

27 February 2019



Technical Reference Panel (TRP) for the Heat Stress Risk Assessment (Live Animal Exports)
Department of Agriculture and Water Resources
GPO Box 858
CANBERRA ACT 2601

Dear Panel,

DRAFT Review of Heat Stress Risk Assessment (HSRA) in Australian Live Export

Sheep Producers Australia (SPA), on behalf of Australian sheep producers, appreciates the opportunity to provide feedback to the TRP about the draft recommendations for Heat Stress Risk Assessment (HSRA) provided in December 2018.

SPA has been contacted by sheep producers both individually and collectively via State Farming Organisations (SFO's) on this matter. The concerns raised have been in relation to both the welfare of their animals and the recommendations made in the draft Report.

Animal welfare has rightly been placed as the first consideration throughout this document.

SPA, in an effort to better inform producer opinions on the technical aspects of the trade, formed a Technical Advisory Group (TAG), to assess the science behind the recommendations made by the TRP. Details of who was engaged in the TAG are listed in Appendix 1.

SPA appreciates that the HSRA Review Panel and DAWR, will be receiving advice from many sources. The objective in forming the TAG was to have credible, cross sector experts, give evidence-based feedback on the Recommendations, to inform SPA and other stakeholders on the most important aspects and provide constructive points for inclusion in submissions.

The TAG was given a Terms of Reference, that emphasised a robust scientific approach, without "fear or favour". In other words, there were to be no predetermined outcomes.

In practice this meant that any scientific or technical findings in relation to animal welfare or any other matter, that could be seen or interpreted as potentially severely impacting on the ability of the live export industry to continue, were expected to be strongly included in the analysis and recommendations provided, (for example if the 28 WBT was seen as an appropriate parameter for regulation).

Summary of the key TAG recommendations

Specific details are contained in the remainder of this submission; however, a summary of the measures SPA recommends (and endorsed by the TAG are as follows):

1. Do not include any of the HSRA Review Panel Recommendations, in any interim changes to the regulations, as the scientific evidence is currently not conclusive enough to support these recommendations. This includes a lack of robust data on the length of exposure to high humidity events and subsequent respite from diurnal variation. It is well documented that heat stress results from sustained high WBT, not from exceeding a WBT per se.

2. Acknowledge that a 28C WBT at a 98% level of probability appears to be simplistic and not supported by strong scientific evidence (see Feedback on Heat Stress).
3. Move immediately, or as soon as practically possible to welfare parameters in the HSRA model. Any Welfare measure parameter that is used to regulate the trade should be accompanied by a lower risk percentile, given the lesser consequence to the animals and the greater variation in the observed data to this point.
4. Develop a specific set of Animal Welfare indicators to determine if an animal will suffer distress on a voyage. WBT is only a single part of a complex equation that involves for example; stocking rates, sourcing of animals, wool length, condition, length of exposure to high humidity and opportunities for potential recovery.
5. Given the issues raised with focussing on the 28CWBT, maintain the 2018 regulatory settings (as they appear to have clearly been effective), whilst the welfare measures are tested, including being moved from the laboratory to real on ship voyages. During this process, adopt a probability percentile of 90% instead of the current 98%.
6. Form and fund an expert cross-discipline scientific and industry panel to undertake further research, data analysis, technology assessment and modelling to strengthen scientific conclusions and future options. This research needs to include on board ship to test and validate hypothesis and modelling.
7. Continue the current summer moratorium and the measures put in place around that. The moratorium can only be relaxed if the point is reached, at which technology, especially “on ship” cooling, can alter the conditions to ensure heat risk is no greater than at other times of the year.
8. Limit the use of HSRA to adjustment of stocking rates from the ASEL allometric calculation as appropriate, until the model can be adjusted to a suitable welfare model.
9. Tighten the criteria of source properties. This could include standard protocols for source properties as well as being enhanced by similar protocols for agents and buyers. These protocols would take account of the seasonal aspects of the trade.
10. Institute vessel discharging protocols to avoid extended periods in high temperatures, to managing vessels waiting for a berth and to avoid multiple ports of discharge.

11. Implement a mortality threshold of <0.5% for reporting incidents and assessing what remedial action is required.
12. Accelerate and make mandatory the accreditation of ships for ventilation standards (per air turnover).

Potential longer-term measures are included at the end of this submission (Section 2: A pathway forward).

SPA welcomes any opportunity to work with DAWR on further refining these recommendations and their implementation. This would include on-going feedback requirements to ensure all stakeholders are not only aware of the 'rules' but also what is expected of them to ensure high standards of animal welfare.

The focus on a 28C WBT and 98% Percentile

The TAG concluded that the 98 percentile WBT upper limit used in the model may be neither consistent with the science available, nor provide the desired welfare outcomes. The TAG has subsequently made a number of suggestions to ensure that sheep are unlikely to experience poor welfare due to heat stress on ships and these suggestions are detailed below.

