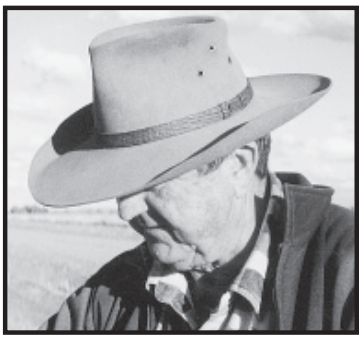
19. HEAT STRESS ON THE FARM

THE HAZARD

Every farmer and farm workers must be familiar with and learn how to deal with the condition of heat stress. However, heat stress is generally not desirable, and should be avoided where possible.

The body's temperature rises normally during hard physical work but is controlled mainly by cooling through the evaporation of sweat through the skin. The harder the work, the higher the body temperature and the greater the sweating. The body temperature is controlled by adjustments in sweating over a wide range of environmental conditions. As the environment gets hotter, this places added load on the blood circulation and there may be a further rise in body temperature. The sweat lost in cooling will result in dehydration unless replaced by drinking water. Heat stress commonly occurs due to:

- Physical work and activity
- High air temperatures
- Radiant heat such as heat from the sun, from a fire or from machinery
- High humidity
- Limited air movement
- Clothing and/or equipment



HAZARD IDENTIFICATION

When identifying heat stress as a hazard on the farm, consider characteristics of the worker, the work process, the environment and the interaction between them which increase the risk of heat stress.

Characteristics of the worker to consider are:

- Ill health, particularly heart or skin disorders
- Poor physical condition
- Overweight
- Age
- Dehydration
- Hangovers from excess alcohol and other drugs.

Characteristics of the work process to be considered are:

- The level of physical exertion required for the task
- Time of the day in which tasks are done
- The length of time spent working during hot weather
- The season in which the work takes place.

When considering the environment, look at:

- The amount of air movement
- Humidity level
- Air temperature
- Amount of radiant heat such as heat from the sun, a fire or machinery
- Presence of shade; artificial or natural
- The extent of reflection from work surfaces or water

To identify further hazards related to heat stress, refer to the following Health & Safety Guidance Notes:

* Machinery (Number 5)
* Ergonomics and Manual Handling on Farms (Number 6)
* Sun Safety on the Farm (Number 20)
* Woolshed Safety (Number 22)

THE RISK

1. *Who is at risk*

- All people who live or work on the farm during hot or humid weather. Those who undertake very strenuous jobs in hot weather are at even greater risk of heat stress.
- At special risk are shearers and others working in the woolshed during hot or humid weather.
- Others at risk include those who are undertaking pesticide application in protective clothing which does not allow free circulation of air.
- Older people and small children are at greater risk of heat stress due to their body's' imperfect cooling system.
- Those people who are unfit or unwell are at greater risk of heat stress.

2. *Nature of the potential injury/illness*

- Ill-effects of heat can range from mild heat exhaustion to heat collapse which may progress to heat stroke. Severe heat stroke, particularly in older people can cause death.

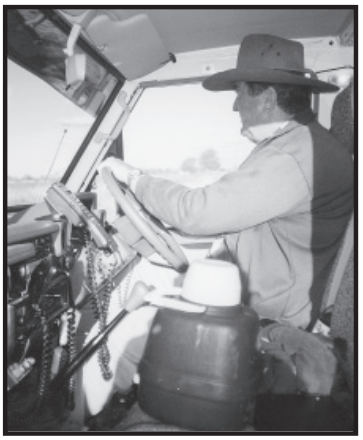
The Progression of Heat Stress

- Discomfort which may result in inefficiency, inability to continue with the days work and irritability.
- Reduced work capacity and productivity levels due to loss of concentration and fatigue.
- Increased incidence of injury and damage to equipment due to fatigue, poor concentration and unsafe work practices such as rejection of protective equipment.
- Disorders such as dehydration, heat exhaustion and heatstroke. At this stage, body temperature will be high as sweating stops. Loss of consciousness may occur.

3. *Degree of risk*

When assessing the degree of risk of heat stress, we consider the following questions:

- How common is heat stress on the farm ?
- How severe can heat stress be ?
- How often and for how long is the worker exposed to the conditions which cause heat stress ?



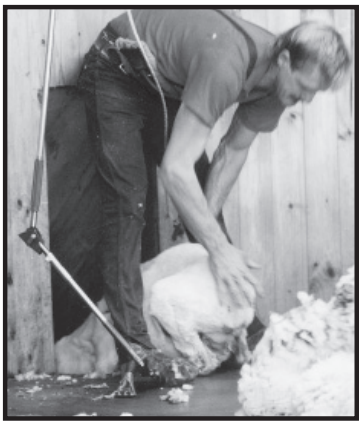
How common is heat stress on the farm?

Almost all people who work on a farm suffer some degree of heat stress at some time during the course of their work.

