



## Personal View

## The welfare of Australian livestock transported by sea ☆

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Australia is the largest exporter of livestock in the world, exporting nearly 0.62 million cattle and 2.28 million sheep in 2012.<sup>1</sup> Ninety-nine percent of the sheep were exported to Middle Eastern countries, on journeys lasting approximately 3 weeks. Most Australian cattle have traditionally been exported to South-East Asia and China on shorter voyages, but in 2012 whilst 68% of cattle went to these destinations (Norris and Gorman, 2013) approximately 200,000 cattle went to distant destinations, including Turkey and Russia, on voyages of up to 42 days.<sup>2</sup> Australia's live export trade has been controversial since its inception in the mid-1970s due to ongoing animal welfare issues on live export ships and in importing countries (Caulfield, 2009).

In a review of the welfare of livestock transported by ship, Phillips and Santurtun (2013) concluded that 'there are significant risks to the welfare of livestock caused by transporting them in ships, especially over long distances'. The conclusions of this review applied to livestock export shipments from Australia. This review was accompanied by a Guest Editorial by Australia's Chief Veterinary Officer, Dr Mark Schipp (Schipp, 2013). Dr Schipp is employed by the Australian Government's Department of Agriculture, Fisheries and Forestry (DAFF) which has as core functions both the promotion of the

live export trade and its regulation under Australian law.<sup>3,4</sup> In 2012, the value of livestock exported from Australia, free-on-board, was A\$891.7 million.<sup>5,6</sup> The conflict of interest between promotion of a lucrative trade and regulation of that trade was recognised in a recent move in Australia to establish an Independent Office of Animal Welfare.<sup>7,8</sup> DAFF is in the invidious position of trying to balance the concerns of the public, welfare groups and a growing number of animal welfare scientists and veterinarians, with the financial benefits of the trade and its regulation. It is not surprising, therefore, that the Australian Government's view of welfare of exported Australian livestock, presented by the Chief Veterinary Officer, is positive.

Schipp (2013) made extensive reference to the strengths of the Australian Standards for the Export of Livestock (ASEL),<sup>9</sup> including

<sup>3</sup> See: Livestock at: <http://www.daff.gov.au/biosecurity/export/live-animals/livestock> (accessed 5 December 2013)

<sup>4</sup> See: Office of Animal Welfare: <http://www.melissaparke.com.au/speeches/521-independent-office-of-animal-welfare.html> (accessed 5 December 2013)

<sup>5</sup> See: Australian Livestock Export Statistical review 2012 at: <http://www.mla.com.au/Prices-and-markets/Trends-and-analysis/Beef/Live-exports> (accessed 5 December 2013)

<sup>6</sup> UK£582.6m, US\$923.4m, €718.4m. Conversion using averaged historical rates from 1 January 2012 to 31 December 2012 (<http://www.oanda.com/currency/historical-rates/>).

<sup>7</sup> See: Office of Animal Welfare: <http://www.melissaparke.com.au/speeches/521-independent-office-of-animal-welfare.html> (accessed 5 December 2013)

<sup>8</sup> See: Office of Animal Welfare: <http://bawp.org.au/office-of-animal-welfare/> (accessed 5 December 2013)

<sup>9</sup> See: Australian Standards for the Export of Livestock (Version 2.3) 2011 and Australian Position Statement on the Export of Livestock at: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0010/1904365/australian-standards-v2.3.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0010/1904365/australian-standards-v2.3.pdf) (accessed 5 December 2013).

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<sup>1</sup> See: Australian Livestock Export Statistical review 2012 at: <http://www.mla.com.au/Prices-and-markets/Trends-and-analysis/Beef/Live-exports> (accessed 5 December 2013)

<sup>2</sup> See: Australian Livestock Export Statistical review 2012 at: <http://www.mla.com.au/Prices-and-markets/Trends-and-analysis/Beef/Live-exports> (accessed 5 December 2013)

the findings of a 2006 benchmarking study by Meat and Livestock Australia (MLA) that 'indicated that Australia had . . . world-best live-stock export standards in terms of coverage (of species and phases of transportation) and capacity to deliver acceptable outcomes (measured against animal welfare indicators)'. This may have been, and may still be, the case. However, the comment must be viewed in context as the comparisons were made with other countries that do not ship animals by sea for the same distance and duration as live export voyages from Australia. Furthermore, Schipp (2013) included New Zealand as one of those countries with which Australia was compared in 2006 but did not acknowledge that New Zealand ceased exporting livestock for slaughter<sup>10</sup> in 2007 on the basis that the 'risks to New Zealand's reputation as a responsible exporter' could not be adequately managed.<sup>11</sup>

Schipp (2013) asserted that, since 2006, Australia has made 'further significant improvements, including adoption of sophisticated modelling of heat stress in livestock vessels'. This assessment has been challenged in a recent review of Australia's live export heat stress model (Caulfield et al., 2014). The review found that 'Although the model must be complied with under Australian law, it is not currently available for independent scientific scrutiny and there is concern that the model and the mandated space allowances are inadequate' to ensure acceptable animal welfare on all shipments (Caulfield et al., 2014).

Schipp (2013) noted that ASEL reflected the animal welfare standards of the World Organisation for Animal Health (Office International des Epizooties: OIE),<sup>12</sup> but there are no OIE welfare 'standards', only OIE welfare 'recommendations'. These are not intended as auditable standards or as best practices, but as 'basic minimum standards for developing countries'.<sup>13,14</sup> ASEL standards are inferior to Australian legislation that governs animal welfare standards applying to livestock in Australia (Caulfield, 2009).

