ALEC Response to Draft ASEL Recommendations

Comments on Draft Report by the Technical Advisory Committee on Review of Australian Standards for the Export of Livestock

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1 INTRODUCTION AND GENERAL COMMENTS

1.1 INTRODUCTION

The Australian Livestock Exporters' Council (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 welcomes this opportunity to comment on the TAC's draft ASEL recommendations.

The opportunity is vitally important because, although supportive of many of the TAC's recommendations, ALEC believes that a number of the TAC's more important recommendations require revision. A number of the TAC's key recommendations will impose significant financial penalties on the trade and producers yet, in the view of ALEC, lack the necessary scientific support to justify such imposts.

Producers in remote areas of northern Australia (north Western Australia, the Northern Territory and north Queensland) will be particularly affected by the TAC's recommendations – as the TAC's own analysis recognises. To impose severe financial penalties on these producers requires the TAC to be certain that any changes recommended are warranted. In turn, this requires solid evidence that animal welfare is currently below what is required and that the changes will result in the improvements needed – across all situations in which the changes will apply. As ALEC will demonstrate in this submission, for many important recommendations made by the TAC this evidence does not exist. Without this evidence ALEC opposes radical changes to the current ASEL regulations.

Before commenting on the TAC's individual recommendations, it is important to make a number of general comments on the approach used by the TAC and common themes amongst the recommendations. These general comments are equally as important as ALEC's comments on individual recommendations as they highlight shortcomings in the approach being applied.

1.2 FAILURE TO MEET TERMS OF REFERENCE – RECOMMENDATIONS ARE NOT OUTCOMES BASED

The first of these general comments is that part of the TAC's Terms of Reference (ToR) was to: "*facilitate contemporary outcomes based regulation which will allow flexibility in achieving the required animal health and welfare outcomes, encourage innovation in industry practices and adoption of relevant technological improvements*". The TAC has failed to address this requirement in its ToR. The TAC notes that:

> *"In the reduced time available for the review, it has not been possible to explore alternative regulatory models in detail. The committee's view is that options for moving towards a more outcomes-based regulatory approach should remain a goal for future stages".*

ALEC submits that "time pressures" represent an insufficient reason for the TAC not to meet a major requirement of its ToR. ALEC also notes that in many areas it may have been simpler and quicker to specify outcomes based regulations than to specify input requirements – so that time pressures become irrelevant.

By focussing almost exclusively on inputs and procedures, the current ASEL regulations and those recommended by the TAC not only allow, but encourage, the trade to be mechanistic in its approach to meeting the almost endless list of specified requirements when better outcomes might be achieved through a combination of other methods (that the regulations do not envisage). The ASEL regulations provide little incentive to do better and stifle innovation.

It would be difficult to uncover a set of regulations with more "red tape" than the current ASEL regulations. The TAC's recommendations in a number of important areas have simply added to the red tape, imposing yet further rigidities around how tasks should be approached and levels of inputs needed, rather than stating desired outcomes.

ALEC submits that, if an innovative approach to the review of ASEL had been undertaken, new ASEL regulations could have specified a succinct set of outcomes against which compliance is measured. At the very least, in an innovative review of ASEL, the regulations would embody a recognition that there is interaction between different treatments at stages in the supply chain leading to an overall welfare outcome (rather than supply chain stages being considered largely in isolation of one another as occurs now).

At a lower level of innovation particular ASEL requirements or recommendations could have been recast as outcomes. For example, Recommendation 14 is:

> "*That the standards continue to require pelletised feed to be fed in troughs at the registered premises, and that feeders/troughs be of a design that prevents spoilage of feed, particularly during inclement weather. For sheep and goats held at registered premises in southern parts of Australia the standards should require they be fed from fully sheltered troughs, regardless of the time of year"*.

The recommendation that troughs be "fully sheltered" apparently arises from concerns that feed may be otherwise spoiled. But fully sheltering troughs represents only one way to ensure that feed is not spoiled. Why is not the outcome (i.e. uncontaminated feed) specified in the regulation rather than one way (sheltered troughs) to achieve the outcome. For example, the regulation could have been recast to read:

> "*Sheep must have access to feed that is neither contaminated nor spoiled*".

As noted, minor outcome oriented changes like this fall considerably short of the substantial changes that ALEC envisaged – but the recommendations by the TAC for changes to ASEL have not made the regulations more outcomes focussed even in minor ways.

The recent announcement of the Minister for Agriculture and Water Resources, David Littleproud, requiring an Independent Observer to accompany every voyage carrying sheep or cattle provides obvious scope to reshape ASEL into a more outcomes based document. Even if these observers, at some future time, cease accompanying all voyages, but only a sample of voyages as determined by risk analysis (as ALEC would advocate), this opportunity still exists.

To recast ASEL into outcomes based regulation represented a rare opportunity that has, apparently, been foregone. In ALEC's view it is unfortunate that the Review has not met important aspects of its Terms of Reference. One is reminded of the words of the American author H. Jackson Brown: "*Nothing is more expensive than a missed opportunity*".

1.3 Insufficent / No evidence exists for major regulatory changes being proposed

In many areas where major changes are being recommended by the TAC it is openly conceded that the *scientific evidence* is poor, but nevertheless the TAC recommends major changes. Equally, in these areas there is no *practical evidence* of systematically poor animal welfare outcomes from current stocking rates. This is certainly the case for cattle trades, particularly those to our Asian neighbours, which will be hugely affected by the changes proposed by the TAC. If the changes proposed are not being based on solid scientific evidence or clear practical evidence, they should not be recommended or supported.

ALEC recognises that in terms of animal welfare indicators the TAC is working in an impoverished information environment – and ALEC is working with its service provider, LiveCorp, to rectify this situation. It would be wrong, however, to assume that no information is equivalent to poor outcomes being recorded if the information did exist. An implicit assumption behind a number of recommendations seems to be that current welfare outcomes are poor – if this was not being assumed, why change the regulations? Rather than make this assumption, a more structured, measured approach would be to start collecting the animal welfare indicator data (or analysing the plentiful animal welfare and environmental data that has already been collected) and then change the regulations if needed as a result of data collected.

1.4 Heavily reliant on McCarthy Review and insufficient independent analysis

The TAC's draft report and recommendations are heavily reliant on the "short, sharp" review conducted by Dr Michael McCarthy between 10 April and 11 May. There are over 40 references to this review in the TAC's draft report and the review is directly associated with a number of the TAC's recommendations.

The McCarthy Review was completed under extreme time pressure and, possibly because of this, contains inadequate coverage of the science in a number of areas. It was written to only apply to the northern summer of 2018. The McCarthy Report is quite explicit in terms of the temporal nature of its recommendations. Page 3 of the Report contains the following paragraph:

> *"The review's recommendations fall into two categories. There are those recommendations that should be implemented as soon as practical if the trade continues during the higher risk 2018 northern hemisphere summer. These recommendations address the immediate and specific challenges of exporting sheep from Australia to the Middle East during that period. These are interim measures to apply until October 2018. The review recognises that some other recommendations may require more time to implement* ***and these will be considered by the ASEL review committee within their own time frame"****.*

In other words, on our reading, Dr Michael McCarthy expected that the ASEL Review would come to an independent view of any recommendation extending beyond those needed for the 2018 northern summer – using the *relatively* more relaxed timeframe within which the ASEL Review is occurring. Irrespective of whether this represents Dr McCarthy's views, the extreme time pressure within which the Review took place and inadequate coverage of the science means it should not be automatically used as a template for the future.

1.5 Insufficient segmentation of the live export industry in terms of recommendations made

In a number of areas, the thought processes that have gone into the TAC's recommendations seem to have been heavily focussed on long haul, yet are made to apply to all trades and often have

greatest impact on short haul. This focus is most apparent in the recommendations on stocking rates – but also seems to apply to a number of other recommendations.

An example is the recommendation on establishing a notifiable average daily mortality rate (ADMR) for live export voyages[1]. The TAC has recommended that this value be set at 0.025% for all voyages. On a three day voyage to Indonesia a mortality rate of 0.08% for the voyage as a whole (well below the TAC's recommended 0.5% for the voyage as a whole) equates to an ADMR of 0.025%. On a G-class vessel carrying fractionally under 4,000 cattle, mortalities of just 3 animals would trigger a notifiable incident (based on the ADMR recommendation). Two comments can be made about this:

- Great thought has to be given to any new regulation so that unintended consequences are avoided. Depending on the timing of the mortalities, and the likelihood of more occurring, the TAC's recommendation on ADMR may encourage a vessel operator to slow down the voyage to avoid a notifiable incident against the best interest of animal welfare.
- Second, before coming to a conclusion about the level of notifiable mortalities for live exports ALEC suggests that the TAC compare similar requirements that exist within the domestic industry to notify Governments or QA owners (in semi regulated schemes) of mortalities. In making this suggestion ALEC is fully cognisant that the TAC is prevented (understandably) from "*commenting on the suitability of domestic animal welfare standards for livestock*". This does, not, however prevent the TAC from referring to domestic standards and using them as a basis for standards to apply to the live export industry. To the contrary, in the interests of regulatory consistency, the process *should* be undertaken. ALEC knows of no domestic standards even remotely equivalent to the standards being applied to live exports[2].

The fact that many of the TAC's recommendations are made to bluntly apply to all trades, irrespective of voyage length, is of concern to ALEC given that it is not apparent that these recommendations are equally applicable across trades.

In proposing a new regulatory requirement, it is insufficient for the TAC to provide a justification across live exports generally. Rather separate justifications must be provided for each major segment for which the regulation is to apply, particularly if the economic implications are significant. To ignore this requirement would be to introduce new regulation recklessly.

1.6 THE TAC'S RECOMMENDATIONS INVOLVE VASTLY INCREASED REGULATORY BURDEN ON THE SHORT / MEDIUM HAUL CATTLE TRADE, A TRADE THAT HAS EXHIBITED FEW PROBLEMS

In a related point to that made above, ironically the TAC's recommendations fall most heavily on the short haul to medium haul feeder cattle trade (see recommendations related to stocking densities, minimum time in registered premises and bedding provisions), yet this trade has had a history of excellent performance. Feeder cattle are affected more than slaughter cattle by the TAC's stocking rate recommendations, for instance, since the increase in space allocations is proportionately greatest for light cattle. A number of longer haul trades with good performance will also be greatly affected (e.g. the *Bos taurus* breeder heifer trade to China).

[1] As noted in our previous submission, ALEC objects to use of this term "notifiable mortality rates", since all mortalities, including daily mortalities, are notifiable in that they are all provided to the Department. ALEC requests that the TAC recommend a change in language in the new ASEL regulations – the term is misleading.

[2] It is also worth noting that if standards applied to Australia's international trade are inconsistent with those applied domestically Australia could be in danger of breaching WTO obligations.

The TAC's own analysis (which in ALEC's view is confusing and an underestimate of the impact) shows that producer prices would drop by 12c/kg lw for light export steers from Darwin to Indonesia (using the 2017 average price) and by 30-40c/kg lw for export steers from Townsville to Vietnam. This represents regulatory change of gargantuan proportions[3].

Since mid 2004 almost 8.3 million cattle have been exported to south east Asian countries with a little over 6,500 deaths over this entire period – less than 0.08%. ALEC recognises that mortalities represent only one measure of animal welfare, but it is the sole available measure that has been consistently collected over time and stored in an accessible form.

1.7 Adequate notification required

As a final initial comment, ALEC wishes to make a point on adequate notification of regulatory changes. As recognised in the TAC's own report, the TAC's recommendations, if adopted, will affect the viability of some live export trades and businesses. ALEC takes this opportunity to inform the TAC that some exporters forward contract by 6 months (particularly in specialised trades). Any changes in ASEL that have significant financial implications should be delayed for six months from the date that a firm decision is made to implement so that existing contracts can be completed based on the regulatory requirements and cost base that was in place when the contracts were negotiated.

1.8 An outline for the remainder of this submission and a suggested way forward

In the remainder of this submission comments are provided against a number of the TAC's recommendations. In some cases these comments pertain to only part of one of the TAC's recommendations.

ALEC has fully accepted about 60 per cent of the TAC's recommendations without comment.

Of great concern to ALEC, however, is that a number of key TAC recommendations will substantially adversely affect live exports as a whole, creating additional imposts, including on voyages with a strong history of good performance. Moreover, ALEC will argue in this submission that, for these recommendations, there is an absence of evidence to justify large regulatory changes that will impose considerable hardship on producers and live exporters.

ALEC appreciates the situation faced by the TAC – having to make recommendations when there is a "*paucity of evidence*". ALEC recognises that the "*paucity of evidence"* does not reflect on the TAC – it simply reflects the fact that relevant data has not been collected or the studies conducted.

Among the TAC's more important recommendations is to collect additional live export animal welfare data (and to store this data is an accessible form so data analysis can readily be conducted – for there has been an abundance of past data collected that is inaccessible). Also, as previously noted, another important recent change has been for Independent Observers to accompany all live export voyages.

Collection of additional data, better storage of data collected and the reports of Independent Observers will form a solid foundation of evidence on which to base future decisions. This data,

[3] Despite showing huge price and economic impacts, the analysis contained in the TAC's report does not take into account changes to the HSRA model – these changes (unknown at this stage) may see prices drop considerably further.

including reports from Independent Observers, should allow any significant welfare issues flowing the current regulations to be quickly identified.

With new data, including reports from Independent Observers, being available in the near future, ALEC urges the TAC not, in the meantime, to introduce new regulations that have the potential to cripple the trade and for which there is a "*paucity of evidence".* Rather, a responsible, reasonable and defensible regulatory approach would be to:

- Adjust the current ASEL regulations where *compelling* scientific or practical evidence currently exists that this is warranted on animal welfare grounds (having regard to the type of voyage and livestock carried).
- Put in place a regular review process so that additional adjustments can be made as further evidence is collected.

Conversely, in the view of ALEC it would be irresponsible to introduce new regulations on issues where there is a "*paucity of evidence*", but where new data will shortly become available.

ALEC would strongly support regular reviews of the ASEL regulations being conducted. This is particularly the case over the next few months / years, as during this time substantial new, independently collected, information will become available for analysis.