The degree of risk of heat stress will depend on the following features:

Features of the worker

- Very young people and very old people have body cooling systems which are inefficient. This increases the risk of heat stress for those people.
- Ill health, particularly heart and blood disorders increase the risk of heat stress. If the body is not functioning properly, the load placed on it by working in a hot environment may be too much and body temperature will increase.
- Likewise, where a person is unfit or recovering from illness, the body will not cope as well with heat as a fit person's. Therefore, the risk is increased.
- Overweight people will not be able to reduce their body temperature as well as people in the normal weight range. The risk of heat stress is higher for them.
- Many people are chronically dehydrated through not drinking enough fluid on a regular basis. This makes them more prone to heat stress. Dehydration also occurs where people have "hangovers" after excessive consumption of alcohol or other drugs. Therefore, working hard in the heat after a big night out greatly increases the risk of heat stress.



Features of The Work Process

- The higher the level of physical exertion needed for the task, the higher the risk of heat stress - eg shearing, other hard manual work.
- Where tasks are undertaken during the hotter hours of 10am-2pm (11am-3pm, daylight saving), the risk of heat stress is increased.
- The more time spent working during hot weather, the greater the risk of heat stress.
- Where work is carried out in summer, the risk of heat stress is increased.

Features of the Environment

- The less air movement; wind or ventilation in a building, the greater the risk of heat stress.
- The less air inside protective clothing (a micro-environment), the greater the risk of heat stress.

- The risk of heat stress increases with higher levels of humidity. Likewise, air temperature.
- The greater the amount of radiant heat; from a fire, the sun or machinery, the higher the risk of heat stress. For example, a person working on a header with inadequate air-conditioning on a hot day is more likely to suffer heat stress.
- Where there is inadequate shade, the risk of heat stress is increased.
- If work surfaces are absorbent such as where they are painted dark colours, there is a higher risk of heat stress.

How severe is the likely effect of heat stress?

Some degree of heat stress is very common on the farm, particularly during hot summer months. Mild symptoms of fatigue, headache, thirst and irritability may be experienced. The most severe effect is heatstroke or extreme dehydration. This can lead to death but is uncommon on Australian farms. However, even the mild symptoms can lead to lost productivity and the risk of injury from other sources.

How long is the worker exposed to the risk of heat stress?

The longer a worker has to work in the heat, the more likely it is that symptoms of heat stress will occur. Where the work is carried out over a long period, the risk is increased if regular breaks in a cooler area with a drink are not taken.

- **If the risk of heat stress is HIGH, action should be taken or planned as soon as possible.**

CONTROL MEASURES

- The following control measures will not be suitable for everybody. They are presented as options which are available to reduce the risk of heat stress while not interfering with farm productivity. In fact, well-designed control measures should increase productivity by decreasing human physical demands and reducing the cost of illness. An option which may seem impractical to one person in their particular situation may well be possible for somebody else in their circumstances. Where an option may not be practical at present, it may become so in the future; for instance, when planning the building of new sheds or animal handling facilities.

1. *Elimination of the hazard*

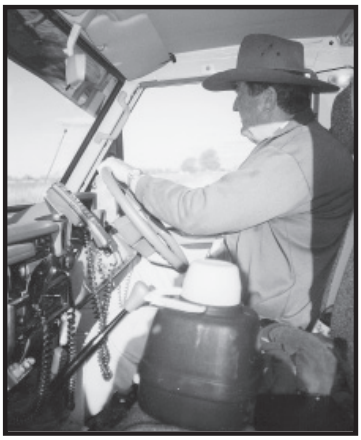
- When the weather is very hot or humid, eliminating the hazard could mean not working on that day.

2. *Substitution for a lesser hazard*

- Using the shed or outdoor area with the most ventilation and shade for the task is an example of substitution to reduce the risk of heat stress. Another example might be to use the harvester with the most efficient air-conditioning.

3. *Engineering/design*

- Good ceiling insulation and allowance for natural air flow in sheds. A ceiling of insulated zincalume with batts topped by colourbond will be the most effective. Higher ceilings and walls will also assist.
- Install reflective outer surfaces, particularly on the roof: Insulated zincalume or white, painted colourbond can be 10-20 degrees cooler than unpainted, weathered corrugated iron.
- Install rotating air ducts in the ceiling.
- Trees or tall shrubs can be grown to shade the hottest walls. Try to use fire-resistant varieties.
- Verandahs or awnings can be built to shade the sunny sides in summer.
- Artificial ventilation can be:
  - Evaporative cooling systems (these are ineffective in humid climates)
  - Air conditioning
  - Ceiling fans
  - Ducted air

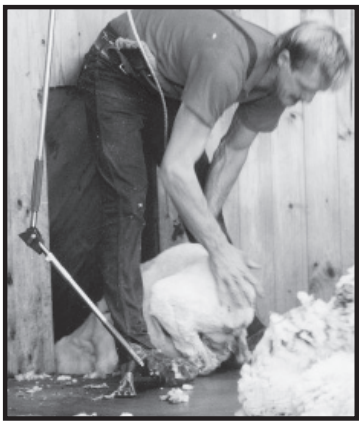


See also Guidance Note Number 22 - Woolshed Safety, for specific information relating to the woolshed

4. *Safer work practices and procedures*

- ✓ All workers need to be made aware of the risk of heat stress and educated about how to prevent it.
- ✓ Small children and babies need special attention in hot weather. They need to be kept cool and encouraged to drink regularly.

