Submission in Response to the Draft Report by the Heat Stress Risk Assessment Technical Reference Panel

Introduction

This submission by the Australian Livestock Exporters Council (ALEC) is made in response to the Draft Report by the Independent Heat Stress Risk Assessment Technical Reference Panel (TRP) published in December 2018. It is an accompanying submission to that provided by LiveCorp, a submission that is supported by ALEC.

ALEC's specific responses to the TRP's recommendations are contained in Attachment A

About ALEC

ALEC is a member-based, peak industry body representing Australia's livestock export sector. It sets industry policy, provides strategic direction to the industry and represents Australia's livestock export trade in Australia and internationally.

ALEC members account for more than 96 per cent of Australia's annual livestock exports, by volume and value. ALEC's membership also extends to supply chain participants including registered premise operators, ship owners, feed suppliers and other service providers to the trade.

ALEC's Overall Position on the Draft TRP Recommendations

ALEC is opposed to the TRP's draft recommendations related to the 28°C WBT threshold for the standard animal and use of the HSRA adjustment factors for other animals. There is a need for the TRP to engage more meaningfully with industry in developing a solution – one that is based on industry's extensive science and knowledge on managing heat stress on vessels.

The TRP's draft recommendations in terms of imposing a condition on the trade for standard sheep that there must be less than a 2% chance that the maximum WBT temperature encountered during a voyage will exceed 28°C will close the trade for almost all the year.

Even more unworkable is the TRP's recommendations applied to lambs. Trade in lambs will be impossible at any time of the year, even in northern hemisphere winter months (further details are contained in the LiveCorp submission). About one-third of the current trade are lambs, while the remaining two-thirds are sheep of considerably lighter weights than the TRP's 56kg animal. Indeed, some recent shipments to Gulf destinations have involved almost 50% lambs, partly as a result of customer demand and partly due to the changing age profile of the Australian flock.

Many locations in Australia would not meet the criteria imposed by the TRP. The TRP argue that in inland areas of Australia, conditions cool at night. However, this is irrelevant since the TRP's recommendations on threshold temperatures do not reference duration or respite; they only reference

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98 percentile maximum temperatures. In several areas of Australia 98 percentile maximum temperatures would exceed 28°C.

All the considerations above certainly highlight that significant work must be undertaken to further understand the diverse range of factors that contribute heat stress conditions. Seeking to arbitrarily regulate one of these factors is clearly an inadequate and misguided.

Evidence is provided in the LiveCorp submission, by Professor Maloney and by Sheep Producers Australia Technical Advisory Group that these recommendations do not have due regard for the complexity of the subject matter under study and without undertaking extensive verification of results obtained from a narrowly constructed experiment.

We also have reservations about the TRP's composition, particularly instances of predisposition against the trade. We are also concerned that the TRP has exhibited an unwillingness to engage with industry experts following the release of the draft recommendations and ALEC is deeply concerned the TRP may be unwilling to shift away from their draft recommendations despite overwhelming evidence that a different approach must be taken.

ALEC supports a move to emphasising and assessing on-board welfare outcomes. The move to measures of animal welfare rather than mortality is a challenge the industry has embraced and will continue to work hard to meet the regulatory objectives of Government. To this end ALEC is strongly supportive of the animal welfare indicator work being funded by LiveCorp, and it is for this reason it is critical that the TRP works in close consultation with Livecorp in finalising its report.

ALEC seeks to progress an innovative and proactive regulatory solution for the industry managing heat stress on voyages to and through the Middle East, considering the available science, best management practices and practical observations.

An Innovative Regulatory Approach

A possible pathway forward is accepting the TRP's analysis that open-mouth panting represents unacceptable animal welfare and in turn the industry is regulated to achieve this outcome with pant-score becoming the discernible measure that is regulated and reported.

To be effective this measure would need to incorporate duration, as in the period in which animals pant, the pant score and the percentage of animals that are panting. Panting is a behaviour that is particularly associated to sheep and therefore this solution applies solely to live sheep shipments.