The order of this submission does not follow that of the TAC's recommendations. Rather the order of this submission is based on draft TAC recommendations that ALEC views as most important to revise to avoid unnecessary pain and hardship being imposed upon live exporters, our producing suppliers and our customers overseas, with no proof of animal welfare benefits.

2 ONBOARD STOCKING DENSITIES

SUMMARY

- If substantial new costs are to be imposed on the industry through regulatory change there must be clear scientific or practical evidence that current welfare conditions are unsatisfactory and the new regulations will result in the improvements required. This must be shown for all voyage types to which the new regulations are to apply. This evidence is lacking in the TAC's draft report.
- The science of allometry as applied to animal welfare involving a group of animals is undeveloped, almost non-existent. Major question marks exist over both the k and power values used in the allometric equation. No research has been uncovered by ALEC into the best power value to use in the allometric equation when applied to animal welfare – but this is a vital area for the Committee's considerations. Certainly, tables used by practitioners, embodying experience and knowledge accumulated over time, are quite different to those defined by the allometric equation. ALEC submits that neither the theoretical nor practical evidence exists to justify a major change to regulations.
- Use of a k-value of 0.030 is aspirational, higher than applied in any other country in the world across typical cattle and sheep weights shipped from Australia, and should not be embedded in regulation. Neither should a k-value of 0.033 be used in the northern summer as this confuses the objectives of allometry with those of heat stress. Rather, allometry (or some other process) should be used to define space allocations that meet basic physiological and behavioural needs and additional space allocations to address heat stress risk should be determined through an appropriately calibrated heat stress risk assessment model.
- Substantially decreasing stocking rates cannot be justified for any voyage, but particularly so for short haul voyages and for exporters and voyages that have demonstrated consistently high levels of welfare performance.

2.1 INTRODUCTION

Undoubtedly, of greatest concern to ALEC are the recommendations regarding onboard stocking densities.

The TAC recommendations for onboard stocking densities are:

> *"That the standard adopt an allometric approach for calculating on–board stocking densities for sheep, with a k–value of 0.030 to be applied to the voyages during November to April, and a k–value of 0.033 for voyages during May to October".*
>
> *"That the standard adopt an allometric approach for calculating on–board stocking densities for cattle, with a k–value of 0.030. Where this approach determines a space allowance that is lower than the current ASEL requirement for a given liveweight and voyage, the higher space allowance will apply".*

ALEC is concerned that there is insufficient, indeed almost no, scientific basis to support such major regulatory change. The TAC's stocking density recommendations would impose significant additional imposts on both live exporters and producers, substantially reducing sheep and cattle prices, especially in Western Australia and northern Australia. Any regulatory change that imposes this degree of additional regulatory burden needs to be fully justified, being supported with clear evidence. The TAC has failed to do this. To the contrary, a conclusion that can be drawn from the TAC own statements is that there is a paucity of evidence to justify any change in stocking densities.

For the TAC to have made the recommendations it did to onboard stocking rates it should have addressed the steps below and come to the following conclusions[4].

- That there is solid theoretical and practical evidence to support the use of the same allometric equation to determine on-board stocking rates for all sheep and cattle at all weights (except for the very heaviest cattle and sheep and cattle in vulnerable and special classes).
- That a k-value of 0.030 has strong scientific support for determining live export stocking densities and more scientific support than any other value.
- That the above applies for all live export voyage types over which a k-value of 0.030 is to be applied.
- That it is more appropriate in terms of establishing required, reasonable and responsive regulation:
  - To use a k-value of 0.033 for the northern hemisphere summer sheep shipments and then apply a separate heat risk assessment, than
  - To use a k-value of 0.030 and then to adjust stocking rates further based on a separate heat risk assessment.

Substantial doubts will be now cast against each of the above conclusions.

2.2 IS THE APPLICATION OF ALLOMETRY TO DETERMINE STOCKING RATES SUPPORTED IN PRACTICE?

Academic proponents of allometry assert that the one simple equation, $A = k*W^{0.66}$, can be applied to accurately determine space allocations for anything from chickens to buffalos – where A is the space allocation, W is the weight of the animal and k is a constant. In fact, one such proponent of allometry, M.R. Baxter, has suggested that the allometric equation with a k-value of 0.027 could provide a reasonable estimate of the space occupied by ***any animal*** when lying, with the exception of animals with very different geometry, such as snakes.[5]

Although the concept of allometry is old (dating back before the 1936 article by Huxley and Teissier[6] when the term allometry first entered widespread use), it is now being applied far more broadly than original authors had envisaged. The original concept involved study of rates of growth of various body parts within a species. Now, not only is the same equation said by some to apply across species (which other researchers dispute), but also the concept is being applied well beyond its original use in surface area calculations to behaviours and whether the welfare needs of an animal are being met.

The use to which allometry is being put by the TAC is to allocate a space allocation for a group of animals of different body weights in a group situation. This requires a very accurate view of how space allocations should vary as body weight changes and how space allocations should be further adjusted because a group of animals is involved (with time sharing possibilities for the space allocated).

From ALEC's review of the literature no studies were found specifically examining how well the allometric space allocations fit across a range of body weights in a live export situation and whether

[4] If the TAC did go through the process set out below, it would be useful in the final report to set out the evidence that the TAC has relied on in each of the four major areas where conclusions had to be made – taking into account the totality of research and practical evidence in each area.

[5] See for example Baxter, M.R., 1992, "The space requirements of housed livestock" in C. Phillips and D. Piggins (eds.), *Farm Animals and their Environment,* CAB International, Wallingford, pp 67-81.

[6] Huxley, J. S., and Teissier. G., i936, "Terminology of relative growth, *Nature, Vol.* 137, pp780-781.

a systematic pattern exists of differences across body weights between space actually occupied by an animal and the space calculated from the allometric equation. Furthermore, there is almost a complete absence of studies on how animals time share space (and how this differs across species).

The TAC itself obviously had doubts about the use of the allometric equation across the complete range of weights found in cattle – as the TAC felt compelled to adjust the allometric results across certain weights (and use the existing ASEL specified space allocations instead – see Recommendation 21).

It is also notable that for the many guidelines and regulations that exist across the world, assigning a minimum amount of space for animals, none, to the knowledge of ALEC, precisely follow the space allocations determined by allometry.

All guidelines and regulations examined by ALEC departed from allometry in consistent ways - allocating less space to light animals, than the space allocation specified from the allometric equation, and more space to heavy animals. The obvious question is: are all these guidelines and regulations in error or is the concept of allometry too rudimentary and undeveloped to be applied in practice to address the welfare needs of a group of animals?

In actual regulations or guidelines departures from the space allocations determined by the allometric equation can be quite stark. We will provide just a few examples from the many uncovered by ALEC in a worldwide review.

The first example to be highlighted involves the Australian standards for land transport (road, rail) of animals[7]. Petherick and Philips note for this type of transport:

> "*For short duration transportation during which animals remain standing, a space allowance per animal described by the allometric equation: area (m^2) = .020$W^{0.66}$, where W = liveweight (kg), would appear to be appropriate*".

They further observe:

> *"we predict that, for journeys during which animals remain standing and do not feed or drink, welfare outcomes as demonstrated by indicators of stress, ... fatigue ... and numbers of injuries, would be poor for densities resulting in k-values of less than about 0.020".*

But the Australian land transport standards and guidelines for light cattle do use k-values substantially less that 0.020. Table 2.1 contains the allocations of space for cattle under these standards and guidelines at various weights. Also shown in this table is the implied k-value calculated from these space allocations using the allometric equation.

[7] Australian Government, Department of Agriculture, Fisheries and Forestry, 2012, *Australian Animal Welfare Standards and Guidelines: Land Transport of Livestock*, Edition One, Version 1.1, September.

Table 2.1: Minimum space allocations for cattle under Australian Land Transport Standards and Guidelines and corresponding k-values

Liveweight (kgs)	Space allocation (m^2)	Implied k-value
100	0.31	0.0148
150	0.42	0.0154
200	0.53	0.0161
250	0.77	0.0201
300	0.86	0.0199
350	0.98	0.0205
400	1.05	0.0201
450	1.13	0.0200
500	1.23	0.0204
550	1.34	0.0208
600	1.47	0.0216
650	1.63	0.0227

As can be seen from Table 2.1 implied k-values for the land transport standards for cattle range from 0.0148 (where, presumably, Petherick and Philips would predict very poor animal welfare outcomes) to 0.0227.

This pattern of providing less space for smaller animals and greater space for large animals, than would be determined through the use of the allometric equation, is repeated in other regulations and guidelines.

For example, the University of California at Davis, using the work of Temple Grandin, have provided recommendations for space allocated to cattle transported by road - see Table 2.2. Note from Table 2.2 k-values range from 0.17 (for light cattle) to 0.021 (for heavier cattle), not the constant 0.020 advocated by Petherick and Philips.

Table 2.2: Recommendations by the University of California, Davis, for space allocated to cattle exported by road (based on the work of Temple Grandin)[8]

Liveweight (kgs)	Allocated space (m^2)	Implied k-value
91	0.325	0.017
181	0.595	0.019
272	0.790	0.020
363	0.966	0.020
454	1.115	0.020
544	1.347	0.021

The same pattern of providing less space for smaller animals and greater space for large animals, than would be determined through the use of the allometric equation, is replicated in regulations or guidelines established in the US and EU for cattle transported by sea (see Tables 2.3 and 2.4). Again, substantially lower k-values are applied to light cattle, particularly by the US.

[8] The odd values for liveweights arise in this table because data has been converted from imperial measurements to metric. See https://www2.vetmed.ucdavis.edu/vetext/local_resources/pdfs/pdfs_animal_welfare/2011cattlestandards.pdf.

Table 2.3: Implied k-values for space allocations used in the US for cattle transported by sea

Liveweight (kgs)	Allocated space (m^2)	Implied k-value
100	0.430	0.021
200	0.770	0.023
300	1.110	0.026
400	1.450	0.028
500	1.790	0.030
600	2.130	0.031

Table 2.4: Implied k-values for space allocations used in the EU for cattle transported by sea

Liveweight (kgs)	Allocated space (m^2)	Implied k-value
200	0.810	0.025
300	1.0575	0.025
400	1.305	0.025
500	1.5525	0.026
600	1.800	0.026
700	2.025	0.027

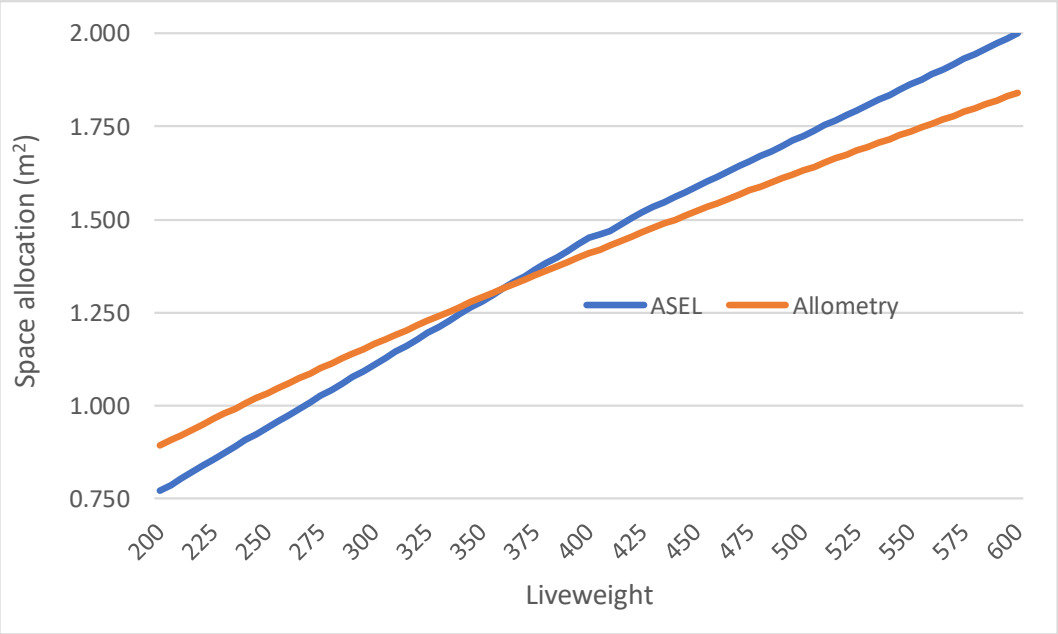
Practitioners, rather than academics, have had input into these tables. There is consistency in all these tables – proportionately lower space allocations for lighter weights than indicated by use of the allometric equation using a constant k-value and higher space allocations for greater weights. Is the TAC confident that these practitioners, working in different parts of the globe and independently, have all got it wrong? Or does the usefulness of the allometric equation, using a constant k-value (of whatever level), require significant additional refinement?

As previously noted, the TAC, also, has expressed doubts with the allometric equation by allocating additional space, than that indicated by the equation, for heavy cattle. If these doubts exist for the heavy cattle (as they evidentially do in the minds of the TAC), are there similar question marks around use of the allometric equation for lighter cattle (and, therefore, by implication, around use of the equation in general)?

The difference between space allocations established by practitioners and by the allometric equation is reflected by the degree of downward inflection of the space allocation line as animal weights increase (see Chart 2.1). Often allocations established both by practitioners and through use of the allometric equation inflect downwards as weights increase (as they do in Chart 2.1), but the space allocations established by the allometric equation inflect downwards more sharply.

Chart 2.1 shows the existing ASEL space allocations for cattle versus those determined through the allometric equation (in Chart 2.1 the k-value used is 0.027, but the point being made holds true whatever k-value is chosen). The ASEL space allocations inflect down, but nowhere near to the extent of the allometric allocations. Effectively both allocations use a form of allometry but the ASEL allocation uses a power value much closer to 1 than 0.66 (in fact some overseas tables do use a power value of 1 – i.e. space allocations increase by a constant amount as weights increase).

Chart 2.1: Current ASEL cattle space allocations compared to those from the allometric equation.



The end result of the different rates of inflection is that the allometric equation allocates proportionately more space to light cattle and proportionately less space to heavy cattle than do tables established by practitioners.