There are four important rules to avoid the ill-effects of heat stress:



- ✓ **Self pacing.** Work at a comfortable pace and take regular rest breaks.
- ✓ **Self monitoring.** Be aware of your own responses and feelings when working in hot conditions. If you feel unwell, stop work and move into cooler conditions immediately.
- ✓ **Drink frequently.** Water is the best choice.
- ✓ **Work plan.** Schedule heavy work for early in the morning or late afternoon to avoid the hottest part of the day and take a longer break in the middle of the day. Share the workload and alternate hot work with cool work. Try and plan ahead for work to be done in the cooler months.

See also Guidance Note Number 22 - Woolshed Safety, for specific information relating to shearing.

5. *Personal protective equipment and clothing*

- Clothing which is loose-weave and made of natural fibres like cotton allows sweat to evaporate. However, if time is being spent out in the sun, clothing must not be too open-weave or skin damage can occur. Clothing which is loose-fitting is cooler but the hazards of entanglement in machinery need to be kept in mind.

6. *First Aid*

- Any feeling of being unwell in the heat should be taken seriously and taken as a sign to stop work immediately and retire from the heat. Generally, with rest, cooling and drinking, recovery is rapid and uneventful although the victim should not return immediately to the hot situation.

In more serious cases, you may need to assist the affected person by:

- Removing the victim from the heat and lying him/her down in the shade.
- Removing as much as clothing as practicable.
- Cooling by sponging the skin with water and fanning.
- Encouraging to drink cooled but not cold water.
- Raising the legs if the victim is dizzy.

- If recovery is not evident, medical aid should be sought quickly. During this time cooling must be maintained as continued high body temperature may result in heatstroke which can be fatal.

RELEVANT LEGISLATION AND STANDARDS

Legislation:

The Occupational Health & Safety Act in each state or territory requires that the working environment should be safe and without risks to health, and that safe systems of work be provided. Training in prevention of heat stress, its identification and management is an important responsibility for farm managers.

Standards:

AS-1067. 1990 Sunglasses
AS-1067. 1983 Special Purpose Sunglasses
AS/NZS-2604. 1993 Sunscreen products
AS/NZS-4399-1996 Sun Protective Clothing
Various standards for thermal insulation

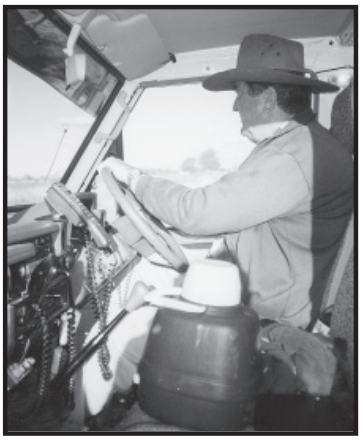
USEFUL REFERENCES

1. Pamphlet: *Protection from Sunlight*. Worksafe Australia. 1991.

2. Brotherhood, J. *Occupational Heat Stress:* Paper presented at the 10th Biennial Conference. Exercise and Thermoregulation. 28-30th September 1995.

3. Farmsafe Ontario Newsletter. *Don't Let the Heat Get You Down this Summer.* Vol. 19, No. 2. Spring, 1994.

4. Video: *Taking Control - A Sunburnt Country. Episode 4*. New South Wales Cancer Council.



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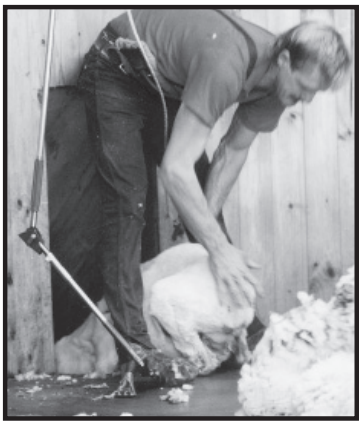
State/Territory Occupational Health & Safety Organisations as listed below:

* WorkCover New South Wales: Ph 131 050
* Victorian WorkCover Authority: Ph (03) 9628 8188
* Queensland Division of Workplace Health & Safety: Ph (1800) 177 717 or (07) 3247 4711
* South Australian WorkCover Corporation: Ph (08) 8226 3120
* WorkSafe Western Australia: Ph (08) 9327 8777
* Tasmanian Workplace Standards Authority: Ph (03) 6233 7657
* Northern Territory Work Health Authority: Ph (08) 8999 5010
* Australian Capital Territory WorkCover: Ph (02) 6205 0200



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