ALEC believes such a solution abides by the spirit of both the McCarthy review and the TRP's recommendations, achieves an outcomes-based regulatory solution, builds on measures, but avoids ambiguity as to whether a single or a population of sheep are experiencing the effects of heat at a singular and specific wet bulb temperature.

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Noting wet bulb temperature is not a measure of welfare itself, it assumes a range of welfare challenges are experienced. Therefore, moving to a pant score offers a solution based solely on the welfare.

An outcome based regulatory regime still offers scope for HSRA to be utilised as a due diligence measure that can be continually refined based on new knowledge, available science and practical outcomes.

ALEC is proposing that welfare may have been compromised for the voyage and therefore subject to investigation if a certain percentage, at least 50 per cent, of sheep on a shipment open mouth pants for more than 48 Hours. Such an instance must be reported by the exporter to the regulator if it occurs.

For instance, a regulation could be enacted that open mouth panting for the average sheep cannot occur for more than 48 hours. A condition of being granted an EOI would be the exporter demonstrating due diligence in avoiding open mouth panting.

If open mouth panting of more than 48 hours is observed by the Independent Observer an investigation would be triggered. If through this investigation the exporter is found not to have exercised due diligence or has been careless the regulator would need to act within its powers to address this.

Regulating directly on open mouth panting builds on measures already implemented by the Government. A key plank in regulating panting scores directly would be the role of Independent Observers. The newly created Animal Welfare section in the Department may also have a role.

Over time direct regulation of welfare outcomes could be expanded to embrace items like identification of those not feeding or drinking, health issues, etc.

Regulating directly to open mouth panting will also be more easily communicated to the general community than use of the HSRA model or threshold wet bulb temperatures, will result in the acquisition of more knowledge in any area where scant knowledge currently exists, and is likely to result in better welfare outcomes (since the outcome is directly regulated rather than regulations being framed around inputs or processes that may only be indirectly or partially associated with the outcome).

The Need for Outcomes Based Regulation

Regulating for open-mouth panting is also consistent with regulatory best-practice in being outcomes focussed.

The Australian Productivity Commission recommends that, where possible, outcomes-based conditions be the default approach to regulation. It also represents the approach that the Government and Department said it would adopt in the current ASEL Review (of which the HSRA Review is a part).

Benefits from specifying required outcomes in regulations, rather than required inputs or processes (as is the case with prescriptive regulation), include the following:

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- It allows individual operators to meet the regulation in different ways using methods tailored to circumstances. In contrast specifying inputs and processes in regulation implies a 'one size fits all' approach.
- It encourages innovation. Often superior outcomes are achieved more effectively when they are specified directly in regulation.
- It encourages management to continually monitor the required outcome and adopt flexible, adaptive approaches to ensure it is being met. This contrasts with management merely being concerned that they have met regulatory requirements in terms of inputs and processes.
- It may improve community understanding of the regulatory objectives, by clearly linking regulation to the desired outcome (in this case, the desired animal welfare outcome).

Specifying the required outcome directly in regulation is particularly pertinent to a consideration of heat stress. A myriad of factors potentially influences welfare outcomes on a voyage when hot environmental conditions are encountered. These include:

- Careful selection of livestock. Also, vitally important is astutely using time spent in registered premises to prepare livestock for the journey.
- Using the first few days of a voyage preparing for the prospect of hot weather.
- Evening out stocking densities and opening pen areas so that the stock have the most favourable access to watering points and ventilation outlets .
- Making sure water troughs are well maintained, preventing any leaks that will increase humidity and affect the manure pad. Making sure that the troughs are filled to an appropriate level (not too much and not too little).
- Maximising ventilation and airflow wherever possible and opening hatches or doors that will improve airflow.
- If any black spots are identified making use of auxiliary fans.
- On ships with open decks proceeding in a zig-zag fashion to take advantage of cross winds.
- Progressively obtaining weather forecasts for upcoming days and if hot weather is forecast put in place mitigations steps.

Specifying the outcome in regulation also avoids the problem of undue focus on the HSRA model – the HSRA determination of stocking densities represents only part of the complete suite of activities that need to be undertaken to avoid or minimise welfare impacts from hot environmental conditions.