The question is: which rate of inflection is optimal from an animal welfare viewpoint? The Petherick and Philips review is silent on this issue, but it is one of the key issues to be faced when determining stocking densities (and, therefore, for this review). Note that the shape of the curve from an animal welfare viewpoint may be completely different from that when space occupied by animals only is being considered (i.e. the optimal power value and, hence, shape of the curve may be completely different when using allometry for the purposes of welfare outcomes than the traditional use of allometry in describing two dimensional space occupied as an animal grows)..

To expand on the previous point, using a power value of 0.66 may be appropriate to describe the space physically occupied by one animal, but that does not make it appropriate to meet the welfare needs of a group of animals. No study has varied the allometric power value to measure the impact on animal welfare over different body weights – only the k-value has been measured. Varying the power value may be just as important, if not more important, than varying the k-value. The fact that the power value has not been examined represents a major gap in the literature – surprisingly, proponents of applying allometrics to animal welfare seem to be ignorant of the fact that the power value is as important as the k-value.

Certainly, the power value lies at the heart of space allocation decisions to be made by the TAC. A power value of 1, used in a number of overseas tables may be entirely appropriate – we just do not know, since there is a research void in this area. Despite the research void in this area, ALEC would offer the following observations that may suggest that a power value of 0.66 is inappropriate:

- Light cattle are known to travel well. Evidence that they travel well can be found in the low mortality rates for the *Bos taurus* breeder heifer trade to China and the Indonesia feeder trade.
- Conversely, there have been some issues with heavy cattle.

This is by no means definitive evidence, but does question the sharp inflection (caused by a power value of 0.66) in the allometric equation (at least in that version of the equation normally used – because the allometric equation, in its general form, allows any power value to be used).

To summarise this section, it has been shown that space allocations developed by practitioners differ substantially and in a consistent way from the theoretical literature on allometric equations. If a simplistic use of the allometric equation is recommended by the TAC, the TAC needs to be fully cognisant that it is ignoring:

- the accumulated wisdom of practitioners in Australia, involved in developing the land transport standards and previous ASEL standards,
- the universal wisdom (from all the examples of regulations and guidelines examined by ALEC) of practitioners overseas working (apparently) largely independently.

In coming to a conclusion on the usefulness of allometry to the determination of stocking densities the TAC needs to address the following questions:

- Is the TAC convinced that allometry represents solid science on which to regulate stocking rates to address animal welfare needs – or is further refinement and knowledge required? If allometry is based on solid science why has it been ignored in so many practical circumstances? Why also have major areas in which knowledge is needed if allometry is to be accurately applied, such as the level assigned to the power value, received no attention at all? Does the TAC believe that practitioners both in Australia and overseas have been universally in error by allocating proportionately less space for lighter cattle than determined through use of the allometric equation and proportionately more space for heavier cattle? If so, what is the basis for the TAC believing that they are in error and how could they have got it consistently wrong?
- If the TAC is convinced that allometry represents solid science on which to determine stocking rates why depart from this science in some situations as the TAC has recommended (i.e. for heavy cattle)?
- If the science behind allometry is not solid enough to be universally applied (as the TAC has concluded in relation to heavy cattle) has the TAC considered all situations where a departure from allometry may be warranted? Evidence is required of this consideration.

2.3 Is there solid scientific or practical evidence to support a k-value of 0.030 across live exports generally and a value of 0.033 for sheep shipments during the northern hemishpere summer?

The previous section has highlighted concerns and questioned the use of allometry as a basis for determining stocking rates. There are even greater doubts over the selection of a k-value to be used in the allometric equation.

ALEC notes that in its latest report the TAC has correctly stated that a k-value of 0.033 "*is described in the literature as providing an acceptable space allowance for animals in* ***long–term—typically lifetime—confinement***" (our emphasis).

Despite this recognition, 0.033 is the k-value that the TAC is proposing for sheep shipments during May to October, with only a slightly lower value of 0.030 to apply to all other cattle and sheep shipments. ALEC believes that there is negligible scientific and practical evidence to support a k-value of 0.030.

2.3.1 Severe scientific uncertainty over the selection of k-value

The following statements, drawn from the Petherick and Phillips review, are evidence of the fragile foundation beneath a recommendation of k=0.030. In particular the following statements highlight:

- The lack of knowledge generally and complexity involved in accurately allocating space for livestock.
- The fact that a k-value of 0.027 allows all animals to lie simultaneously.

> *"Establishing the optimum space allowance is complex, because space potentially interacts with many aspects of an animal's environment, such as the design of the area in relation to animals being able to feed, drink or rest; the number of other animals present and whether they are unfamiliar or familiar with each other; the construction and materials used to enclose the space, in particular the flooring which influences friction …"*
>
> *"In this paper, we review the use of allometric principles and equations to estimate the static space requirements of animals …. We emphasise the word 'estimate' because the evidence is insufficient to make firm recommendations for all situations".*
>
> *"Where it is desirable for all animals to lie simultaneously, then a minimum space allowance per animal described by the allometric equation: area (m^2) = $0.027W^{0.66}$ appears to permit this".*
>
> *"We recognise that social interactions between group members can influence the amount of space that animals require and the way in which it is used. … In social species, such as cattle, sheep and pigs, the space between and around extended limbs can be shared by other lying animals, reducing the total amount of space required for lying … As with transportation, we know little about the extent of synchronicity of behaviours in cattle and sheep in intensive housing. … We also know little of time-sharing of space in intensive housing".*
>
> *The amount of space required by animals in longer-term transportation and intensive housing is likely to be dependent upon the duration of the confinement. As a minimum, the space allowance per head determined from the equation: Area (m^2) = $0.027W^{0.66}$ would appear to allow the simultaneous lying of animals, but there are insufficient data to determine whether this allowance would provide sufficient space for animals to adequately access feed and drink onboard a vehicle/vessel. For long term confinement, a minimum allowance per head determined from the equation: Area (m^2) = $0.033W^{0.66}$ appears to reduce risks to welfare and productivity. These suggestions require validation with different species and under different thermal and vehicle/vessel stability conditions.*

The TAC itself has recognised the lack of information regarding setting a k-value for livestock exports. In particular the TAC found that there was:

> *"a paucity of evidence regarding appropriate stocking densities for the unique environmental conditions that impact livestock on–board vessels".*

2.3.2 What does the practical evidence suggest in the selection of a k-value?

In light of the lack of firm scientific evidence to recommend any k-value, especially once interaction between livestock is recognised, surely greater emphasis should have been placed by the TAC on space allocations that have been based on practical experience.

Five sources of practical evidence exist.

Evidence from the experience embodied in the current ASEL tables

First, as the TAC recognises, presumably the current ASEL space allocation tables embody "*experience and risk mitigation over time".* For the base ASEL cattle table the k-values that apply to weights typically shipped to major destinations are mostly in the range 0.025 to 0.028. Similarly, for sheep, the k-values that apply to weights typically shipped are in the range 0.024 to 0.025[9]. The embodiment of experience (which, in the view of ALEC, is undoubtedly captured in the existing ASEL tables and those used elsewhere in the world – see below) should only be ignored if there is compelling new evidence.

Evidence from the experience embodied in the tables used by advanced overseas countries

Second, "*experience and risk mitigation over time"* is presumably embodied in the space allocation tables used by overseas countries. For typical weights (for livestock shipped from Australia) k-values from space allocations used for cattle by overseas countries are in the range 0.025 to 0.028. Similarly, for sheep, k-values are mostly in the range 0.024 – 0.026[10]. The practical experience embodied in overseas tables does not suggest a k-value of 0.030 should be used.

Evidence from current welfare outcomes, measured by mortalities

Third, the evidence is that the "*experience and risk mitigation over time"* embodied in the current ASEL standards has resulted in good welfare outcomes. To reverse this statement, there is little or no evidence that the existing stocking densities have resulted in poor welfare outcomes. ALEC recognises that mortality is not the only measure of animal welfare, but it is *a* measure and has been consistently collected over many years (and stored in an accessible form). Mortalities, particularly for cattle shipments, are low. The majority of cattle voyages since 2010 (more than two-thirds) have recorded mortalities of less than 0.1%. For short haul voyages almost 85% have recorded mortalities less than 0.1%. Again, there is no evidence here that current stocking densities are deleteriously affecting welfare.

It is to be noted that cattle typically are sold on the basis of weight at the discharge port. Exporters have a commercial interest in ensuring good animal welfare outcomes, including minimising mortalities and achieving weight gains.

Evidence from CSIRO study

Fourth, as pointed out in ALEC's original submission, the CSIRO completed a stocking density project in 2013 that assessed two long haul sheep voyages to MENA in June and December 2010 and one short haul cattle voyage of 320 kg steers to Indonesia in June 2012. This work was partly undertaken as a result of a view expressed by Petherick and Phillips that there was "*a paucity of scientific information on the impact of stocking density on livestock …. onboard ship(s)*". Given this and by inference, the lack of objective data to support the current ASEL space allowances, they

[9] In these comparisons we always use the base tables. As previously noted we firmly hold the view (apparently shared by most other submitters) that heat stress should be separately considered. Some of the current ASEL tables contain larger space allocations due to heat risk as these tables were designed prior to the HSRA model. For cattle weights representing typical shipments we have used 300 to 400 kgs. For sheep weights representing typical shipments we have used 40 to 50 kgs liveweight.

[10] Again, for cattle, we have used cattle weights of 300kgs to 400kgs liveweight as our reference point in making these statements since they are representative of the weights of cattle shipped live from Australia. For sheep we have used 40 to 50 kgs liveweight.

recommended research be conducted to evaluate a range of space allowances during sea transport.

The CSIRO report conducted on-board stocking density trials based on the following three space allocations:

- ASEL,
- ASEL less 10 per cent, and
- ASEL plus 10 per cent or space allocated allometrically using a k-value of 0.027 (whichever was greater).

The animal welfare variables examined by CSIRO were:

- Change in liveweight
- Change in lying behaviour or time spent lying
- Incidence of ill-health or disease

A key finding of the CSIRO report was that, based on the animal welfare indicators applied, the ASEL v2.3 stocking densities are appropriate, but a 10 per cent increase should be further *investigated* (note: not automatically implemented).

A brief summary of the CSIRO findings is:

- Stocking density treatment had no effect on either final liveweight or liveweight gain over the voyage for any of the voyages. For the cattle voyage the only group of animals to experience weight gain was in the highest stocking density group (involving a space allocation of ASEL less 10%), but this was insignificant and should be ignored, as should other non-significant results.
- Stocking density treatment had no significant effect on lying behaviour during the voyage, except for highest stocking density (ASEL less 10%) used on one of the sheep voyages – and then it was only on some days.
- Incidences of ill health and mortality were low on all voyages – with no significant relationships demonstrated with stocking densities.

The CSIRO results can be seen as a vindication of the TAC's view (and that held by ALEC) that the ASEL stocking densities embody "*experience and risk mitigation over time*" – and reasonably reflect what is required.

<u>Evidence from Australian Government Accredited Veterinarians (AAVs)</u>

Fifth, there is practical evidence provided by AAVs in a submission to the HSRA Technical Reference Panel. No AAV recommended a drastic change to stocking densities. The following statements from AAVs appear in that submission:

> *"I believe the k value more applicable to sheep and cattle feedlotted on a ship is more like 0.025. There does not appear to be any valid scientific basis for the use of this k value* [i.e. the k-value of 0.033 suggested in the Issues Paper]"*.*
>
> *"The approach that should be used if we are to move to using a k values is start at the k value that is representative of the current HSRA/ASEL values. This will allow k values to be quantified to previous voyage history. New values can then be tested on voyages and comparisons made to previous voyages outcomes. i.e. – start where we are currently and test – rather than bring in some guesstimate value. The McCarthy report states in relation to a k value of 0.033, that 'The*

review found no science to refute this allocation of space.' Yet he offered no science to support it".

"I question the k value of 0.033 having done a voyage on a ship in June 2018 with sheep loaded at that density. Total load 9450 sheep, 3500 cattle. All of the sheep were able to lie down in the pens and had so much room that they were fighting at the back of the pens. For the summer heat period it should be about 0.025, and lower for cooler periods".

Summary

A question that the TAC must answer is: if there is a "*paucity of evidence regarding appropriate stocking densities for the unique environmental conditions that impact livestock on–board vessels*" in recommending a k-value of 0.030 why has the TAC ignored the above practical evidence?

ALEC submits that based on the foregoing a k-value of 0.030 is neither supported by science nor practical evidence.

2.4 A K-VALUE OF 0.030 IS ASPIRATIONAL AND SHOULD NOT BE REGULATED

Regulated stocking densities during transport should allow animals to perform basic behavioural functions – lie down, feed and allow access to water. Some community members may wish to apply greater space allocations than those needed to perform basic behavioural functions – but these reflect individual value judgements and should have no place in regulation.

Very substantial variations will exist between community members on all aspects of animal welfare, but regulation should deal with minimum community standards. Hugh Millar has recently addressed this situation in a very thoughtful piece for the egg industry[11]. Among the several observations offered by Hugh Millar are the following:

"… animal welfare is necessarily both science-based and values-based. In that sense animal welfare is like some other difficult public policy areas charged by often vocal individual and collective opinions – such as environmental sustainability – where the tools of science are used within a framework of values.

In other words, animal welfare, though quite amenable to scientific study, is also founded in values based ideas about what people believe to be more or less desirable. There is no 'absolute truth'.

….Indeed the frameworks can be seen as representing a spectrum, from a strongly science/evidence-based approach (biological functioning) to a currently more values-based approach (affective states), in which ethical judgements (moral values) will be increasingly brought into play."

