

Hot environments in HORECA

1. Introduction

Workers in the hotel, restaurant and catering (HORECA) sector are at risk of heat stress when unloading supplies, working in kitchens and while serving. Particularly in kitchens, cooking makes the environment hot and humid. In the summer, the situation can be far worse.

Feeling uncomfortable, however, is not the major problem. Workers who are suddenly exposed to a hot environment face extra and generally avoidable hazards. The employer should provide detailed instructions on preventive measures and adequate protection to prevent heat stress.

This E-Fact provides an overview of the factors that increase the risk of heat stress. It explains how to recognise and treat heat disorders, as well as detailing the benefits of implementing proper controls and work practices, especially in professional kitchens.

2. What is heat stress?

The temperature of the human body is normally between 36°C and 38°C. When the temperature rises above this range, the body reacts by circulating blood to the skin. This increases skin temperature and allows the body to release its excess heat through the skin. If the muscles are being used for physical labour, less blood is available to flow to the skin and release the heat. If the body continues to gain heat faster, and cannot release the heat by increasing blood flow to the skin and by sweating, the body temperature increases and the person experiences heat stress.

2.1 Heat stress causes body reactions

A worker's levels of stress, capacity to work and workplace safety are affected by four environmental factors:

- temperature
- humidity
- radiant heat such as from the sun or a deep fat fryer
- air velocity.



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An individual's personal characteristics such as age, weight, physical fitness, degree of acclimatisation, metabolism, use of alcohol or drugs and a variety of medical conditions such as hypertension all affect a person's sensitivity to heat.

The ideal working temperature is between 20°C and 22°C. As temperature increases, working capacity falls. Studies show that above 24°C working capacity decreases by 4% with every further degree¹.

If the temperature rises above 26°C, concentration drops, power is lost, mistakes occur, fatigue and exhaustion set in and, consequently, the number of accidents will increase.

Hot environments impair the mental alertness and physical performance of an individual. Heat tends to promote accidents.

3. Heat disorders and health effects

Excessive exposure to a hot working environment can bring about a variety of heat-induced disorders. Heat rashes and fainting are the first symptoms of heat strain. If heat stress is not recognised and treated in the early stages, it can have serious effects on the body, such as heat stroke, exhaustion and cramps.

The following is a description of the harmful effects of heat, starting with the most dangerous.

3.1 Heat stroke

Heat stroke and hyperpyrexia (elevated body temperature) are the most serious types of heat illnesses.

Cause: Heat stroke occurs when the body's system of temperature regulation fails, sweating becomes inadequate, and body temperature rises to critical levels. The body's only effective means of removing excess heat is compromised with little warning to the victim that a critical stage has been reached.

Symptoms: Signs of heat stroke include dry, hot or spotted skin (due to failure of sweating). Body temperature is usually 41°C or higher, the victim is mentally confused, becoming delirious with complete or partial loss of consciousness. The signs of



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heat hyperpyrexia are similar except that the skin remains moist.

If body temperature is too high, it causes death.

Treatment: Unless the victim receives quick and appropriate treatment, death can occur. A person showing of heat stroke requires immediate hospitalisation.

First aid should be immediately administered:

- the person should be placed in a shady area and the outer clothing removed
- the person's skin should be wetted and air movement around the worker increased to improve evaporative cooling
- fluids should be replaced as soon as possible. Offer sips of cool water, but only if the person is conscious.

Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death. People who have had heat strokes in the past and treated successfully may be more sensitive to the effects of heat in the first few months following the illness, but they do not have long-term problems.

3.2 Heat exhaustion

Cause: Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt.

Symptoms: Heat exhaustion includes several clinical symptoms that may resemble the early symptoms of heat stroke: heavy sweating, weakness, dizziness, visual disturbances, intense thirst, nausea, headache, vomiting, diarrhoea, muscle cramps, breathlessness, palpitations, tingling and numbness of the hands and feet. The body temperature is normal or only slightly elevated.

Treatment: Victims with mild cases of heat exhaustion usually recover immediately when they are removed from the hot environment and are given fluid replacement (salted if possible). There are no known permanent effects. Heat exhaustion should not be dismissed lightly, because the symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.



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3.3 Heat cramps

Heat cramps are painful spasms in the muscles that may occur alone or in combination with one of the other heat stress disorders.