In addition to the findings of the TAG, SPA concluded that data exists from reliable sources such as independent observers on board ships that has not been considered in the current HSRA. This could provide evidence that a sustainable trade is possible, and can be continually improved as animal welfare indicators are refined, along the lines suggested by the TAG.

This differs in many respects from what has been put forward in the recommendations by the TRP which, if the exact details were followed, would make the industry unviable. The recommendations as they stand, are based on a narrow range of evidence, and do not provide sufficient detail over many issues, for industry to be able to operate with any certainty with regard to the impact of proposed changes. They fail to take into account the significant improvement demonstrated over the last six months, which shows the way forward for both (better than) acceptable animal welfare outcomes in the short and long term, as well as the development of a sustainable industry model.

1.0 Feedback on Heat Stress

1.1 Moving to Welfare Indicator

Recommendation 1 outlines a move from a framework based on mortality to one based on welfare, with Wet Bulb Temperature (WBT) the criteria to be utilised.

SPA supports the movement to a welfare-based system, with the qualification that a practical system of monitoring and reporting still needs to be developed for this to occur.

The TAG identified issues that at this point make it difficult to implement the recommendation and allow industry to comply, namely:

- Lack of detail around when or how the WBT will be determined on vessels, and which measurement tool will be utilised.
- No indication as to whether the WBT will be determined via an equation, based on the atmospheric temperature and relative humidity or another means.
- A lack of clarity regarding the aim of the welfare measure other than preventing mortality. (Note: The result could be that welfare standards will exceed any production system based on land). A causal relationship existing between core body temperature and respiratory rate is acknowledged, but the literature describes some variation between animals and within animals. A high respiratory rate is a way of removing heat and an animal only becomes stressed in a physiological sense when this response fails over time to remove sufficient heat to maintain body temperature. The extent to which the 98 percentile can account for animals using high respiratory rate to remove heat and subsequently recover is unclear.
- The Recommendation appears to present information about risk for “an animal” and not for a shipload of animals. There is insufficient information about the frequency of measurement, numbers of animals to exceed benchmarks, or location of animals on ship.
- The Recommendation does not appear to allow for possible respite associated with diurnal variation, and does not account for the need for continual high heat load to cause heat stress. It is well documented that heat stress results from sustained high WBT, not from exceeding a WBT per se.

Some of the language in the Recommendations compounds the ambiguity. For example, the northern hemisphere summer is defined as May to October. Heat stress simply equals excessive heat load, and the data used to calculate the 98 percentile is not described.

1.2 Determination of the WBT and the 98 percentile

SPA appreciates the objective of implementing these 2 measures. With the research that has been utilised, the TAG has identified that there is insufficient evidence that the heat stress on ship has been accurately predicted, (by the modelling presented) throughout a 12 - month period. The reasoning is as follows:

- Environmental data used for the 98 percentile WBT in the modelling appears to have been collected by volunteers on ships that are not necessarily live export vessels.
- Data from actual voyages would be better and may now be available from Independent Observer records.
- The actual level of heat stress is a combination of many factors including the individual animals homeostatic balance, the ambient conditions the vessel is in, and the ability to exhaust heat produced by the consignment of animal from the vessel. The differential between the WBT at air intake and exhaust from the vessel's ventilation is an important indicator as it can show how successfully the interventions are working to remove heat as the air moves through the vessel. There are also other tools the industry can use such as selection and preparation protocols that can change the population distribution curve and therefore the probability of heat stress occurring.
- Environmental data comparing animal observations (respiratory rate, temperature, behaviour) taken concomitantly to temperature records on board ships has not been presented in support of HSRA. Hence, the findings in animal house experiments about the relationships between environmental and physiological parameters and subsequently the model outputs have not been corroborated or tested with on board ship information. Model testing is a standard part of modelling. Whilst the statement is made on page 19 that recent monitoring corroborates the use of 28°C WBT, no data is presented to prove this. *(Please note: SPA has also been advised that heat respite and diurnal variations are relevant for much of the voyage, but the variations are reduced when crossing the equator. This indicates that the approximately 2-day equator crossing must be modelled separately)*
- Voyage data that exists from recent Independent Observer reports could form the basis of verifying animal house data with ship board data. This data has been collected at considerable cost to the industry.
- Some case studies, particularly those presented by the Australian Veterinary Association, describe voyages that have had high mortalities. Without a comparison to conditions across many voyages, the interpretation of the role of environmental conditions in such studies may be skewed to the worst-case scenario.