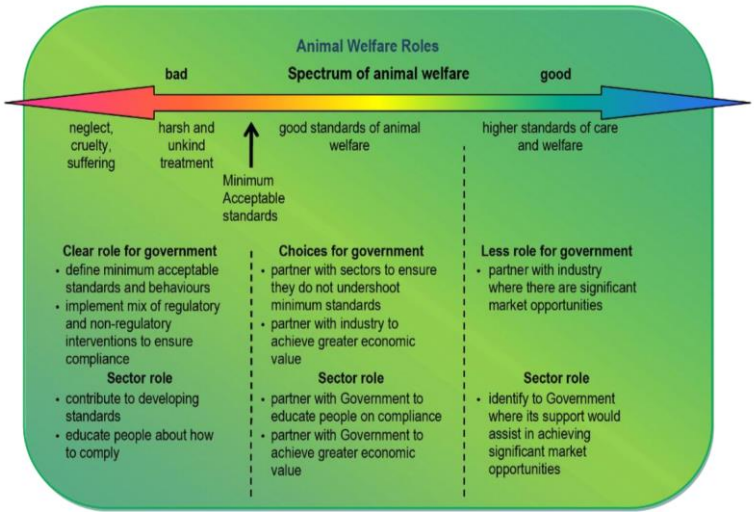
Hugh Millar also noted the challenge that this "values and science based" framework presents for regulation as follows:

"As a rule, regulation requires an evidence base and deals with a 'minimum community standard', explaining in part why legislation, for example mandatory animal welfare standards, often (and necessarily) falls short of meeting collective community (values-based expectations)".

[11] Millar, H, 2018, A Review of Animal Welfare Policy and Assessment Frameworks, *Final Report Project 1HS802*, Australian Eggs Limited, Sydney, July. Hugh Millar was previously the Chief Veterinary Officer in Victoria (as well as a current member of the Technical Advisory Panel).

Further to the above Millar identified and supported the policy approach adopted by New Zealand and outlined in its Animal Welfare Strategy and shown in the figure below. This approach:

- recognises that there is an animal welfare spectrum, with cruelty/ suffering/neglect and harsh treatment being at one end, and high standards of care and welfare at the other end of the spectrum; and
- identifies that the greatest role for Government is in defining and regulating minimum acceptable standards of animal welfare with higher standards of welfare left to industry and commercial players.



Given the reasoning contained above, the focus of ASEL regulations must remain on appropriate evidence based minimum acceptable standards and good regulatory principles. A k-value of 0.030 does not meet these principles.

A strong basis on which to form regulations (minimum acceptable standards) is the OIE requirements for stocking densities. As pointed out in ALEC's original submission the OIE specifies the following animal welfare requirement when determining stocking densities during live export:

> *"The amount of space required, including headroom, depends on the species of animal and should allow the necessary thermoregulation. Each animal should be able to assume its natural position for transport (including during loading and unloading) without coming into contact with the roof or upper deck of the vessel. When animals lie down, there should be enough space for every animal to adopt a normal lying posture"*

Normal lying posture for sheep and cattle involves semi recumbency (certainly met with a k-value of 0.027, with a number of studies contending a k-value of 0.025 provides sufficient space) or sternal lying (a k-value of 0.019 - 0.020). The authors of the Australian standards for feedlotting sheep obviously consider that sternal lying (k-value of 0.020) meets the OIE requirements as standard S9.6 states: *"A person in charge must ensure sufficient space to allow all sheep to lie on their sternums at the same time in an intensive production system*". Based on the evidence above a k-value of 0.027 certainly meets the regulatory requirements for minimum acceptability – in fact the evidence provided indicates it exceeds these levels, perhaps considerably.

2.5 CONFUSION OF HEAT STRESS AND ALLOMETRY

As previously noted, the ASEL standards for stocking densities recommended by the TAC for sheep confuse an allometric space allocation with space allocations due to heat stress. A k-value of 0.030 has been recommended for sheep exports during November to April, but a k-value of 0.033 for

sheep voyages during the northern hemisphere summer (defined by the TAC, we believe erroneously, as May to October).

The incorporation of factors stemming from heat stress risk assessment considerations in an allometric value muddles what should be two separate processes – that is:

- Determining space allocations due to the physiological and behavioural needs of animals (using allometry with an appropriate k-value)
- Determining if additional space is required to that calculated above to reduce risk of heat stress (using an appropriately calibrated HSRA model)

Dealing with heat stress by setting a lower stocking density for all voyages and vessels at certain times of the year (say by using a higher k-value in the allometric equation) does not represent outcomes-based regulation. It penalises:

- Those with good vessel ventilation.
- Those who may choose to send livestock early or late in the six month period to which the higher k-value is to apply. Why a constant allometric factor of k=0.033 should apply for all of the six month period is unknown – clearly conditions (in terms of wet bulb temperatures) vary considerably over this time (they are very different in the months of May and October from what they are in August and September).

Applying a k-value of 0.033 for northern hemisphere summer voyages is unnecessary, not scientific and represents bad regulation.

2.6 A K-VALUE OF LESS THAN 0.030 SHOULD BE APPLIED TO ALL VOYAGES, BUT ESPECIALLY, TO SHORT HAUL VOYAGES AND TRADES AND EXPORTERS SHOWN TO BE CURRENTLY PERFORMING WELL

As has been amply demonstrated in ALEC's original submission and in the foregoing sections of this chapter, setting stocking densities allometrically using a k-value of 0.030 is not justified for any voyage, but it is particularly not justified for short haul voyages or for voyages and trades shown currently to be performing well.

Petherick and Phillips propose a k-value of 0.027 is appropriate where "*it is desirable for all animals to lie simultaneously*" – this is the situation for a sea voyage lasting a number of days or a couple of weeks. In proposing this 0.027 value Petherick and Philips observe "*there are insufficient data to determine whether this allowance onboard a vehicle/vessel would enable animals to move and access food and water with ease*". Note that Petherick and Philips did not point to evidence indicating animals were **not** able to *move and access food and water with ease*. Although **scientific** evidence may be lacking (since enough studies have not been conducted), we submit that there is **practical** evidence that animals ARE able to access *food and water with ease.* On a number of voyages animals gain weight – indicating ease of access to feed (the CSIRO study, previously referenced, demonstrated this). This weight gain is so common that the Department recently entrenched an allowance for weight gain in regulation[12]. We, therefore, submit that a k-value of 0.027 allows animals to lie down simultaneously and, with time sharing taken into account, allows animals to *move and access food and water with ease*.

[12] ALEC notes that the TAC has advised (but not recommended) against inclusion of an allowance for weight gain. ALEC concurs with the TAC's advice. Introducing an allowance for weight gains suggests that appropriate stocking rates can be determined with a great degree of precision – this is not the case.

The duration of voyages to Indonesia can be as little as three days. Three days is not much more than the 48 hours that cattle (or sheep) are able to be trucked or railed using the Australian Land Transport Standards before being spelled. The Australian Land Transport Standards only provide sufficient space for animals to stand. On short voyages to Indonesia (and on other voyages) ALEC is proposing sufficient space for animals to lie down simultaneously. Again, this points to the adequacy of a k-value of 0.027, particularly for voyages lasting a number of days.

Voyages to near Asian neighbours typically experience very low mortalities. For example, of the almost 2,000 cattle voyages to Indonesia since mid 2004 only a handful (8) have recorded mortality levels of more than half of one percent. Almost 50% have recorded no mortalities at all. Similarly, across South East Asia generally since mid 2004 with over 2,500 voyages only 41 have recorded mortalities greater than 0.5%. Of the more than 8 million cattle shipped to Southeast Asia since mid 2004 less than 0.1 of 1% have died.

From an examination of voyage investigation reports for South East Asia since 2012 stocking density has not been an identified causal factor for the few mortalities that have occurred. Rather causal factors have included respiratory diseases (respiratory disease being attributed in a number of cases to spending too long in Registered Premises during winter and sometimes associated with a greater proportion of *Bos taurus* genetics), injuries (mostly attributed to rough weather during the voyage), ineffective non-slip flooring in a new livestock export ship (in one case) and "unidentified causes".

Even for some longer voyages, mortalities and welfare incidents can be quite low due to the nature of the trade. For instance, the trade to China has been dominated by shipments of young *Bos taurus* breeder heifers. These are animals that experience few problems. More than 675,000 cattle were shipped to China between mid 2004 and the end of 2017, yet only 817 deaths were recorded, an average mortality rate of 0.12%.

The obvious question is: in the absence of convincing scientific evidence (one might well say *any* scientific evidence) to support a dramatic reduction in stocking densities, why should densities change, particularly on trades that are performing well?

2.7 IMPACT OF THE TAC'S STOCKING DENSITY RECOMMENDATIONS

The impact of the TAC's space allocation changes can be demonstrated with the example of a G-class vessel with pen space of 4,000m^2 operating to Indonesia and carrying cattle of 320kgs.

Table 2.5 shows the space allocations under ASEL and allometry using a k-value of 0.030. It also shows the number of cattle loaded under both scenarios.

Table 2.5: Space allocations and total cattle loaded under ASEL and under the TAC's recommendations - example using a vessel with pen space of 4,000m^2 to Indonesia carrying cattle of 320Kg

Measure	ASEL	TAC's Recommendations
Space allocation	1.178	1.351
Number of cattle loaded	3,395	2,961
Difference in number of cattle loaded with ASEL	0	-434

With this example, under the TAC's recommendations 434 less cattle would be loaded on the vessel than under ASEL – these changes have tremendous commercial implications for exporters and producers, reducing capacity by about 13%, without any justified benefit, and undermining Australian competitiveness.

2.8 REVIEW SHOULD BE INDEPENDENT OF PAST REVIEWS AND EVIDENCE BASED

ALEC is concerned that in arriving at its recommendations the TAC has placed undue emphasis on the McCarthy Review recommendations and disproportionate conservatism has been applied. Conservatism *may* be appropriate in establishing best practice guidelines in *some* circumstances – but establishing best practice guidelines is very different from establishing new regulations.

The concern of ALEC stems from the following observations:

- First, a k-value of 0.030 is close to the space allocations recently regulated by Department for sheep shipments to the Middle East during November to April. The Department is currently applying a space allocation of ASEL+17.5% for these shipments. For a 45kg sheep this is equivalent to a k-value of 0.029.

- Second, for sheep shipments the k-value recommended by the TAC for May to October is 0.033, the same as recommended by McCarthy. This is despite the TAC noting that submissions to the ASEL Issues Paper: "*generally separated the discussion on base stocking densities from decisions on space required to avoid heat stress (to be determined via a heat stress risk assessment)*". As the ALEC submission noted, the heat stress risk assessment and allometric methods of determining stocking densities are directed at meeting two quite distinct objectives:
  - The heat risk assessment is aimed at setting stocking densities so that the risk of animals dying or unduly suffering from heat on a live export voyage is minimised.
  - The allometric determination of stocking densities is to ensure that sufficient space is provided to meet the basic behavioural and physiological needs of animals whilst being transported.

  The second objective applies to all voyages irrespective of whether there is a risk of heat stress. Because of this the allometric equation, with an appropriately set k-value, should be used to determine minimum space allocations - to meet the basic behavioural and physiological needs of animals. If heat stress is a proven risk for a particular voyage route, a heat stress risk assessment should be separately undertaken. The two methods of determining stocking densities should not be confused – but this is precisely what the TAC has done. This was justified by the TAC on the basis that it was a McCarthy recommendation and there had been "*little opportunity to assess the performance of consignments loaded to the McCarthy specifications*". We do not believe this represents a sufficient justification when there is widespread agreement not to confuse heat stress risk assessment with allometry.

- Third, use of a k-value of 0.030 conveniently results in space allocations that exceed the current space allocations except for very heavy cattle. If a lower k-value were used (such as 0.027 which ALEC believes is supported by scientific evidence), for heavier cattle the "scientific" allometric approach would result in space allocations being reduced.

- Fourth, even using a k-value of 0.030 (rather than the 0.027 advocated by ALEC as having most scientific support) very heavy cattle are allocated less space under allometry than under the current ASEL regulations. For these cattle the TAC has departed from the scientific allometric approach by adding a caveat. The caveat is that when the space allocation calculated under allometry is "*lower than the current ASEL requirement for a given liveweight and voyage, the higher space allowance will apply*". The TAC justified this by noting the architects of the ASEL space allocations had: *"provided **disproportionately extra space** for animals at **higher weights**, presumably based on experience and risk mitigation over time. The committee was concerned to ensure this continued to be reflected in the base space allowances required within the standards,*

as allometric calculations only provide for a constant linear increase of space allowance with increased in liveweight". The TAC could have equally noted that the architects of the ASEL had provided allocations involving **disproportionately less space** for animals of **lower weights**, presumably based on experience and risk mitigation over time – and just used the ASEL tables.

2.9 WHAT NEEDS TO BE DEMONSTRATED BY THE TAC

A major change such as will occur if the recommendations of the TAC are adopted demands strong scientific and / or practical support. ALEC believes this support is absent. However, if the TAC believes such support exists it needs to demonstrate the following:

- That allometry enjoys strong scientific support and the consistent pattern of departures from allometry to be found in space allocation tables all over the world (including in the Australian Land Transport Standards produced in 2012) are due to practitioners being wrong rather than the science needing refinement.
- Evidence that the current ASEL regulations are resulting in substandard animal welfare outcomes across all species, livestock weights (and other relevant characteristics) and voyage types to which the new regulations will apply.
- Substantial scientific / practical evidence to support a k-value of 0.030.
- Scientific / practical evidence to show that a value of 0.030 has more support than any other k-value.
- Evidence to support this value being applied across all species, livestock weights (and other relevant characteristics) and voyage types (short haul, long haul, extended long haul) to which it will be applied.

2.10 CONCLUSION

In writing its Stage 2 Issues Submission, ALEC was aware of some issues with the use of allometry for determining space allocations for live exports from Australia. This is why ALEC in that submission supported the use of allometry "*to **guide** the determination of "base" stocking densities for livestock exported by sea from Australia*". Even further issues with allometry have emerged in the preparation of the current submission.

Given the substantial doubts raised in this submission over the use of allometry ALEC would suggest two possible courses of action open to the TAC.

One would be to continue to use the current ASEL tables, adjusting these when there is strong scientific or practical evidence that a different space allocation should apply.

The other would be to continue with an allometric approach as a guide using a k-value of 0.027– that is, the k-value with most scientific and practical credence. Given the already expressed inclination of the TAC, ALEC would also support a recommendation that space allocations be based on allometry, using a k-value of 0.027, or current ASEL *whichever is the higher*.

As alluded to in the introductory chapter to this submission, *a not unreasonable approach would be to immediately adopt space allocations based on a k-value of 0.027, or current ASEL whichever is the higher, and then further adjust these space allocations for particular voyages / livestock types as more data comes to hand.*

Based on all the evidence before it, ALEC is strongly opposed to use of a k-value of more than 0.027 at this time, especially for short haul voyages and other voyages and exporters with a demonstrated history of good performance.