Cause: These cramps have been attributed to an electrolyte imbalance caused by sweating. Cramps most often occur when people who are performing hard physical labour in a hot environment drink large amounts of water without sufficient salt (electrolyte) replacement.

Symptoms: Painful cramps in arms, legs or stomach that occur suddenly at work or after work hours. Those muscles are usually the ones most susceptible to cramps. Cramps can be caused by both too much and too little salt².

Treatment: It is necessary to distinguish heat cramps from common cramps, which occur during strenuous work. Common cramps are cured by rest and massage; heat cramps can only be treated by replacing the lost salt with salted water or commercial fluid replacement drinks.

4. Preventing heat stress

Most heat-related health problems can be prevented or the risk of them developing reduced.

In order to assess the heat strain of employees and to develop tailored prevention strategies, environmental heat measurements should be made at, or as close as possible to, the work area where the workers are exposed. When a worker is not continuously exposed in a single hot area but moves between two or more areas with different levels of environmental heat, or when the environmental heat varies substantially in a single hot area, environmental heat exposures should be measured for each area and for each level of environmental heat to which employees are exposed.

If an employee is exposed to a hot environment that could cause heat disorders, the employer should implement engineering controls to reduce exposure. If engineering controls are not feasible, the employer must provide administrative controls, such as breaks from work or training programmes and, if it could be useful, personal protective equipment.



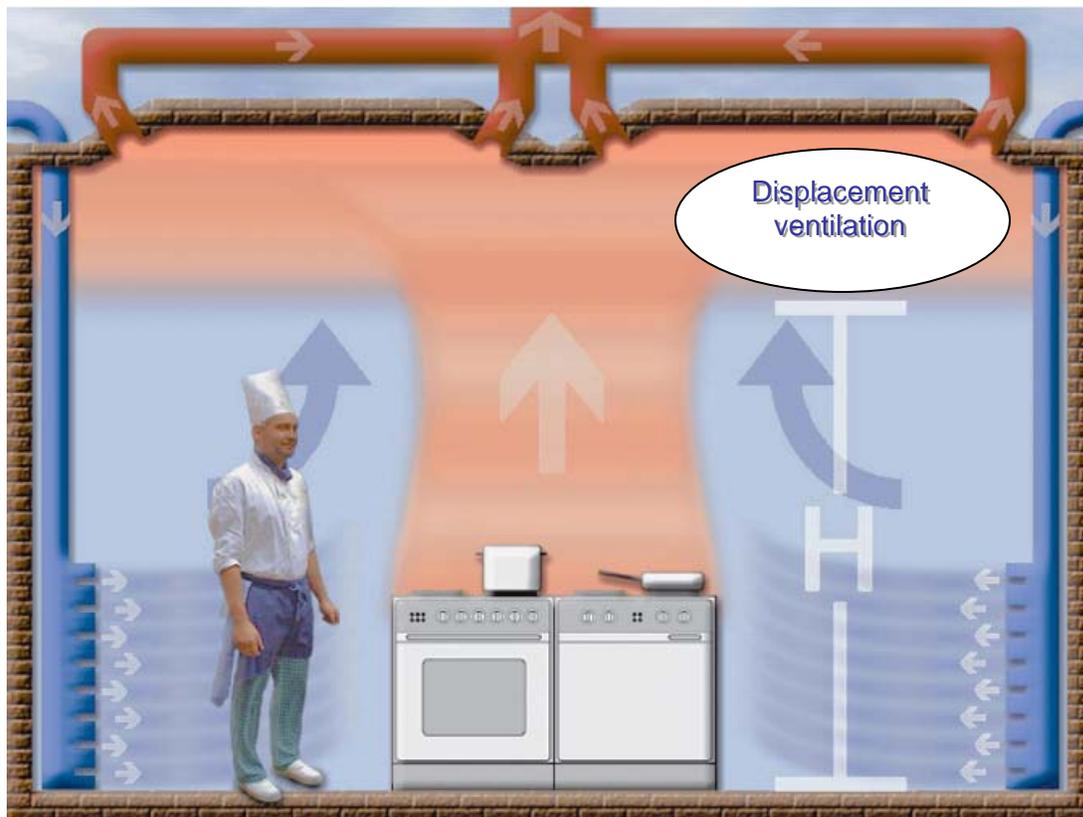
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The most effective protection from heat stress often combines various methods such as engineering and administrative controls, and personal protective equipment.

