

Does anyone know if dehydration is ACTUALLY an issue for our Australian bushfire fighters?

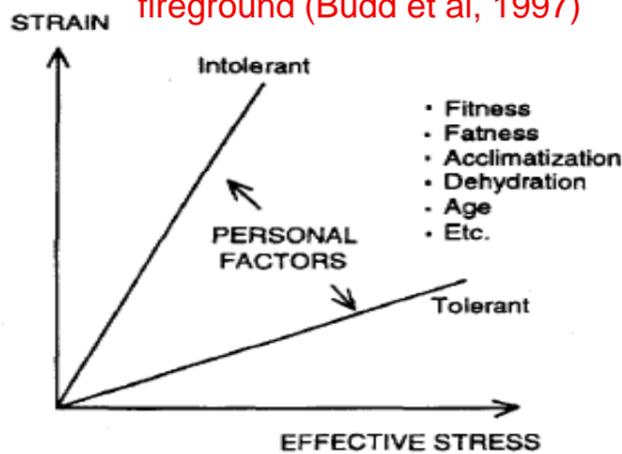
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WHY IS DEHYDRATION IMPORTANT?

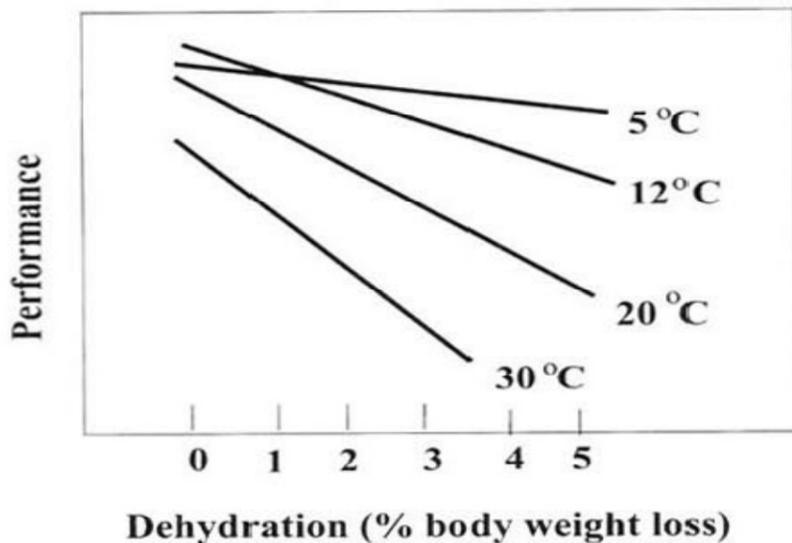
It has been hypothesized that dehydration can make firefighters intolerant to stress of working on the fireground (Figure 1).

Figure 1: Hydration alters the tolerance of firefighters to the effective stresses and strains associated with working on the fireground (Budd et al, 1997)



Indeed endurance (long duration) sports performance is reduced by dehydration as well as heat (Figure 2).

Figure 2: Aerobic performance deteriorates with dehydration and is exacerbated by higher ambient temperatures (Coyle, 2004)



Bushfire fighters may be faced with even greater temperatures than those depicted in Figure 2.

SCIENTIFIC EVIDENCE THAT BUSHFIRE FIGHTERS ARE DEHYDRATED:

- Firefighters arrive dehydrated ✓
- Firefighters leave dehydrated ✓
- Firefighting causes dehydration ✗

Despite the heat, work and wearing personal protective clothing - all which are thought to contribute to dehydration - there is a lack of evidence which shows firefighting causes dehydration.

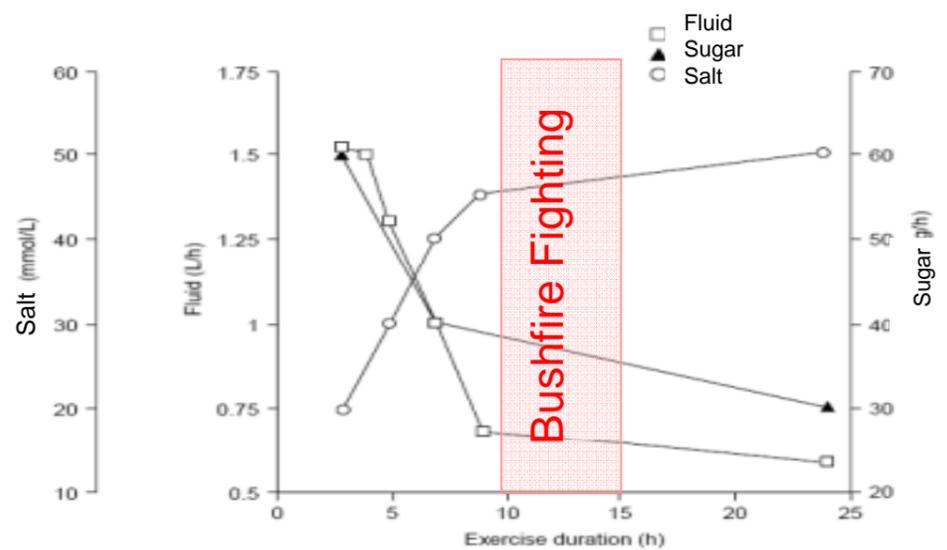
DEHYDRATION HAS BEEN SHOWN TO:

- ↓ stroke volume
- ↑ heart rate
- ↑ core temperature
- ↓ sweating / cooling
- ↓ decision making
- ↓ physical work output

OCCUPATIONAL HEALTH AND SAFETY:

Despite this lack of evidence, fire agencies have a responsibility to mitigate the potential risks imposed on their firefighters by prescribing fluid. Figure 3 provides a 'best guess' from the available scientific literature relating to sports performance.

Figure 3: Scientific recommendations for fluid consumption (Rehrer, 2001)



The range of fluid consumption volumes prescribed by Australian fire agencies is currently:

In a 12 hour firefighting shift, firefighters could be asked to consume **6 or 36 litres!**



THE IMPORTANCE FOR FIRE AGENCIES:

1. Are firefighters at risk of dehydration? **YES**
2. Is there published evidence? **NO**
3. Are fire agencies providing the *right* amount of fluid and advice to their firefighters? **NO ONE KNOWS**

REFERENCES:

Budd, G.M., et al., *Project Aquarius 1. Stress, Strain, and Productivity in Men Suppressing Australian Summer Bushfires With Hand Tools: Background, Objectives, and Methods. International Journal of Wildland Fire, 1997. 7(2): p. 69-76.*
 Coyle, E.F., *Fluid and fuel intake during exercise. Journal of Sports Sciences, 2004. 22: p. 39-55.*
 Rehrer, N., *Fluid and Electrolyte Balance in Ultra-Endurance Sport. Sports Medicine, 2001. 31(10): p. 701-715.*