A k-value more than 0.027 will impose enormous costs on the industry. Even using a k-value of 0.027 will impose not insignificant costs. If regulations are to be changed to add millions of dollars of costs to the industry, significantly reducing prices paid to producers, proof is needed that change is warranted. Based on all the information available to ALEC, this proof does not exist – either there is no evidence at all or the evidence is weak and conditional.

ALEC urges the TAC to re-consider its stocking rate recommendations and avoid imposing unnecessary and unjustified hardship on producers, our international customers and live exporters.

3 HEAT STRESS

SUMMARY

- ALEC submits that the HSRA model objective should remain focussed on mortalities until a new measure has been identified, scientifically validated and tested. Moreover, any new objective for the HSRA model must meet the following characteristics: simple to collect and explain, robust, objective, reliable and repeatable.
- Although not conceptually opposed to a wider geographical application of the HSRA model, changes to the model will be complex and costly. A case needs to be developed that value will be added by incurring this expense. To develop this case research is first needed to identify and quantify the extent of heat stress risks on voyages other than to and through the Middle East. Decisions can then be made on wider application of the HSRA model.
- If the research above recommends wider application of the HSRA model, changes to the model will take time – perhaps a few years. Changes to the model may also be required as a result of the recommendations from the HSRA Technical Panel.
- While these changes are being researched and enacted it is unreasonable to place a prohibition on *Bos taurus* exports that cross the equator. This will significantly affect the trade to Japan and China, but there is little evidence of systematic heat stress issues in these trades.

3.1 INTRODUCTION

Almost causing as much concern to ALEC as the TAC's stocking density recommendations are the recommendations relating to heat stress. There are seven recommendations that relate directly or indirectly to heat stress. These are:

> *That the standards prevent Bos taurus cattle from an area of Australia south of latitude 26° south being sourced for export on voyages that will cross the equator between 1 May to 31 October (inclusive), unless an agreed livestock heat stress risk assessment indicates the risk is manageable. [Note: if Recommendation 23 is accepted, this specific provision would not be required, as the heat stress risk assessment requirement would apply for these and all other voyages.]* – Recommendation 1.
>
> *That the standards prevent pregnant Bos taurus cattle being sourced for export on voyages that cross the equator from 1 May to 31 October (inclusive)* – Recommendation 2.
>
> *That the standard prevent Bos taurus cattle with a body condition score of four (4) or more being sourced for export from, or exported through, any area of Australia north of latitude 26° south from 1 October to 31 December (inclusive)* – Recommendation 3.
>
> *That the standard adopt an allometric approach for calculating on–board stocking densities for sheep, with a k–value of 0.030 to be applied to the voyages during November to April, and a k–value of 0.033 for voyages during May to October* – Recommendation 20
>
> *That the standards be revised to require the application of an agreed heat stress risk assessment for all livestock voyages that cross the equator, at all times of the year, from all Australian ports* – Recommendation 23.
>
> *That once the (separate) review of the heat stress risk assessment model is completed, the testing criteria in the standards should be revised to support the new model* – Recommendation 24.

That the period 1 May to 31 October continue to be applied as defining the 'northern summer' in the relevant sections of the revised standard – Recommendation 25.

Recommendation 20 was addressed in the last chapter of this submission. In this chapter ALEC provides comment on the remaining heat stress recommendations.

3.2 ALEC'S GENERAL VIEW OF HEAT STRESS

As part of a wider set of reforms to make ASEL more outcomes focussed and to ensure animal welfare, ALEC is conceptually supportive of applying the heat stress risk assessment model more generally than its current use to the Middle East - as the need is demonstrated. The following recommendation was made in ALEC's submission to the Heat Stress Technical Panel.

ALEC recommends that research be undertaken to better understand the importance of heat stress across all significant markets and to explore the further application of the HSRA model as required.

This recommendation and conceptual support for applying the heat stress risk assessment model more generally is conditional upon the objective of the HSRA remaining based on a measure that is simple to collect and explain, robust, objective, reliable and repeatable. The current objective of the HSRA model is to reduce welfare risk by using settings based on mortalities (being a 2% probability of 5% mortalities by line of livestock on a voyage) – mortalities meets all the aforementioned required characteristics of a measure and more. ALEC understands the HSRA model objective and other matters related to the HSRA model are being considered by the HSRA Technical Reference Panel. As ALEC has submitted to this Panel, until a new measure meeting the above characteristics has been identified, scientifically validated and tested, the HSRA objective should remain focussed on mortalities.

In particular, ALEC is opposed to changing the HSRA model using the method suggested by Dr Michael McCarthy on the basis that this method lacks scientific integrity. As ALEC has explained in a detailed submission to the HSRA Technical Panel taking a probability distribution established for one measure (mortalities) and applying it to a substantially different measure (heat stress levels defined by a combination of factors including panting scores and animal "demeanour") by simply shifting the former distribution by an arbitrary amount is statistically and scientifically defective.

3.3 PRACTICAL ISSUES WITH THE TAC'S RECOMMENDATIONS

Although ALEC has no conceptual objections to applying the heat stress risk assessment model more generally as the need is demonstrated, potentially significant practical problems arise from the TAC's recommendations.

The TAC's primary recommendation in the area of heat stress is Recommendation 23 - *That the standards be revised to require the application of an agreed heat stress risk assessment for all livestock voyages that cross the equator, at all times of the year, from all Australian ports*.

ALEC draws the attention of the TAC to the fact that this recommendation will require a major revision to the HSRA model irrespective of any recommendation for change that may emerge from the deliberations of the HSRA Technical Reference Panel. The time it will take to revise the HSRA model to address all voyages (not just those to and through the Middle East) is uncertain, but for reasons that are discussed below may well take years.

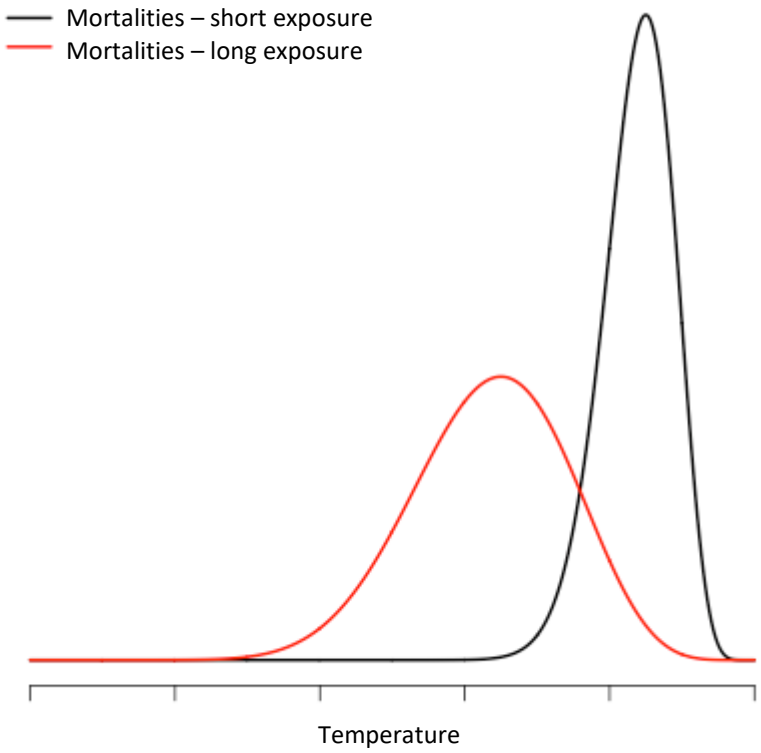
The current application of the HSRA model is for voyages to and through the Middle East during May to October. This limited application has enabled a number of simplifications to be applied when formulating the HSRA model. Wider application will render these simplifications invalid.

As is pointed out in ALEC's submission to the HSRA Technical Panel, it is well known that livestock welfare outcomes, including mortalities, are affected by:

- The level of wet bulb temperatures, and
- The length (duration) of exposure to high wet bulb temperatures. Ideally, duration of exposure needs to take into account both the number of days of exposure and any diurnal variation in temperatures. Experimental studies have shown that heat stress builds up over time in response to high temperatures[13].

The interaction between severity of exposure and duration of exposure is illustrated in Figure 3.1. If exposure to higher temperatures is long, livestock will die at lower temperatures – so the probability distribution of welfare impacts (including mortalities) will be flatter (as shown in red in Figure 3.1). For short duration exposures welfare impacts (including mortalities) mortalities will occur at higher temperatures and the distribution will be more compressed (as shown by the black line in Figure 3.1).

Figure 3.1: Probability distribution of livestock mortalities for two different durations



This interaction severely complicates the HSRA model. However, this interaction could be pragmatically disregarded for voyages to and through the Middle East for the months of May to October. For these voyages the reason that duration of exposure could be placed to one side is that only limited relief from higher wet bulb temperatures occurs as vessels travel north – in fact, in the peak summer months wet bulb temperatures increase.

[13] See, for example, Stockman, C.A., 2006.

The following information has been drawn from the original Maunsell Australia report and describes changes in peak wet bulb temperatures as vessels travel further north in the months of May to October.

- The region around the equator is characterised by wet bulb temperatures that are relatively uniform throughout the year, mostly around 25°C to 26°C.
- A little further north in the middle of the Arabian Sea mean wet bulb temperatures peak at 26.7°C.
- For journeys through the Red Sea:
  - Mean wet bulb temperatures in the Gulf of Aden region (the entry to the Red Sea) peak at a value of 27.7°C.
  - In the middle to top of the Red Sea mean wet bulb temperature peak at a value of 27.4°C.
- For journeys through the Persian Gulf:
  - In the eastern approaches to the Straits of Hormuz (the entry of the Persian Gulf) wet bulb temperatures peak at 28.7°C.
  - In the central and southern parts of the Persian Gulf mean wet bulb temperatures peak at 29°C.
  - In the north of the Persian Gulf wet bulb temperatures peak at around 33°C.

ALEC recognises that the situation is slightly more complicated than conveyed above, as peaks in wet bulb temperatures across regions do not always occur in the same month and the pattern is a little different for each month. However, the general point being made above continues to hold, even when these complications are taken into account. This general point is that limited relief occurs from wet bulb temperatures experienced at the equator as the vessel travels north – to the contrary, mostly wet bulb temperatures further increase.

This same pattern, however, does not exist for voyages to China and Japan during the months of May to October. For these voyages, other than the very peak months of summer, once the vessel crosses the equator wet bulb temperatures drop considerably as the voyage proceeds further north.

For the two months (July and August) representing the peak of summer, as the vessel travels north after crossing the equator, maximum wet bulb temperatures do not drop, but neither do they significantly increase. For these two months maximum wet bulb temperatures remain at about the same level as the vessel travels further north, but even then the daily variation increases.

If the HSRA model were to be applied to voyages to Japan and China for the months of May to October this peaking and subsiding pattern of wet bulb temperatures would need to be taken into account – that is, duration of exposure to various levels of wet bulb temperature would need to be included in the model.

Inclusion of duration in the HSRA model is by no means a simple task and would require a complete re-consideration of the model structure. If duration is to be taken into account, for each wet bulb temperature there will be multiple probability distributions associated with different levels of duration. Moreover, to take duration into account the probability distribution of possible temperatures for each day of the voyage would have to be calculated, including the diurnal variation in these temperatures. There will no doubt be an association between probability distributions for temperatures on successive days – the distributions will not be independent. These probability distributions would have to be multiplied together to derive information on the probable duration of various temperatures for the voyage as a whole.

As Maunsell Australia have noted, it was an early ambition to include duration in the HSRA model. This ambition was abandoned, however, due to the complexity of implementation. Although there have been advancements in computer technology since the initial HSRA model development in December 2003, this complexity may still not be easily overcome.

Rather than assume this complexity can be overcome, as the TAC do in recommending that *"the standards be revised to require the application of an agreed heat stress risk assessment for all livestock voyages that cross the equator, at all times of the year, from all Australian ports"*, a more measured recommendation would be for research to be undertaken:

- To identify the extent of heat stress risk arising from voyages not incorporated in the current HSRA model:
  - undertaken to the Middle East in months other than May to October, and
  - to destinations other than the Middle East at any time of year.
- The potential for modifications to be made to the HSRA model to address identified areas of heat stress risk.

This staged approach to considering heat stress risk may result in:

- Identification of a subset of voyages, in addition to those to and through the Middle East, where a significant potential exists for heat stress risk.
- Still being able to apply pragmatic simplifications to the HSRA model for these voyages rather than attempt to build a HSRA model that could apply to every voyage (note, the development of any model entails the introduction of simplifying assumptions appropriate to the circumstances to which the model is to be applied).

The staged approach will also allow a "value proposition" to be developed for any extension to the HSRA model. In the absence of such research this value proposition does not exist (i.e. there must be a demonstrated need for extension of the HSRA model to other situations). The concept of developing a value proposition is further explored in the next section.

3.4 ARE EXPENSIVE HSRA MODEL MODIFICATIONS WARRANTED TO ACCOUNT FOR ALL VOYAGES?

As noted, ALEC is not conceptually opposed to applying the HSRA model to all voyages, but modifications to the HSRA model will be complicated and expensive and a benefit / cost case is needed before such work commences – this is what stage 1 in the ALEC recommended approach is designed to achieve. From the TAC's draft report on changes to ASEL, it seems that the recommendation to apply a heat risk assessment to all voyages was not supported with a benefit / cost analysis.

Undertaking a benefit / cost analysis would be a significant undertaking and will not be attempted in this submission. However, limited reasoning and data analysis reveals that it is by no means clear that the benefit / cost analysis would support a heat risk assessment being undertaken for all voyages, particularly if changes to the HSRA model prove to be expensive (which, in the view of ALEC, they are likely to be).

Applying the HSRA model *to all voyages* crossing the equator would involve developing model capability to handle voyages that are almost certainly of low heat stress risk. For example, model capability would have to be developed to analyse for heat stress risk shipments of tropical breeds of cattle (*Bos indicus*) from the tropics (northern Australia) to the tropics (Southeast Asian destinations,

including Vietnam and even parts of Indonesia). Is there likely to be issues with heat stress for these voyages?