4.1 What kind of engineering controls can be utilised?

A variety of engineering controls including general ventilation, air treatment, cooling and conditioning may be helpful. The most effective and preferred means to cut excessive heat and cooking fumes containing dangerous substances in professional kitchens is displacement ventilation.

In a displacement ventilation system, air is introduced to the space at or near the floor level at a low velocity and at a temperature only slightly below the desired room temperature. The cooler air displaces the warmer air, creating a zone of fresh cool air at working level. Heat and contaminants produced by kitchen activities rise to the ceiling where they are pumped out.



Source: BGN



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Typically, displacement ventilation systems are more energy efficient and quieter than conventional overhead systems. They also provide better ventilation and thus improve indoor air quality.

Induction cooking — cooking with 'cold heat'. An induction cooker uses induction heating for cooking, based on magnetic fields. With no open flame, there is no excess heat introduced into the working environment. The risk of accidental burning is also diminished since the hob itself only gets slightly hot thanks to heat conduction downwards from cookware, allowing direct contact without harm. And, no heat is lost to the air directly from the hob, keeping the kitchen cooler.

Reduction of humidity — through air conditioning and dehumidifiers, and by diminishing the sources of moisture such as open water baths, drains and leaky steam valves.

The relative humidity in kitchen workplaces should not exceed the following values:

Room air temperature	Inside air humidity
20 °C	80%
22 °C	70%
24 °C	62%
26 °C	55%

4.2 What administrative or work practice controls may be used?

Acclimatisation

Acclimatisation can reduce heat strain in the HORECA sector. Workers who have had previous experience in jobs where heat levels are high enough to produce heat stress may acclimatise with a regimen of 50% exposure on day one, 60% on day two, 80% on day three and 100% on day four. For new workers, the regimen should be 20% on day one, with a 20% increase in exposure on each additional day³. Alternatively, instead of reducing the



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exposure time to the hot workplace, an employee can become acclimatised by reducing the physical demands of the job for a week or two.

Reduction of physical demands

Physical demands, especially in hot working environments, should be assessed to avoid unnecessary manual handling; for example, fitting the length of a hosepipe to a tap so that buckets can be filled at a convenient height or using automatic bulk handling machines or providing sack trucks.

Alternating work and rest periods

Rest periods in cooler areas can help avoid or alleviate heat stress. As the heat rises, increasing the frequency and length of breaks is advisable. If possible, heavy work, routine maintenances and repair work should be scheduled during the cooler parts of the day.

Fluid replacement

Employers are required to provide an adequate supply of cool drinking water close to the work area for workers exposed to heat. Employees should drink small amounts frequently; for example, one cup every 30 minutes. Fluids that contain caffeine or alcohol are not appropriate because they increase dehydration.

Personal protective equipment

Cool, comfortable, breathable clothing like cotton should be provided to allow air to move freely and sweat to evaporate.

Employee education

The key to preventing excessive heat stress is educating the employees on the hazards of working in heat and the benefits of implementing proper controls and work practices.

The employer should provide information about:

- signs/symptoms of heat-related illnesses. Dehydration, exhaustion, fainting, heat cramps, heat exhaustion, and heat stroke must be recognised by employees as heat disorders;
- factors that affect a person's sensitivity to heat such as age, weight and types of medication; .
- employees' responsibilities in avoiding heat stress;
- strategies for preventing heat stress, including the implementation of engineering controls, acclimatisation, reduction of physical demands, alternating work and rest periods and fluid replacement.

First aid workers should be trained to recognise and treat heat stress disorders.



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Conclusions

Workers in hotels and restaurants, and especially in professional kitchens, can suffer heat stress created by food production. To avoid health and safety being compromised, employees must be made aware of the hazards and risks of heat stress. Fortunately, there is a wide range of effective prevention strategies available that should be an integral part of employers' business management.

References

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 - ³ 'Criteria for a recommended standard occupational exposure to hot environments — revised criteria. Cincinnati, OH: US Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH. 1986) Publication No. 86-113.