Shortcomings of the Draft Report and the Need for Further Work

ALEC is also not opposed to changes to the HSRA model but is insistent that any changes be made based on rigorous science that is validated in real world conditions.

Changing the focus of the HSRA model to one that incorporates dimensions of animal welfare other than mortalities will take time since it necessarily involves building in concepts such as duration and respite.

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As evident from the TRP's draft report, there is a pressing need simply to build knowledge in this area, let alone apply it in a practical situation. Perhaps one of the TRP's most revealing statements is: "*How cool it must get, and for how long, to enable sheep to 'dump' heat, is unknown."*

In terms of heat stress in live sheep voyages to and through the Middle East, the Panel has defined two unacceptable animal welfare outcomes:

- when core body temperature rises more than 0.5°C; and
- when sheep pant with an open mouth without a reduction in panting through the day and night.

In a practical sense, on board rises in core body temperature for individual sheep cannot be observed. Even if it could be observed, core body temperatures in individual sheep (as for humans) can vary considerably, depending on when measurement occurs:

- Body temperature varies naturally by time of day.
- It can vary due to water and food intake.
- It can vary due to exercise and activity.
- It can vary depending on environmental temperature.

Similar examples of temperature variations, but applying to sheep, can be readily found in the literature (refer to articles referenced in ALEC's submission to the Issues Paper). Across individual sheep variations in body temperature of 38.1°C to 40.0°C are not uncommon.

The natural variations in core body temperatures highlighted above are large compared to the minimal 0.5°C rise defined by the Panel as comprising unacceptable animal welfare.

Certainly, Professor Shane Maloney, a distinguished Australian expert in heat stress and thermoregulatory mechanisms in animals, and an expert the Panel relied upon extensively in the draft report (with liberal use of material that Professor Maloney had co-authored), disagrees with the 0.5°C threshold. He argues instead that a 1.0°C threshold should be used (Professor Maloney's paper is available in the LiveCorp submission).

Professor Maloney states that *"Panting has gained the reputation of being unsustainable because it is energy demanding, …. but except perhaps in extremis, that is generally not the case. Because the muscular activity of panting is so economical and because its low energy requirements are offset by energy savings in other muscles, panting in sheep and oxen is achieved with little or no detectable increase in whole-body metabolic rate".*

In other words, Professor Maloney, arguably Australia's pre-eminent expert in this area, does not regard panting as an issue except *in extremis.* What qualifies as *in extremis* is open to consideration, but it has been suggested should involve more than 48 hours of open mouth panting.

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The Panel then went on to link a 0.5°C rise in body temperature / open mouth panting with a wet bulb temperature of more than 28°C (for a standard sheep). This link was created based on one small experimental study which only involved a handful of sheep.

If the aim of this experiment was to recreate the environmental conditions on a voyage to and through the Middle East, it failed – environmental conditions on board a vessel are distinguishably different from those used in the experiment in the following ways:

- The type of animals currently traded – the 56kg animal used in the experiment is rarely traded in the current environment.
- The number of animals included – a handful of sheep, not a mob.
- Surrounding materials – there is no evidence that similar structures to those on live export vessels were used in the experiment.
- Dry bulb temperatures – a dry bulb temperature of 40°C was used in one of the experiments and 37°C was used in another. These ambient temperatures may represent conditions encountered in the northern summer, but not over all the year.
- Ventilation - with only 15 air changes per hour in the experiment versus much higher rates than this on-board vessel, remembering sheep are mostly bare shorn.
- Possibly most importantly, diurnal fluctuations in temperatures – temperatures in the experiment were increased and then held constant at high levels while diurnal temperature variations exist on live export voyages, even at the equator. Professor Maloney believes this may be a critical difference between the experimental conditions and those encountered in the real world.

It also ignores the fact that outcomes from this experiment, and from the Panel's analysis, are not supported by real world observations. A requirement on the Panel was that real-world observations be used. Part of the Panel's Terms of Reference are to "*examine on-board vessel data from livestock export voyages through Independent Observers and Australian Government Accredited Veterinarian (AAV) reports and other relevant data*".