Equally voyages involving *Bos taurus* cattle exist where evidence of heat stress being an issue is lacking. In particular, mortality data reported for all voyages since 2004 does not indicate a need to mandate use of a heat risk assessment for cattle shipped to Japan and China. Table 3.1 summarises this data for the northern summer months (May to October) and for the rest of the year (November to April). As can be seen from Table 3.1, given that voyages to Japan and China are long haul, mortalities across all of the year are low, but they are paradoxically slightly lower in the northern hemisphere summer (May to October) than the northern hemisphere winter (November to April).

Table 3.1: Mortality rates for cattle shipments to Japan and China by time of year – all data included in on-line spreadsheets by DAWR.

Time of year	Average mortality rates (%) by voyage destination*	
	Japan	China
May to October	0.12%	0.11%
November to April	0.14%	0.13%

*Total cattle mortalities divided by total cattle shipped

As has been stated on numerous occasions in this submission already, ALEC accepts that mortalities represent only one measure of animal welfare, but it is the only measure that has been consistently collected and reported (including being stored in an accessible form). Data collection is about to commence and be reported for a more general set of animal welfare indicators. Is it not worthwhile to: (i) wait until a sufficient amount of more general animal welfare data has been collected; (ii) then undertake analysis of this data in order to determine whether a more general application of the HSRA model is warranted; rather than assume it is warranted and mandate application of the HSRA model to all voyages?

ALEC submits that analysis of historical data in itself represents a type of heat stress risk assessment (without the need to apply a complicated model, such as the HSRA model). Where an existing trade has a demonstrated history of low heat stress risk (as evidence from the mortalities data, the additional welfare data for which collection will soon commence creating an historical record in the future, and from investigation reports), this trade should be allowed to continue without additional constraints being imposed.

3.5 Research into heat stress needed before implementation of Recommendation 1

Until the research outlined above is completed ALEC strongly opposes Recommendation 1:

> *That the standards prevent Bos taurus cattle from an area of Australia south of latitude 26° south being sourced for export on voyages that will cross the equator between 1 May to 31 October (inclusive), unless an agreed livestock heat stress risk assessment indicates the risk is manageable. [Note: if Recommendation 23 is accepted, this specific provision would not be required, as the heat stress risk assessment requirement would apply for these and all other voyages.]*

This recommendation would prevent *Bos taurus* shipments to China and Japan (and to other destinations) for six months of each year unless a heat stress risk assessment has been completed.

As pointed out in the previous section, the current version of the HSRA model has no capacity to address the types of environmental conditions that prevail on voyages to Japan or China. Moreover, to adequately address these conditions in a HSRA model may involve a complete reconstruction of the existing model which will take time. Given the length of time taken to develop and validate the existing HSRA model, and having regard to the extent and complications associated with model extension to cover global conditions (rather than just those to the Middle East), it is entirely possible that changes may take years to implement as a number of steps are involved:

- Theoretical research into how the model might optimally be modified to account for all voyages
- Collection of initial data
- Applied research into model modifications in light of the data collected
- Testing / validation of various ways to change the existing model
- Making further changes in light of testing / validation until satisfactory results are obtained.

Changes to the HSRA model may be made even more complicated by recommendations from the HSRA Technical Panel.

ALEC presumes that the TAC's Recommendation 1 was not meant to enter into force until work on the HSRA model had been completed – which, as noted, may take some time. However, ALEC's presumption is not explicitly stated in the draft report. As read, under Recommendation 1, no *Bos Taurus* shipments could occur between May and October (other than to the Middle East – because these shipments are already included in the HSRA model) until a new HSRA model had been developed and tested.

If ALEC's presumption is correct, it needs to be explicitly stated. If it is incorrect, ALEC submits that new regulations imposing prohibitions, as reflected in Recommendation 1, should not be introduced without strong evidence of need. In order to justify Recommendation 1 evidence is required that:

- For each voyage / destination for which the prohibition is to apply strong evidence exists of heat stress impacting on animals while onboard the ship.
- The heat stress issues for which evidence is produced above apply across each of the months May to October.

ALEC submits that this evidence is missing and, therefore, no recommendation should be made prohibiting *Bos taurus* exports during May to October.

3.6 Definition of May to October as the northern summer

One of the TAC's recommendations is to continue to define the northern summer as May to October.

The major impact of the definition of the northern summer is on stocking rates – with extra space for southern cattle, sheep and goats exported during May to October.

In addition to stocking rates, ALEC could find the following clauses in the reformatted ASEL that use this definition of the northern summer:

1A.3.2 (d) (ii) *Bos taurus* cattle from an area of Australia south of latitude 26° south must not be sourced for export on voyages that will cross the equator between 1 May to 31 October (inclusive) unless:

A. an agreed livestock heat stress risk assessment indicates the risk is manageable as per the testing criteria specified in these standards, and

B. if female, have been determined to be not detectably pregnant and tested in accordance with requirements of a valid *pregnancy test*.

1A.3.4 (f) The following classes of livestock must not be prepared for export by sea to the Middle East during the period from 1 May to 31 October:

(i) For sheep and goats held in paddocks at the *registered premises*:

a. pastoral sheep and station sheep

b. sheep less than 34 kg and with no permanent incisors, and

c. sheep and goats that have been held on trucks for more than 14 hours.

4G.1.1 A valid *pregnancy test* for breeder cattle or buffalo must: ….

(d) be evidenced by written certification by the person carrying out the test that the animal is no more than the following maximum days pregnant at the scheduled date of discharge:

(i) For export by sea—190 days for cattle and 220 days for buffalo, or, if the export involves female *Bos taurus* cattle crossing the equator between 1 May and 31 October (inclusive), that the animal is not detectably pregnant.

ALEC's view is that, ideally, no definition should be needed for the northern summer since any adjustments to treatment (e.g. to allocate extra space for certain types of animals) should be determined by application of a heat stress risk assessment. However, as pointed out previously in this chapter, it may not be worthwhile to develop heat stress risk assessment procedures for every voyage and livestock type.

Pragmatically, therefore, ALEC accepts certain semi-arbitrary provisions may need to apply where a heat stress risk assessment cannot be conducted – but semi-arbitrary provisions should be confined to these circumstances. Where a heat stress risk assessment can be conducted the results from this should take precedence. As highlighted in Chapter 2, a heat risk assessment has been mandated for voyages to the Middle East. It is ALEC's view that results from this should be used to determined stocking densities, not the arbitrary application of an allometric rate using a k-value of 0.033 (or that determined from the heat stress risk assessment whichever is the greater).

Climatic conditions to the Middle East can vary considerably across the months May to October. In some of these months, for vessels with good ventilation, application of a heat stress risk assessment may result in stocking rates greater than those determined allometrically using a k-value of 0.033. Not to allow stocking rates to be applied that have been calculated from appropriately calibrated heat stress risk assessment procedures only penalises consignments on the best vessels – it disincentivises investment in good vessel ventilation and other aspects of vessel design. ALEC opposes arbitrarily using higher space allocations for the months May to October if a heat stress risk assessment has been undertaken.

3.7 Export of Bos taurus cattle with a body condition score of four (4) or more

Finally, ALEC wishes to comment on the TAC's Recommendation 3:

> *That the standard prevent Bos taurus cattle with a body condition score of four (4) or more being sourced for export from, or exported through, any area of Australia north of latitude 26° south from 1 October to 31 December (inclusive)*.

The current ASEL provision is that:

> *Fat [body condition 4 or greater using the new measurement definition of body condition] Bos taurus cattle must not be sourced for export from or through the ports of Darwin, Weipa or Wyndham from 1 October to 31 December (inclusive).*

The recommendation of the TAC considerably extends the current ASEL standards – and the reasons for this extension are unclear. Latitude 26° south is fractionally north of the township of Noosa in Queensland. Why this latitude was chosen, and the reasons for specifying the period October to December, is unknown.

Prohibitions on the export of *Bos taurus* cattle from northern Australia with body condition score 4 should only be considered if there is clear evidence to support such an approach – and the prohibition should only apply to the period and areas where such clear evidence exists.

ALEC is unaware of clear evidence that would support a prohibition on the export of "*Bos taurus cattle with a body condition score of four (4) or more being sourced for export from, or exported through, any area of Australia north of latitude 26° south from 1 October to 31 December (inclusive)"*.

4 RECOMMENDATIONS ON TIME AT REGISTERED PREMISES AND THE DEFINITION OF "CLEAR DAYS"

SUMMARY

ALEC opposes the TAC's definition of "clear days" in registered premises as not reflecting operational realities. Adhering to the TAC's recommendations may affect high standards of animal welfare in registered premises.

4.1 COMMENTARY OF THE TAC'S RECOMMENDATIONS DEFINING CLEAR DAYS

Of considerable concern to ALEC is the TAC's recommendations defining clear days at Registered Premises. There are a number of recommendations which involve either defining clear days or applying this definition to different circumstances. These recommendations are:

> *That for sheep held in sheds at the registered premises, the standard require they be given at least one 'clear day' between shearing and loading for export* – Recommendation 6.
>
> *That the term 'clear day' be defined in the standard as a full day (midnight to midnight) during which livestock are not subject to any feed or water curfew, and are not handled, treated (including shearing) or moved from their holding pens or paddocks* – Recommendation 9.
>
> *That the standards require sheep and goats to be held at the registered premises for five clear days, irrespective of the location and design of the registered premises, the time of year, or the length of the export voyage* – Recommendation 10.
>
> *That the standards require all classes of cattle travelling on short and long haul voyages to be held at the registered premises for a minimum of two clear days, irrespective of the location of the premises and the number of loading/discharge ports on the voyage. Three clear days should be required for all classes of cattle travelling on extended long haul voyages* – Recommendation 11.
>
> *That the standards require buffalo to be held at the registered premises for a minimum of five clear days, irrespective of location of the premises, length of intended voyage or number of loading/discharge ports* – Recommendation 12.

With the exception of Recommendation 9, ALEC accepts these recommendations. In accepting these recommendations ALEC recognises that for short haul cattle voyages ALEC's submission on the Issues Paper argued for retention of the ASEL current standards. Current standards for short haul cattle voyages require 1 clear day in registered premises, except for one port loading and discharge where the standard requires 24 hours. Notwithstanding the fact that the TAC's recommendation for short haul voyages, extends the time in registered premises to a minimum of two clear days, adding significantly to costs, ALEC will accept this recommendation. Although the evidence on length of time in registered premises for short haul voyages is arguable, ALEC notes that the TAC has provided some evidence (albeit anecdotal) in its draft report to support Recommendation 11.

To allow for extenuating circumstances, however, ALEC suggests a slight modification to Recommendation 11 by adding a sentence "*For short haul voyages the minimum time in registered premises of two clear days may be reduced at the discretion of an Authorised officer*". This discretion is recommended in order to address unplanned problems in the receipt of a small number of livestock. Circumstances may exist where it is in the welfare interests of all animals in the shipment

not to spend additional time in registered premises in order that a small number can comply with the two clear days requirement.

The greatest difficulty, however, of ALEC with Recommendations 10-12 is the definition of a "clear day". This definition is provided in Recommendation 9 - *that the term 'clear day' be defined in the standard as a full day (midnight to midnight) during which livestock are not subject to any feed or water curfew, and* ***are not handled, treated*** *(including shearing) or moved from their holding pens or paddocks* [our emphasis]. Depending on how "handled, treated" are in turn defined, in the view of ALEC the recommendation is not practical and, if possible to implement, may be done so at the cost of animal welfare.

Given the definition of "clear days" Recommendations 10 to 12 variously provide for livestock to spend two to five days in registered premises *without being handled or treated*. This is despite the fact that the TAC notes that an advantage of time in registered premises is that it allows for animals to adapt to human interaction.

Currently exporters attempt to limit interaction with animals once they arrive at registered premises and are unloaded from trucks. This limited interaction allows animals to be accommodated in registered premises and swiftly provided with water and feed – this is considered important in terms of animal welfare.

- For instance, ear tags, used by exporters in meeting their ESCAS obligations, are often not inserted on arrival, but after animals have been accommodated in registered premises and provided with water and feed – in the view of exporters this results in better animal welfare outcomes than would occur if an ear tag is inserted on arrival. Also, for cattle, pregnancy testing and vaccinations are applied once they are in registered premises.
- For sheep shipments some exporters to some markets (depending on protocols, etc.) undertake only limited drafting on arrival. Later during their time in registered premises a management draft occurs where animals are sorted by type / weight category, with an attempt also made to identify those with health issues or inanition. In the view of these exporters this results in better animal welfare outcomes.

The TAC's definition of two clear days will encourage exporters to concentrate treatments on arrival and may have adverse implications for animal welfare.

For sheep there are also practical issues to be addressed. For example, in a large sheep shipment it is possible that in excess of 20,000 sheep may require shearing. This may be timed over a 10 day period as sheep in pens are rotationally sheared.

It is unclear from the draft recommendations whether the clear days must be consecutive days and also whether they must be the last days before loading. Requirements in some protocols that require treatments shortly before loading would make the last requirement impossible to meet. A requirement of consecutive days would also be very difficult / impossible to meet.

For one market that requires, as part of the protocol, that sheep spend eight days in registered premises the following activities take place:

- Sheep are received and those that do not require shearing are drafted and placed into pens.
- For those sheep requiring shearing, depending on the size of the shipment, shearing occurs over a number of days. Once shorn these sheep are then drafted and placed into pens.
- Once all animals are in pens treatments to meet protocol requirements are commenced. Multiple treatments, where possible, are administered simultaneously so that sheep spend

minimal time away from the pens. However, this is not always possible. Applying treatments can take a number of days. Three separate treatments are required for the example protocol market.

- The only way to meet the TAC's recommendations on time and clear days in registered premises, both practically and without incurring grossly excessive costs, would be to rush animals through shearing and the various treatments at the beginning of time spent in registered premises – the period in which animals are still recovering from the land transport journey.

Finally, it is not clear from the TAC's definition of "clear days" whether all the pen is affected by a few animals in the pen being handled or treated.

