Paul Monaghan, The Preventive Potential of Buddy Systems for Farmworker Heat Safety, https://floridafarmworkers.org/wp-content/uploads/2025/06/Buddy-System-Potential-Heat-Safety.pdf; Miranda C. Martin et al., *Dissemination of Heat Safety Practices Among Florida Farmworker Crews*, J. Occupational Env't Med., Aug 2025, at X, https://journals.lww.com/joem/abstract/2025/08000/dissemination_of_heat_safety_practices_among.15.aspx

166 Colo. Code Regs. § 1103-15:3.5.1–2.

167 Cal. Code Regs. tit. 8, §§ 3395(e); Md. Code Regs. 09.12.32.08; Or. Admin. R. 437-004-1131(5); Wash. Admin. Code §§ 296-307-09747; 296-307-09750.

168 Cal. Code Regs. tit. 8, §§ 3395(f); 3396(f); Colo. Code Regs. § 1103-15:3.5.3–4; Md. Code Regs. 09.12.32.09; Nev. Admin. Code R131-24 §§ 6, 10, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf; Or. Admin. R. 437-004-1131(4), (5); Wash. Admin. Code §§ 296-307-09730; 296-307-09750.

169 Or. Admin. R. 437-004-1305(4)

170 *See* Cal. Code Regs. tit. 8, §§ 3395(i).

171 *See* Cal. Code Regs. tit. 8, §§ 3395(i).

172 Cal. Code Regs. tit. 8, §§ 3395(i); 3396(i); Md. Code Regs. 09.12.32.04; Or. Admin. R. 437-004-1131(8); Wash. Admin. Code § 296-307-09730.

173 Cal. Code Regs. tit. 8, §§ 3395(i); 3396(i) (both rules require plans to be in English and in the language understood by the majority of employees); Md. Code Regs. 09.12.32.04; Or. Admin. R. 437-004-1131(8); Wash. Admin. Code §§ 296-307-09730 (requires plan to be available in a language that employees understand; includes provision of plans to an employee's authorized representative).

174 Nev. Admin. Code R131-24, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf.

175 Nev. Admin. Code R131-24 § 5, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf.

176 Nev. Admin. Code R131-24 § 6, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf.

177 Nev. Admin. Code R131-24 § 8, https://www.leg.state.nv.us/Register/2024Register/R131-24AP.pdf.

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180 20 C.F.R. § 655.122(d).

181 *See* Adam Wagner et al., *With No AC Where They Sleep, NC Farmworkers Risk the Heat Even After the Sun Goes Down*, Pulitzer Ctr. (Oct. 21, 2020), https://pulitzercenter.org/stories/no-ac-where-they-sleep-nc-farmworkers-risk-heat-even-after-sun-goes-down.

182 *Id.*; Sara A. Quandt et al., *Heat Index in Migrant Farmworker Housing: Implications for Rest and Recovery From Work-Related Heat Stress,* 103 Am. J. Pub. Health e24, e24 (2013), https://doi.org/10.2105/AJPH.2012.301135.

183 *See* 29 C.F.R. § 1910.142.

184 Or. Admin. R. 437-004-1120 (23)(a).

185 Or. Admin. R. 437-004-1120 (23)(b).

186 Or. Admin. R. 437-004-1120 (23)(c) & (d).

187 Or. Admin. R. 437-004-1120 (23)(e), (f), & (g). Colorado also incorporated worker housing in its heat illness prevention regulation, requiring employers to provide fans for all sleeping quarters in employer-provided housing when a worksite temperature of 95˚F is expected or occurs. Colo. Code Regs. § 1103-15:3.4.4.

188 29 U.S.C. § 660(c); 29 C.F.R. § 1977.3.

189 *See* Occupational Safety & Health Admin., Protection From Retaliation for Engaging in Safety and Health Activity Under the OSH Act (2025), https://www.osha.gov/sites/default/files/publications/OSHA3812.pdf.

190 *Id.*

191 *See e.g.*, Cal. Lab. Code § 6310; Md. Code. Ann., Lab. & Empl., § 5-604; Minn. Stat. § 182.654; Nev. Rev. Stat. § 618.445; Or. Rev. Stat. § 654.062; Wash. Rev. Code Ann. § 49.17.160.

192 Cal. Code Regs. tit. 8, § 3395 (Note No. 2); Cal. Code Regs. tit. 8, § 3396 (Note No. 2)

193 Cal. Code Regs. tit. 8, § 3395(h)(B); Cal. Code Regs. tit. 8, § 3396(h)(B); Colo. Code Regs. § 1103-15:3.61; Or. Admin. R. 437-004-1131(9)(b).

194 Colo. Rev. Stat. § 8-2-206; Colo. Code Regs. § 1103-15:5.1.

195 29 C.F.R. § 1977.3 (setting a 30-day window for filing a retaliation complaint under federal law);

196 *See* Colo. Rev. Stat. § 8-2-206 (3)(c).

197 Brenda Jacklitsch et al., *supra* note 69, at 15–22, 82.

198 *See* Emma Scott & Gray Norton, Precarious Protection: Analyzing Compliance with Pesticide Regulations for Farmworker Safety 55 (2023), https://www.vermontlaw.edu/wp-content/uploads/2024/07/precarious-protection.pdf.

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208 *See* Or. Admin. R. 437-004-1131(9); Cal. Code Regs. tit. 8, § 3395(h)(1)(A); Colo. Code Regs. § 1103-15.3.6.1(A).

209 *See* Brenda Jacklitsch et al., *supra* note 69, at 99–100.

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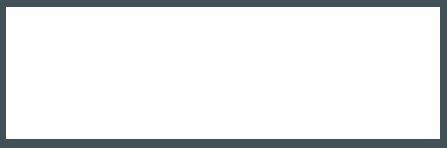

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