We fail to see where this task has been undertaken.

Even if this was not part of the TRP's Terms of Reference it is normal practice to verify results from an artificial experiment or model against real world observations. It again points to significant flaws in processes followed by the Panel that this has not occurred. Model testing is a standard part of model development.

Whilst the statement is made on page 19 of the draft report that recent monitoring corroborates the use of 28°C WBT threshold, no data is presented to prove this. Reports from Independent Observers and data included in the LiveCorp Submission point to a different conclusion.

There is another significant shortcoming in the Panel's analysis. As has already been pointed out, the TRP's standard sheep is totally unrepresentative of animals currently exported. About one-third of the

current trade are lambs, while the remaining two-thirds are sheep of considerably lighter weights than the TRP's 56kg animal.

Indeed, some recent shipments to Gulf destinations have involved almost 50% lambs, partly as a result of customer demand and partly due to the changing age profile of the Australian flock. Lambs also make up most shipments to Israel and Turkey (due to customer demand).

The Panel, realising that a range of animals are shipped to and through the Middle East, proposed that the 28°C WBT threshold be adjusted using factors in the HSRA model to adjust mortality limits across animal characteristics.

No evidence has been supplied in the draft report that the adjustment factors are correct – yet the TRP's recommendations rely just as crucially on these factors as on the veracity of the 28°C WBT threshold for the standard sheep. This points to yet another flaw in the TRP's processes.

An Effective Moratorium

ALEC Members have voluntarily undertaken a moratorium on live sheep shipments to the Middle East during the northern summer months of June, July and August.

Analysis by LiveCorp using VOS data, plus an allowance for heat generated by the animals themselves, suggests that it is very improbable, except in June, July and August, to encounter two days in a row with wet bulb temperatures constantly in excess of 30°C.

A wet bulb temperature of 30°C if prolonged for more than 48 hours has been suggested by Professor Maloney as when open mouth panting may occur (although he admits this is based on thin evidence). In June the probability of encountering WBTs in excess of 30°C for 48 hours is 4.7%, in July it is 7.7% and in August it is 12.1%. In other months it is close to zero.

The Risk of Contagion to Cattle

Whilst, the draft HSRA Review report confines itself in scope to the live sheep trade, it potentially sets a concerning precedent for the calculation of Heat Stress Risk Assessments in other species and in other areas of animal production.

Of concern to ALEC are the Australian Standards for the Export of Livestock Review Draft Recommendations 23 and 24. Taken together these recommendations propose to apply the findings of the HSRA review more widely to other livestock and other destinations involving livestock crossing the equator.

Should a heat stress risk assessment as proposed by the draft HSRA review be applied to cattle, then the viability of the live cattle will also be at risk.

Conclusion

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In summary, ALEC's proposal must be considered in the context of the following points:

- Implementing the 28-degree Wet bulb threshold, as recommended by the TRP, will result in the enforced cessation of the trade year-round. The TRP concluded this threshold, on the basis it would induce second phase panting, from outcomes of one, possibly two (the report is unclear) studies involving a handful of animals.
- Based largely on one small academic study the Panel has set a single arbitrary measure (wet bulb temperature) to regulate the trade. The use of a single measure may represent convenient regulation but ignores the complexity of animal welfare outcomes.
- There are studies that dispute the findings of the TRP as well as observations from the Australian Government's own Independent Observers that do not support the conclusion that open-mouth panting occurs at 28-degree WBT.
- A potential solution must build on measures adopted following both the McCarthy and Moss Reviews and shift focus to the actual welfare of the animal welfare rather than extraneous factors that may theoretically lead to certain conditions occurring during a shipment.
- Industry has already implemented a voluntary moratorium on shipments during June, July and August and remains committed to this. The period covered by the voluntary moratorium is also consistent with analysis by LiveCorp which identifies these as the periods of highest risk.

It is clear a measured, staged regulatory response is required which acknowledges the complexities of the issue that is attempting to be regulated ie. Heat stress. Regulatory measures must quite rightly seek to avoid instances of poor animal welfare, but as matter of principle the measure must be undertaken on existing scientific knowledge rather than speculative predictions of environmental conditions on a vessel.