ALEC submits that the TAC recommendation on clear days is not in the best interests of animal welfare and the definition should revert to that currently found in the ASEL standards. On the grounds on animal welfare, ALEC strongly opposes the TAC definition of "clear days".

5 RECOMMENDATIONS ON BEDDING AND FEED

SUMMARY

- The volume of bedding required will vary depending on many factors particular to the individual voyage being undertaken and the type / quality of material used. This makes it impossible to define in regulation specific amounts of bedding to be carried. The regulation is, therefore, better specified in terms of outcomes required rather than inputs required.
- The feeding reserves recommendation of the TAC lacks proportionality and will result in economic and environmental waste. Again, regulation would be better specified in terms of outcomes required rather than inputs required.

5.1 INTRODUCTION

The TAC has made a number of recommendations on the provision of bedding and the amount of feed to be carried (see Recommendations 29 to 40). ALEC will provide detailed comments on just two of these:

> *That the standards require that cattle and buffalo on all voyages are provided with sufficient sawdust, rice hulls or similar material to be used for bedding at a minimum rate of 4 tonnes per 1000m^2 per application, with a minimum of 4 tonnes per 1000m^2 provided after each washdown* – Recommendation 32.

> *That in relation to 3A.3.2, the statutory* [feed] *reserve should be increased to 4 days for all voyages longer than 10 days, regardless of species (while maintaining the current requirement for a 7 day fodder reserve for all voyages travelling through the Suez Canal)* – Recommendation 39.

In commenting on Recommendation 32 ALEC will also directly refer to TAC Recommendation 29.

5.2 COMMENT ON RECOMMENDATION 32 SPECIFYING BEDDING INPUT REQUIREMENTS OF 4 TONNES PER APPLICATION

In terms of bedding management requirements ALEC believes that Recommendation 29 should be sufficient as it refers to the outcomes required:

> *That the standard require bedding management, including deck wash downs and replacement of bedding materials, to be sufficient to ensure good welfare outcomes for livestock, in particular, minimising slipping and abrasions, lameness, pugging and faecal coating* – Recommendation 29.

As noted in W.LIV.0254, "*experienced veterinarians and stockpersons assert the real and principal benefit of using bedding is not to provide a comfortable resting place (as might be envisaged by the general public) but to minimise leg and feet injuries*". Recommendation 29 references "*minimising slipping and abrasions, lameness"* as the primary outcome required from bedding management as well as a number of other outcomes.

In terms of measuring outcomes ALEC notes that Independent Observers now accompany every voyage. In addition, part of the mandated end of voyage reporting provisions to be implemented is commentary on "*conditions of decks and bedding*". These independent mechanisms (reports from Independent Observers and AAVs) provide abundant opportunity for the regulator to be alerted if the outcomes in Recommendation 29, for a particular voyage, have not been met – that is, if bedding management, including deck wash downs and replacement of bedding materials, was

insufficient *to ensure good welfare outcomes for livestock, in particular, minimising slipping and abrasions, lameness, pugging and faecal coating*.

5.2.1 Variability in key factors means that it is impossible to be prescriptive, with any degree of accuracy, over bedding input requirements

ALEC does *not* believe it is appropriate to specify input requirements (amount of bedding materials per application) as well as the outcomes required. The TAC itself has stated that there are challenges involved in being "*prescriptive in the amounts [of bedding] to be provided*". ALEC would submit there are more than challenges involved – it is *impossible* to be prescriptive of the amounts of bedding that are required with any degree of accuracy. This is because the amount of bedding required will be dependent on the type of livestock being transported (with weight being important, but also other attributes), factors associated with the ship (including flooring, air delivery and ventilation design, configuration, ship design and size and trim), other influencing events (fodder type and feeding, stocking density, actual and anticipated weather conditions and voyage duration and eventual destination) and the type / quality of the bedding material actually used.

The last of these factors requires further comment: that considerable variation exists across the type / quality of bedding used. As an example, the absorption capacity of various bedding materials can vary by 100%[14]. Exporters report that wood shavings represent a significantly superior bedding to sawdust and are lighter, but there is no recognition of this in the TAC's recommendations. *Being prescriptive over quantities can only be logically supported if qualities are relatively uniform – this is not the case*.

A principal conclusion of a literature review undertaken in late 2016 by Dr Thomas Banhazi and Dr Michael McCarthy was as follows:

> *The report notes how it is difficult (if not impossible) to be prescriptive about bedding management and that management strategies are modified and amended in response to the interplay of a large number of factors. It is strongly influenced by the way in which events unfold during the course of a voyage. The principles involved however, appear to be well understood by industry personnel.*

If it is impossible to be prescriptive, how can the TAC be certain that carrying bedding materials in whatever amounts will lead to animal welfare improvements? This is especially the case if the principles involved are *well understood by industry personnel* and can be applied against the particular circumstances faced for each voyage.

5.2.2 Evidence from AAVs cautions against being prescriptive

Evidence from AAVs also highlights the perils of being prescriptive over bedding input requirements. There are two sources of this evidence.

First, in December 2016, an AAV Workshop was held in Melbourne by LiveCorp and ALEC. There was little support from AAVs at the workshop for increasing the sawdust / bedding required under ASEL and in contrast, there was a strong view that it was unnecessary. The AAVs largely considered sawdust was a tool best used strategically for at risk animals or in hospital pens, with additional sawdust most likely to be wasted / dumped. The workshop also noted that there had been advances in flooring that minimised abrasions and that feed availability had as much influence on foot injuries / abrasions as sawdust. Further R&D was suggested in both these areas and the proposed path

[14] Banney, S., Henderson, A., Caston, K., 2009, "Management of Bedding during the Livestock Export Process", *Final Report Project W.LIV.0254*, Meat & Livestock Australia, March.

forward identified by the consultants, who were involved in conducting and reporting on the workshop, was that the current ASEL bedding requirements do not need to be changed.

Second, four views on bedding were expressed by AAVs in their submission to the ASEL Issues Paper. The four views expressed by AAVs can be summarised as follows:

- Opinion 1: *Provision of some bedding should be provided on all voyages …. [Bedding should be] particularly based on stocking type ….. [and] tailored to the boat.*
- Opinion 2: *Available bedding on long haul voyages is generally insufficient … [B]edding requirements .. is especially critical for long haul voyages and extended long haul voyages where deckwashing is limited due to extended periods in protected/regulated waters etc.*
- Opinion 3*: I consider the current recommendations are sufficient – especially if rational judgements are made by the management team.*
- Opinion 4: *My observations are that there is no difference in welfare or health* [arising from the amount of sawdust / vacuumed wood shavings used]*. The main use is for mopping up flooded areas – usually following wash down. I am not convinced that a 1 cm layer of sawdust at loading is of any benefit in lameness or moisture control – and causes eye problems. Use of sawdust/wood shavings at the discretion of the management team is a more sensible and considered option*.

No AAV suggested that a certain amount of bedding should be universally applied. In fact, AAVs highlighted various circumstances where different amounts of bedding were appropriated based on "stocking type", "tailored to the boat", length of voyage, "periods in protected / regulated waters" and the number of "wash downs". Two AAVs stated that current specifications were sufficient and one stated some bedding should be provided on all voyages relative to the characteristics of the voyage. What is evident in the AAV submission is that different veterinarians and stockmen approach bedding management in different ways with apparently little difference in welfare outcomes:

> *"One stockman would use all the sawdust on board on his two allocated decks while others on the same ship would use none. My observations are that there is no difference in welfare or health".*

No overwhelming view is evident in the statements by AAVs that bedding requirements need to be vastly increased (more than doubled in some cases).

5.2.3 Severe logistical challenges with the TAC's recommendaton

Finally, there are severe logistical challenges in the TAC's recommendations. The amount of bedding required under current ASEL regulations and under the TAC's Recommendation 32 for a 22,000 m^2 vessel carrying breeding cattle to Russia with four washdowns is shown below[15]:

- Current ASEL regulations: 7 x 22 = 154 tonnes.
- TAC recommendation: 22 x 4 x 4 = 352 tonnes.

As can be seen from the above, the amount of bedding material required for this voyage more than doubles. Sawdust / shavings normally come in one tonne lots - bags on a pallet strapped and shrunk wrapped for lifting onboard the vessel. One tonne lots are large volumetrically and this creates a considerable storage challenge. In the experience of exporters this volume of bedding is unlikely to

[15] For extended long haul voyages the TAC's recommendation is that "*bedding requirements … be agreed in the long haul management plan"*. Many voyages to Russia fall outside those classified as extended long haul. Also, it is unlikely, that provisions for extended long haul will be less than those specified for long haul.

be ever used. It is doubtful that the crew / stockpersons would have ability or see the need to spread this amount of sawdust per wash.

5.2.4 Prescription results in economic and environmental waste

Being prescriptive over bedding requirements will lead to unnecessary waste, without necessarily resulting in any improvement in animal welfare. This waste is both economic (purchasing, sourcing and carrying bedding material) and environmental (e.g. from dumping unused bedding because of length of voyage, different wash down routines and better ventilated vessels). ALEC estimates that the economic costs will be about $7 million per annum. Being prescriptive over bedding requirements also discourages innovation and investment in areas such as vessel design leading to long term economic and environmental costs and lower welfare outcomes.

For the additional costs arising from a prescriptive input based approach to bedding to be justifiable, the TAC needs to present convincing evidence that a commensurate improvement in animal welfare will occur. ALEC is unaware of the existence of any such convincing evidence. To the contrary both literature reviews and statements from AAVs lead to severe doubts that welfare improvements will occur.

5.2.5 Conclusion on bedding

There has been a tendency in previous ASEL reviews, and now in the current review, to focus too heavily on sawdust and the volume of sawdust/bedding required. R&D and AAVs have reasonably consistently pointed to sawdust as mainly a *strategic* tool. For all of the key concerns that sawdust is supposed to address – abrasions / lameness; pen environment / pad stability; and ammonia emissions – there are other significant factors influencing the outcomes. Care, therefore, needs to be exercised in over-stating the role of bedding / sawdust, or ignoring the influence of other factors, in delivering good outcomes or resolving issues that arise. There is a substantial risk that an ongoing focus on simplistic, standardised approaches will not yield the desired results.

It is ALEC's view that the outcomes based specification for bedding should be sufficient – but recognising that minimising slipping and abrasions, lameness, pugging and faecal coating arises from many operational factors, not just bedding. If, notwithstanding the arguments contained in this section for an outcomes only approach to bedding (and recognising the recently introduced role of Independent Observers in this regard), the TAC continues to be of a view to also specify inputs, ALEC also would not oppose the current ASEL provisions being retained. However, ALEC does not support increases in bedding requirements for an unproven welfare benefit.

5.3 COMMENT ON RECOMMENDATION 39 INCREASING THE STATUTORY FEED RESERVE TO FOUR DAYS

The TAC recommendation for 4 days fodder reserves for voyages longer than 10 days lacks proportionality. On an 11 day voyage the fodder reserve is 36% of requirements; on a 30 day voyage it is 13% of requirements.

Presumably the recommendation is aimed at providing a reserve for unanticipated port and weather delays. Yet the TAC provides no evidence of the extent of port and weather delays to support their recommendation of four days reserves, despite anticipated and actual voyage duration data being presumably available from the department. Neither does the TAC provide any information on the process it used to arrive at a conclusion for four days reserve for all voyages, rather than three days or five days or a percentage. Presumably the extent of delays may depend upon the time of year, route taken, weather likely to be encountered, length of the voyage and port origin and destination

– yet the specification of a rigid 4 days allows none of this to be taken into account (with the exception of travel through the Suez Canal).

As with arbitrarily established bedding input requirements, excessive feed reserves will result in both environmental and economic costs. ASEL provision 3A.3.2(f) provides for feed in excess of needs to be held in storage tanks and this can re-enter Australia. However, AMSA requires fodder tanks to be emptied on a rotational basis to meet Marine Order part 43. For this and a variety of other reasons (especially when vessels are being chartered) a requirement to carry larger feed reserves would increase dumping between voyages.

The recommendation on feed reserves could be more appropriately recast as an outcomes based recommendation. Voyage history and, in particular, estimates of voyage duration and feed use versus actual duration and use would form a major input in determining risks faced in terms of feed use. Feed reserves should be based on these risks and could be specified in the consignment specific export plan. An example of an outcomes based feed reserves regulation is:

> *The quantity of feed available must meet at least the minimum daily feed requirements, which are:*
>
> *(i) Cattle and buffalo—2.5 per cent of their bodyweight, of a quality feed able to meet daily maintenance requirements*
> *(ii) Sheep and goats—3 per cent of their bodyweight per day for sheep younger than 4 tooth and 2 per cent of their bodyweight per day for 4 tooth or older, of a quality feed able to meet daily maintenance requirements, and*
> *(iii) Deer—2 per cent of their bodyweight per day of a quality feed able to meet daily maintenance requirements.*
>
> *Feed reserves should be sufficient to ensure that livestock can continue to be fed in the quantities specified above even if vessel delays occur. The consignment specific export plan (CSEP) under approved arrangements should specify the amount of fodder reserves to be carried based on an appropriately formulated risk assessment.*

6 RECOMMENDATIONS ON ON-BOARD PERSONNEL AND VOYAGE REPORTING

6.1 ON-BOARD PERSONNEL

The TAC makes four recommendations regarding on-board personnel:

> *That the standards continue to require an accredited stockperson to accompany each consignment of livestock* – Recommendation 41.
>
> *That the standards require one competent stock handler (as defined in the reformatted standards) per 3,000 (or part thereof) cattle and buffalo, and/or one per 30,000 (or part thereof) sheep. The standards should allow the accredited stockperson to count towards this requirement* – Recommendation 42.
>
> *That the standards require an AAV to accompany any export consignment where required by the department. Notwithstanding that, an AAV must accompany each consignment on long haul voyages, extended long haul voyages and voyages with pregnant livestock, unless otherwise agreed by the department* – Recommendation 43.
>
> *That the standard not allow the same person to be both the AAV and the accredited stockperson for any given voyage* – Recommendation 44.

