VETS AGAINST LIVE EXPORT

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Dr Mark Schipp
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Re: Current DAWR heat stress thresholds are not supported by scientific and field data

Dear Dr Schipp

In the Department of Agriculture's[1] high mortality investigation reports, Heat Stress Threshold (HST) is defined as the maximum ambient wet bulb temperature at which the heat balance of the deep body temperature can be controlled using available mechanisms of heat loss. The Mortality Limit (ML) is defined as the wet bulb temperature at which animals will die.

Between 2006 and 2018, the defined HSTs and MLs for live export voyages has remained unchanged:
Standard Merino sheep: HST 30.6ºC; ML 35.5ºC
Adult *Bos taurus* beef cattle: HST 30ºC; ML 33.2ºC
Adult *Bos indicus* cattle: HST 32.5ºC; ML 36ºC

These figures were purportedly based on a 2003 industry publication (Maunsell 2003).[2] Key points in that document include the following direct quotes:

- The HST of *Bos taurus* animals lies between 28 ºC and 30ºC
- The HST of *Bos indicus* animals is probably greater than 32ºC wet bulb, but will reduce to this level if heat exposure is prolonged
- During voyage 1[3], the UCwbT [defined in the document as HST] for *adult sheep* varied between 28 ºC and 30ºC

[1] The term Department of Agriculture has been used for convenience. The name of this department has changed on multiple occasions between 2006 and 2018 eg AQIS, DAFF, DAWR
[2] See: http://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-mortalities/sheep-qatar-kuwait-uae-report-69 (Accessed 3. April 2018)
[3] Voyage data is from two voyages used to study investigate the effect of ventilation on heat stress in sheep during long-haul voyages to the Middle East. Voyage 1 was conducted during June/July 2002.

- During voyage 2[4], this parameter was estimated to lie between 26ºC and 30ºC, with the lower end of this range possibly being extended by animals that were compromised for other reasons (including disease)
- For *young sheep*, the UCwbT [HST] may be lower

It is concerning that despite these key points, the Department's HSTs for sheep and *Bos taurus* cattle were set at the upper limit or higher than HSTs supported by available data in 2003.

Even more concerning is that these HSTs have never been revised despite industry-funded, peer reviewed papers on heat stress in sheep and cattle . (Beatty 2005; Stockman 2006; Beatty et al 2006; Stockman et al 2011). In these experimental studies, animals were housed individually in large pens, with free access to feed and water, in rooms with good ventilation. The space allowances were greater than those prescribed under ASEL v 2.3 and the merino sheep used in the study by Stockman and colleagues (2006) had been summer acclimatised.

These experiments established the following data:
Adult merino sheep: HST 27ºC
Bos taurus cattle: HST 26ºC; ML of 30ºC in one animal
Bos indicus cattle: HST between 30ºC and 32ºC

The HSTs, scientifically demonstrated in best-case scenarios, are all lower than those currently used by the Department in analysing high mortality voyages. On live export voyages, space allocations are less, the stocking density is higher and the ventilation rate is variable in addition to other complicating variables (ship movement, restricted access to water etc). In the absence of other data, these scientifically derived figures from experimental models should be the absolute maximum used by the government in their definitions of HST.

One of the recent high mortality voyage reports (Voyage 69)[5] also provides evidence (in sheep at least) that these experimental figures (HST 26-27ºC) should be the maximum-accepted HST and not the current government defined figure of 30.6ºC. The veterinarian on that voyage described moderate clinical heat stress from day 5 to day 13, i.e. from a wet bulb temperature of 29.1ºC, with severe heat stress developing after that. As per previously-ignored high mortality voyage investigation reports, clinical heat stress, which indicates that the HST has been exceeded, always occurs at temperatures lower than the Department's defined HSTs.

Industry maintains they use the best scientific knowledge available to assess animal welfare. The fact that in 2018, the Department of Agriculture and Water Resources (DAWR), which regulates the trade, has chosen to ignore relevant scientific

[4] Voyage data is from two voyages used to study investigate the effect of ventilation on heat stress in sheep during long-haul voyages to the Middle East. Voyage 2 was conducted during September 2002.
[5] See: http://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-mortalities/sheep-qatar-kuwait-uae-report-69 (accessed April 3 2018)

evidence, suggests otherwise. If Australia is consistently claiming best animal welfare practice on live export voyages (Schipp 2013), then the scientific and field data cannot be ignored. The Department's HSTs for merino sheep and *Bos taurus* cattle must be urgently revised and lowered. They should not only take into account best-case scenarios but be applicable to all animals on a voyage (e.g. HST for adult sheep is higher than that for lambs on the same voyage; Maunsell 2003) and be adequate for animals that may already be stressed and/or diseased.

Yours sincerely

Dr Sue Foster BVSc MVetClinStud FANZCVS
Spokesperson

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