- Consistent with the modelling, industry experience suggests that the value of 28°C for WBT can be experienced throughout the year, particularly when vessels cross the equator. On some voyages where this has occurred mortalities have been low, with no reported impact on sheep welfare. Examination of ship board records could assist in determining whether such voyages were compliant with the 98-percentile risk, and to better predict when periods of high risk occurs.
- There is no apparent input for the length of time the WBT exceeds the threshold value or for periods of respite after such an event. The 98-percentile value may do this by default but is unlikely to predict whether temperature values occur continuously or not, and therefore do not predict the likely heat load on the sheep.
- The assessments of risk appear to take into account probability only and not the consequence of a high temperature event. More importantly the probability doesn't appear to have been adjusted to accommodate the change in consequence. Poor welfare as an important but lower consequence than mortality. If the consequence has been reduced the probability might also be increased with no change in the "risk".

SPA has consistently discussed the importance of sourcing animals and the induction process. From the data provided from the Independent Observer reports, this would be seen as a greater issue regarding 'risk' to sheep on board a vessel. The TAG appreciated that the use of this information in terms of animal welfare is unclear, but could be investigated.

1.3 Base Stocking Densities

Recommendation 4, relating to stocking densities to sheep type, the HSRA model and ultimately determined by ASEL is supported by Industry. SPA recognises that stocking rate is important as it drives the potential for heat production by a consignment of sheep by pure weight of numbers.

The reduction in the base stocking density (17.5%) will compliment other changes made to prevent mortality events and improve welfare. Some issues with stocking rates in the past have been associated with overloading. Better enforcement of regulations with a reliable head count should again assist with this recommendation and prevent mortality and welfare.

1.4 Future Refinements of the HSRA Model

SPA supports the concept of refining the model, especially in relation to the diurnal and day to day variations in deck WBT Data. The TPA must note that these refinements will depend on ship board validation and hence the trade continuing.

The current risk assessment could make the trade untenable for May to September, or possibly longer. Given the need to collect and refine any strategies implemented to improve

welfare, it will be essential to maintain the trade. The voluntary summer moratorium (June-August) by industry shows a commitment to improving welfare and minimizing heat stress events.

Given the work and conclusions of the TAG Group, SPA strongly supports continuation of the trade outside the summer months (June, July, August), with strong protocols that reduce the likelihood of mortality due to heat stress. Incremental improvements to animal welfare would be mandated as measurement technologies and protocols became available to do this. Implementation of the current TRP approach would jeopardise this approach. There could be no opportunity to refine the model if in the interim the trade was terminated by default, as a result of the risk assessment modelling.

1.5 Care beyond the voyage

SPA is concerned about the welfare of sheep throughout the supply chain, and have been strong supporters of having the Export Supply Chain Assurance System (ESCAS) in place. Consideration of the conditions at the port of discharge are important to note, and from interaction with other industry stakeholders, SPA is aware that putting measures in place to move sheep through the port of discharge as quickly as possible to minimise potential exposure to heat.

SPA appreciates that other research is being conducted within the importing countries (that the HSRA Review Panel is already aware of), including refining many variables that affect the 'heat load'. Factors in the importing country include stocking rates, shade levels, ground wetting (in lower humidity regions), and ensuring interventions are made to mitigate the impact of heat stress. As with all parts of the supply chain SPA expects all stakeholders to strive for continual improvement in animal welfare.

The TAG has identified, however, that the same issues apply about the measurement of welfare and prediction of the risk of poor welfare at a discharge port, as on ship. SPA recognizes potential risks in any supply chain and will work with DAWR and other stakeholders to minimise any risks that are raised.

1.6 Measurement and recording of conditions

How and where to deploy monitoring equipment, in an effort to standardise the industry and how it is benchmarked, is vital. The TAG had identified this as an important step in standardising measurement protocols.

1.7 Other on Board Factors

With a change in approach to how voyages are monitored and evaluated, there will be increased variability in predictive results as databases are developed and refined. The TAG has

identified ship and ventilation design as a major factor. Verified standards and protocols are needed to make the development of predictive models workable.

2.0 A Pathway Forward

Given the complex nature of how best to deal with the possibility of Heat Stress on a voyage, the TAG has developed some points to ensure animal welfare standards are upheld, along with using what resources are now available to ensure the continuous improvement necessary as the industry continues.

These points are designed to implement a best practice approach that is consistent with ensuring appropriate animal welfare and reducing the mortality risk due to heat stress to very low levels. These include:

- Continue moratorium until the point is reached, at which technology can alter the conditions to ensure heat risk is no greater than at other times of the year. Limit the use of HSRA to adjustment of stocking rates from the ASEL allometric calculation as appropriate, until the model can be adjusted to a suitable welfare model.
- Tightening the criteria of source properties. This could include standard protocols for source properties as well as being enhanced by similar protocols for agents and buyers. These protocols would take account of the seasonal aspects of the trade.
- Vessel discharging protocols be instituted to avoid extended periods in high temperatures to managing vessels waiting for a berth and to avoid multiple ports of discharge.
- Mortality threshold of <0.5% for reporting incidents and assessing what remedial action is required.
- Accreditation of ships for ventilation standards (pen air turnover). Ship board research to validate modelling.