These recommendations again suffer from being input based without referencing the quality of the inputs or particular circumstances to which they are to be applied. Enormous differences in quality can occur between different stockpersons and AAVs. It would be preferable for the regulations to reference the tasks expected to be completed by stockpersons and AAVs rather than the number required. In general, it is the experience of the industry that higher numbers of livestock can be handled by a competent stockperson than specified in Recommendation 42. For instance, on a G-class vessel to Indonesia carrying about 3,500 cattle one competent stockperson is sufficient, including addressing any unexpected issues that may arise.

This is an area where the TAC's recommendations push back against the Committee's Terms of Reference, making the regulations even more prescriptive and input based rather than facilitating "*contemporary outcomes based regulation which will allow flexibility in achieving the required animal health and welfare outcomes*". The blanket input prescription provides no incentive to secure productivity improvements through the application of technology and training. An analogy would be to insist that a car manufacturing company uses the same level of labour irrespective of the amount of automation in the plant.

No information is included in the draft report on how the Committee determined that one stockperson is required per 3,000 (or part thereof) cattle and 30,000 (or part thereof) sheep (including the quality of personnel assumed by the Committee and how situations should be addressed where productivity is different to that assumed by the Committee).

ALEC is also puzzled by the TAC's recommendation that "*the standard not allow the same person to be both the AAV and the accredited stockperson for any given voyage"*. The TAC only provides a brief statement in support of this recommendation: *"In the committee's view, the AAV and accredited stockperson are there for specific individual purposes which should not be taken up with duties that would otherwise be filled by one or the other"*. The trend in modern employment agreements is to break down rigidities in work definitions and practices and encourage workplace

flexibility. Again, the TAC should specify outcomes, not how these outcomes are best achieved. On small vessels accommodation can be an issue, noting that there has already been a recent increase in personnel with the addition of the Independent Observer.

Any amendments to the overall manning levels onboard livestock vessels, including the placement of Independent Observers, needs to consider maritime laws and owners requirements surrounding accommodation, life boat capacity, indemnity and safety at sea.

6.2 VOYAGE REPORTING

The voyage reporting recommendations of the TAC are:

> *That the reportable mortality level for sheep and goats should be reduced to 1 per cent, or three animals, whichever is the greater; and that an average daily mortality rate of greater than 0.05 per cent be added to the list of events that would qualify as a 'notifiable incident'* – Recommendation 26.
>
> *That the reportable mortality level for cattle and buffalo should be set at 0.5 per cent, or three animals, whichever is the greater; and that an average daily mortality rate of greater than 0.025 per cent be added to the list of events that would qualify as a 'notifiable incident'* – Recommendation 27.
>
> *That the requirements for daily reports and end of journey reports be updated as per Appendix A and Appendix B* – Recommendation 28.

6.2.1 Reportable mortality rates

As outlined in the Introduction of this submission, ALEC notes that a daily mortality rate of 0.025 per cent is equivalent to a total mortality of 0.08% for a three day voyage to Indonesia. On a G-class vessel carrying fractionally under 4,000 cattle, mortalities of just 3 animals would trigger a notifiable incident (based on the ADMR recommendation).

The TAC's guiding principles in part state that the committee will "*adopt existing Australian animal welfare domestic and livestock standards where applicable*". Either in direct regulation or under semi regulated QA schemes operating domestically ALEC knows of no requirement to report daily mortalities when they exceed a level of 0.025%.

The reasons stated by the TAC for requiring reporting of a mortality event above a threshold is:

- to provide greater transparency to the public;
- to allow for independent investigation, and
- to provide industry with means of demonstrating implementing continual improvement.

As noted in ALEC's previous submission *all* mortalities are provided to Government irrespective of whether or not they reach a "notifiable" level (see provision 7 in Appendix 5.2 of the current version of ASEL). The first and third of the above objectives can be met from this general requirement to report all mortalities – indeed, arguably, the third objective can *only* be met from this general requirement. As for the second objective, independent investigation is not an end in itself, but to achieve some other objective. If this objective is to identify areas for further improvement the question that must be asked is are investigations into "reportable mortality rates" the best mechanism to achieve this?

As observed by the TAC, many factors can contribute to a mortality event for a particular voyage and these are often unpredictable. Of more concern is if there is a pattern of high mortalities over a

number of voyages for a particular exporter, livestock of a particular type or a specific vessel. The TAC has remained silent on the question asked in ALEC's original submission on whether reducing RMRs is the best mechanism for meeting the three objectives listed above (recognising that independent investigation is not an end in itself). It is ALEC's view that the answer to this question is "no".

The main impact of reducing currently mandated RMR's will be to trigger many more investigations that will become administrative burdens for all concerned and likely deliver results that will be inconclusive to better outcomes. Continuing R & D into causes of shipboard mortality, disease prevention measures and, with time, the development of animal welfare indicators, will all provide exporters with better tools to manage live sheep and cattle shipments and ultimately achieve better results.

6.2.2 Animal welfare indicators

ALEC has firmly expressed its support for collection of a wider set of animal welfare indicators than just mortalities – and is currently working with its service provider, LiveCorp, to achieve this.

ALEC, however, notes that many animal welfare indicators and other relevant data are currently collected, but either discarded by the regulator or kept stored in an inaccessible form (ALEC knows not which).

Information currently supplied by industry to the regulator includes a range of environmental data (such as temperatures – both dry bulb and wet bulb, humidity), conditions on board the vessel (ventilation, decks / bedding, maintenance issues) and animal welfare indicators (health and welfare issues, feed and water consumption, respiratory data). Much of this information is supplied on a daily basis as well as at the end of the voyage. It would have been helpful to ALEC and, presumably the TAC, to have had access to this data for the purposes of the current review.

Before additional data is collected, a first step is to ensure that the data currently collected is readily accessible so that it can be put to maximum use.

7 SHEEP SPECIFIC RECOMMENDATIONS

ALEC in this chapter will comment on two sheep specific recommendations – time off shears and space allocations in registered premises.

7.1 TIME OFF SHEARS

Section 1A.3.4 (d) (iii) of the reformatted ASEL still requires sheep to:

Either be:

A. *10 days or more off shears when sourced, if accommodated in paddocks at the registered premises, or*
B. *shorn during the 10 day period before export, and given at least one (1) clear day between shearing and loading for export, if accommodated in sheds at the registered premises.*

ALEC is of the view that a seasonal dispensation should be provided to enable freshly shorn sheep sourced and / or shorn at the registered premise to be held in paddocks.

The reason for the requirement to keep freshly shorn sheep in sheds appears to be hypothermia related. Hypothermia is, however, not a risk in warm weather. In months where mild to warm weather conditions apply (from late spring to early autumn) the standard should reflect an ability to allow freshly shorn sheep to be sourced and paddocked in the registered premises at these times.

By ignoring weather conditions, the standards also fail to reflect variations in environmental conditions existing between Portland in the far east, to Adelaide, to Western Australia. The Port of Portland in Victoria no longer exists as an embarkation port for live sheep export. The climate in Portland is significantly different to Adelaide and Western Australia. In Adelaide and Western Australia sheering and paddocking at registered premises should be permissible from late spring, across summer, to early autumn.

The domestic standards simply state that "*shorn sheep should be given protection during cold conditions and sudden weather changes*. *Protection for sheep around shearing may include: postponing shearing; using stud combs; providing shelter; providing wind breaks; providing additional feed*".

7.2 SPACE ALLOCATION FOR SHEEP IN REGISTERED PREMISES

The TAC under Recommendation 18 significantly increases the space allocated to sheep in registered premises. Current space allocations and those recommended by the TAC are shown in Table 7.1. Also shown in Table 7.1 are space allocations determined allometrically using k-values of 0.020 and 0.033.

Table 7.1: Current ASEL, TAC recommended and allometrically determined minimum space allocations for sheep in registered premises

Sheep liveweight	Current ASEL space requirement in RPs*	TAC recommended space requirement in RPs	Allometric space allocation	
			k-value=0.020	k-value=0.033
40 kgs	0.33m^2	0.50m^2	0.23m^2	0.38m^2
45 kgs	0.33m^2	0.50m^2	0.25m^2	0.41m^2
50 kgs	0.33m^2	0.50m^2	0.26m^2	0.44m^2
55 kgs	0.33m^2	0.50m^2	0.28m^2	0.46m^2
60 kgs	0.33m^2	0.54m^2	0.30m^2	0.49m^2

* Penned in groups of 31 or more animals for less than 10 days.

One of the guiding principles of the TAC is to "*adopt existing Australian animal welfare domestic and livestock standards where applicable*". The domestic standard (as opposed to guideline) for intensive sheep operations is: "*A person in charge must ensure sufficient space to allow all sheep to lie on their sternums at the same time in an intensive production system*" (Standard 9.6, 2016)[16]. Sternum lying is associated with a k-value of about 0.020. As can be seen from Table 7.1 space allocations for sternum lying (k-value of 0.020 in Table 7.1) are below those currently specified in ASEL and very much below those recommended by the TAC.

The TAC used the domestic **guideline** for allocation of space in Intensive sheep production systems. There is a difference, however, in guidelines and regulation (which is important for a number of the TAC's considerations). In terms of the "Australian Animal Welfare Standards and Guidelines for Sheep" in May 2009, primary industries ministers took the position that **guidelines**, regardless of their purpose in existing codes and the new standards and guidelines documents, **will not be regulated**. In particular, agreement was reached that:

> *All future revisions of Model Codes and 'Australian Standards and Guidelines' documents must provide a number of:*
>
> *a. clear essential requirements ('standards') for animal welfare that can be verified and are transferable into legislation for effective regulation, and*
> *b. guidelines, to be produced concurrently with the standards but not enforced in legislation, to be considered by industry for incorporation into national industry QA along with the standards.*

For the TAC to conform to its guiding principle on using domestic standards, the relevant Australian information to reference is "*sufficient space to allow all sheep to lie on their sternums at the same time"*, not the guideline of 0.50m^2. It should be noted that referencing the standard does not prevent exporters (and domestic sheep feedlotters) making a decision to use a higher greater allocation than required by the standards.

There are four further points ALEC wishes to make in terms of space allocations for sheep in registered premises:

First, to the knowledge of ALEC (and it seems the TAC – see p26 of the Stage 2 Draft Report) no systematic welfare issues have been identified with the current housing / space allocations for sheep in registered premises. It is also noted in the TAC's report that: "*little evidence was provided to the committee to support significant changes to current ASEL space allowances at the registered premises*".

Second, the TAC apparently formed the view that "*For livestock at a registered premises ….. an allometric space allocation using a k value of 0.033 is appropriate. This is the value proposed by Petherick et al (2009) as providing the minimum space allowance for long–term confinement of animals with reduced risks to welfare and productivity*" (see p27 of the Stage 2 Draft Report). However, for reasons not fully explained, for sheep and goats, the TAC discarded this view and used instead the domestic guideline of 0.50m^2.

[16] Animal Health Australia, 2016, *Australian Animal Welfare Standards and Guidelines for Sheep, Edition One, Version One, Endorsed January 2016*, Commonwealth of Australia, Canberra, www.animalwelfarestandards.net.au. The development process for The Australian Animal Welfare Standards and Guidelines for Sheep is supported and funded by all Governments, and sheep industries.

Third, the TAC has provided no strong evidence for not using the domestic standard ("*sufficient space to allow all sheep to lie on their sternums at the same time*") or the standard currently embodied in ASEL ($0.33m^2$). As has been stated a number of times in this submission, if current standards are to be ignored and additional costs imposed on the industry, firm evidence is needed that poor welfare outcomes are arising from use of the current standards. In this case the TAC has to demonstrate that the current domestic standard, and that in ASEL, is directly associated with poor welfare outcomes.

Fourth, and importantly, ALEC is concerned that the TAC's recommendation will have unintended consequences and result in a deterioration in animal welfare outcomes for sheep held in registered premises. There are a number of reasons for this:

- Shed space at registered premises is limited. Allocating additional space for each animal will mean that more animals will have to be housed in paddocks. Sheds have some decidedly positive benefits particularly for young sheep (and of course shorn sheep in winter).
- Housing sheep in sheds acclimatises animals to the "shed type" environment on board vessels and encourages mixing of animals from different flocks (socialising).
- Sheds encourage animals onto a pellet diet and gets them used to eating and drinking from troughs with other animals in close proximity.

In the view of ALEC pushing sheep to the paddocks (summer and winter), by providing space allocations in registered premises that are:

- in excess of current domestic standards,
- in excess those specified in ASEL v2.3 (which have worked well since their introduction), and
- in excess of the allometric k-value for long term confinement (noting that less than 10 days in registered premises is significantly less than long term confinement)

cannot be justified and will result in inferior welfare outcomes for the sheep involved.

ALEC supports the existing ASEL standard being retained (but is open to space allocations being referrable to the size of the animal rather than a standard weight - 54 kilograms).

8 SPECIAL CLASSES OF LIVESTOCK

The TAC in its draft report has recommended that:

> *In relation to special categories of livestock, the following approach should apply to on–board stocking densities:*
> - *…. Cattle and buffalo with horns: 30 per cent more space than otherwise required for cattle and buffalo without horns* – Recommendation 22.

Based on limited evidence Ainsworth and McCarthy recommended in LIV.102/SBMR.003 that horned animals be penned together and receive a 10% additional space allowance.

The 30% allocation of additional space as provided in the TAC's Recommendation 22 would seem excessive and was not supported with scientific evidence in the Stage 2 Draft Report – indeed, it is hardly mentioned. The 30% additional space has been traced by ALEC to the Livestock Export Accreditation Program (LEAP) standards of 2001 – but the scientific justification for it is unknown.

The Department released an EAN last year (2017-15) which noted that:

- ASEL requires that cattle sourced for export must not have horns longer than 12cm and horns must be tipped
- Buffalo must not have horns longer than the spread of the ears.
- Cattle and buffalo with horns that meet ASEL requirements are called 'short horns'.
- Cattle and buffalo with horns greater than the ASEL requirements, are called 'long horns'.
- For cattle with horns no wider than 60cm between the outermost edges and for buffalo with tipped (blunt) horns that extend no further than 5cm from the outermost edge of the ears the Department may grant an export permit under certain conditions that includes a 30% greater space allocation.

The TAC recommendation should be made specific to "long horn" cattle and buffalo and scientific justification should be provided.