It is also critical that any interim regulatory measures, as a matter of principle, do not prematurely adopt specific measures relating to an area of animal welfare science that is clearly still evolving.

Industry must be front and centre of any solution that is put forward. It is critical that the TRP engage meaningfully with industry members and LiveCorp, which leads industry's research is the foremost scientific authority for industry.

Should you wish to discuss this submission further, please do not hesitate to contact ALEC CEO, Mr Mark Harvey-Sutton on 0400 980 452 or at ceo@livexcouncil.com.au.

Attachment A - ALEC's response to the Recommendations

Recommendation 1

ALEC accepts Recommendation 1 of the draft report, provided a workable set of mechanisms can be uncovered to incorporate a welfare objective into the HSRA model while addressing the complexities of duration and respite and achieving alignment with real world observations.

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The LiveCorp submission contains some suggestions in this regard but will take time to properly research and implement. ALEC believes alternative, innovative and, in many ways, superior approaches could be implemented such as regulating welfare outcomes directly.

Recommendations 2 and 3
ALEC is strongly opposed to Recommendations 2 and 3 of the draft report for reasons set out in this submission and, in more detail, in the LiveCorp submission.

Recommendation 4
ALEC accepts Recommendation 4 of the draft report, with the provisos listed in comments regarding Recommendation 1.

Recommendation 5
ALEC accepts Recommendation 5 of the draft report and, dependent on the outcomes from the review process, would plan to request that LiveCorp research and implement several changes to HSRA.

ALEC, however, believes that HSRA should not be referenced in legislation, but that several alternative pathways be allowed for an exporter to demonstrate due diligence in avoiding heat stress and achieving satisfactory welfare outcomes for a voyage.

Under guidance from the regulator these pathways could include use of a re-designed HSRA model or simpler schemes such as use of threshold temperatures and various durations based on expert advice. This approach would be more aligned with best practice regulation, including other regulatory systems operated by the Department such as ESCAS.

Recommendation 6
ALEC accepts Recommendation 6 of the draft report. ALEC believes that the welfare of sheep throughout the supply chain is important.

Over many years ALEC has supported the in-market work of LiveCorp and MLA and has strongly supported the Export Supply Chain Assurance System (ESCAS). This work has included research into many aspects of animal welfare in market, including the impact of environmental heat. Earlier this year ALEC reacted to some of this work by placing a moratorium on placement of sheep into Qatar during the hotter months. Depending on whether a trade exists after the work of the TRP, ALEC will continue to support in-market activities.

Recommendation 7
ALEC accepts Recommendation 7 of the draft report. As highlighted earlier in this submission, ALEC has strongly supported the development of animal welfare indicators. Additionally, much of the thrust of this submission is predicated on the inescapable conclusion that current knowledge of the impact of environmental heat on animal welfare is extremely poor and greater data analysis is needed – it is critical that this data analysis be undertaken before rushing headlong into new regulation.

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At the same time, it needs to be observed that under existing regulations a range of data is collected on every live export voyage departing Australia. Data items collected under regulation include panting scores and wet bulb temperatures.

The department also has information on exact characteristics of livestock loaded on each deck. Given this, the collection of additional data seems to be less important than having data currently collected available in an accessible form.

From the draft report, ALEC has gained the impression that even the TRP did not have access to data collected in the past under regulation – certainly this data would have been most useful in assisting the TRP's deliberations and in meeting its Terms of Reference. Distressingly, data that is currently collected at the requirement of the regulator seems largely to be data collection for data collection's sake and use in the odd investigation. This needs to be recognised and corrected.

Recommendation 8

ALEC accepts Recommendation 8 of the draft report. Indeed, "other factors" contributing to animal welfare outcomes from environmental heat have been emphasized throughout this submission. It is since a holistic approach needs to be taken of environmental heat on animal welfare that ALEC has advocated alternative approaches to those of the Panel. ALEC has also emphasised the importance of ammonia and a range of other factors in its submission to the ASEL Advisory Committee.

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