Using the information provided by the TAG and other consultations, SPA would further recommend:

- Given the issues raised with focussing on the 28WBT, SPA recommends that the 2018 regulatory setting be maintained (as they have clearly been effective), whilst the welfare measures are tested, including being moved from the laboratory to real voyage tested.
- If regulation must be changed in the short term, moving to a regulation based on welfare rather than mortality, means that the consequence of the outcome is

- reduced. This creates more tolerance in the likelihood parameters, whilst still improving the outcomes for sheep on vessels. In addition to issues pointed out in 1.2, it is logical for the percentile for the chance of occurring to be reduced to 90 per cent, given the variation introduced with the initial welfare-based model, and the improved consequences.
- As an option to the Recommendations, SPA proposes that an outcome is regulated rather than putting in place a specific temperature setting. WBT is only a single part of a complex equation that involves stocking rates, sourcing of animals, wool length, condition, and others that play an important role in determining if an animal will suffer distress on a voyage.

If parameters are instead placed on an outcome, the exporters and vessel operators can work together on all the contributing factors, to minimize the risk to the animal. The actual outcome can also be verified by the Independent Observers placed on the vessels.

In the longer term, SPA suggests:

- A revision of the HSRA model used to predict risk and amend acceptable shipping periods (months of the year) once available. The revision should include adjustment to risk probabilities and consequences appropriate for animal welfare outcomes and validation of model outputs with animal data collected on ship (verified by the Independent Observer).
- Develop standards for measurement instruments and protocols using a proof of concept approach on board ships.
- Mandate compulsory measurement and data reporting once protocols are proven.

SPA acknowledges the importance of the reviews that have been put in place to evaluate what is required to have a sustainable industry. This submission has focussed on the Recommendations of the TRP, however we would encourage consideration of the submissions from other stakeholders, including the SFO's that will outline the hardships to be endured by producers and the rural communities in which they live and trade, if the recommendations go ahead as they stand.

SPA does not believe it was the intention of the TRP to close down this industry based on this Review. The performance of the industry over the past 6 months should serve as an example of what can be achieved, and the Independent Observers are now in place to ensure the industry can recover and be a sustainable option for sheep producers in Western Australia and South Australia,

Your sincerely



Graham Smith
Chief Executive Officer
Sheep Producers Australia

Background

Sheep Producers Australia (SPA) represents sheep and lamb producers in Australia and provides a mechanism to bring a diverse range of issues and needs to the policy making process. SPA draws on many formal and informal processes to achieve this. Principal amongst these is input from the state farming organisations, which have extensive networks within their jurisdictions.

As the recognised peak body for the sheepmeat industry under the *Australian Meat and Livestock Industry Act 1997* (the Act), SPA sets the strategic objectives to be pursued by the levy funded organisations Meat and Livestock Australia (MLA), Animal Health Australia (AHA), and the National Residue Survey (NRS), examining and approving their programs and budgets. We are involved in priority setting for industry research and development and marketing activities both domestically and internationally as set out in the Red Meat Memorandum of Understanding (MoU). Under the MoU, SPA assesses the performance of services delivered by expenditure of lamb and sheep levies.

The objects of SPA are;

- to represent and promote the interests of Australian sheep and lamb producers;
- to carry out activities necessary for the advancement of the sheepmeat and live sheep export industries;
- to collect and disseminate information concerning the sheepmeat and live sheep export industries;
- to co-operate with industry stakeholders and organisations at the state and national level and overseas;
- to maintain interaction and co-operation with its Members, relevant Government departments and authorities at Federal, State, and local government levels, and with other relevant industry organisations;
- to promote the development and resourcing of the agricultural and pastoral industries of Australia;
- to act as the Prescribed Body for the sheepmeat industry in Australia within the Red Meat Industry MoU under the Act;
- to oversee the implementation of the Sheepmeat Industry Strategic Plan (SISP).

Appendix 1: Technical Advisory Group Members

Professor Bruce Allworth,
Director, Fred Morley Centre,
Professor in Livestock Systems,
School of Animal and Veterinary Sciences Charles Sturt University

Assoc. Prof. John Gaughan,
School of Agriculture and Food Sciences
The University of Queensland

Dr. Robin Jacob
Department of Agriculture and Food (WA)– Livestock Innovation

Steve Meerwald
Chief Executive Officer at Harmony Agriculture and Food Company Pty Ltd

Sue Middleton
Executive Director, Brennan Rural Group
2010 Rural Women of the Year

This group has spent considerable time, often on a daily basis, during the last two months researching, collecting evidence, debating and finally recommending a series of what it believes are strong, evidence-based considerations for the Industry to consider.