As stated by Schipp (2013), under Australian law, exporters are required to comply with ASEL. This is problematic since the exporter is the sole target of the relevant laws, but much of the live export chain lies outside Australia's legal jurisdiction in international waters and overseas countries. The Master of the ship is not accountable under Australian laws for any animal welfare problems, and the animals on board are not owned by the exporter. In addition, proof that the law has been broken requires proof of intention or recklessness to breach ASEL at the legal standard of 'beyond reasonable doubt'. Whilst there is a suite of options that DAFF has at its disposal to use in response to non-compliance with its live export regulatory regime,<sup>15</sup> it seems these are rarely used, even when its investigations into high mortality voyages reveal repeated breaches of ASEL.<sup>16</sup> To our knowledge, DAFF has only acted to suspend or cancel

an export licence on three occasions in the last 11 years (namely, in 2002, 2003 and 2007). There are also few impediments to exporters applying for an export licence under another company name.

ASEL requires that every voyage must have at least one accredited stockperson, with or without an accredited veterinarian (depending on the type of voyage), who are required to monitor and report on animal welfare. However, the stockpersons and veterinarians are directly contracted to the exporter and thus cannot be considered to be independent. It must be questioned whether this policy achieves normally acceptable standards for best practice,<sup>17</sup> especially when there is no requirement for veterinarians in Australia generally or in the live export trade specifically to report breaches of animal welfare legislation to the relevant authorities.

Lack of independent reporting has long been recognised as problematic by veterinarians and animal welfare organisations and has been discussed in government investigations. Concern was raised as far back as 2003 in the Australian Quarantine Inspection Service (AQIS) Compliance and Investigation Program Brief on the 'Investigation into the alleged mis-reporting of sheep mortality figures on board the vessel 'Al Khaleej' between 22nd August 2001 and 7th September 2001 as reported by Tony Hill on '60 Minutes' on 27th July 2003'<sup>18</sup> and also in the Keniry Enquiry (2004).<sup>19</sup> In 2011, the Australian Veterinary Association recommended in a Secondary Submission to the Independent Review into Australia's Livestock Export Trade (2011) 'that employment and allocation of voyages be handled by DAFF in consultation with the veterinarian and exporter. . . . By removing employment of veterinarians from the exporters, it provides an extra level of independence and oversight'.<sup>20</sup>

Unfortunately, industry and government have successfully resisted this change. This is perhaps not surprising given that, of the 16 listed market threats identified by the Western Australian government's 2010 SWOT<sup>21</sup> analysis for the livestock market, six directly or indirectly related to concerns about and politics of welfare issues. These were: (1) aberrant behaviour by exporters – pregnant ewes, cows calving en route, incorrect stock selection; (2) welfare issues in some countries; (3) inappropriate scientific handling of research data; (4) media coverage of domestic issues; (5) impact of sheep ship incidents and Australian policy, and (6) inability of some shippers to meet export standards.<sup>22</sup>

Schipp (2013) reported that 'only healthy and fit animals' are loaded for export from Australia. This is indeed what ASEL stipulates but it must be questioned in the light of the Australian government's review into ASEL, in which one experienced government-accredited live export veterinarian reported commonly observing the loading of animals which should have been rejected from the shipment.<sup>23</sup> Similar observations have been made

<sup>10</sup> See: Live animal trade: the New Zealand experience at: <http://www.abc.net.au/radionational/programs/saturdayextra/live-animal-trade-the-new-zealand-experience/2917316> (accessed 5 December 2013).

<sup>11</sup> See: Analysis of Submissions: New Zealand's requirements for export of livestock for slaughter at: <http://www.biosecurity.govt.nz/files/regs/exports/animals/nz-req-export-livestock-slaughter-subs.pdf> (accessed 7 March 2014).

<sup>12</sup> See: OIE Terrestrial Animal Health Code, Volume 1, Chapter 7, Animal Welfare, 2012. 21st edition, World Organization for Animal Health, Paris, France. [http://www.oie.int/index.php?id=169&L=0&htmfile=titre\\_1.7.htm](http://www.oie.int/index.php?id=169&L=0&htmfile=titre_1.7.htm) (accessed 7 March 2014).

<sup>13</sup> See: Submission by Animals Australia to the Independent Review into Australia's Livestock Export Trade: <http://www.livestockexportreview.gov.au/Submissions%20received/Documents/Animals-Australia.pdf> (accessed 7 March 2014)

<sup>14</sup> See: Melissa Parke MP Live animal export update: <http://www.melissaparke.com.au/speeches/353-live-animal-exports-update.html?&template=melisaparkempprinttemplate> (accessed 7 March 2014)

<sup>15</sup> See: Compliance Measures and Sanctions for Livestock Exports: <http://www.daff.gov.au/biosecurity/export/live-animals/livestock/regulatory-framework/compliance-investigations/compliance-measures-sanctions-livestock-exports> (accessed 7 March 2013)

<sup>16</sup> See: AQIS Mortality Investigation Reports: <http://www.daff.gov.au/WC%2011-4-2013/Imported%20Food%20Inspection%20Data/Markup/?a=208301> (accessed 7 March 2013).

<sup>17</sup> US Department of Health and Human Services, Administration for Children and Families Program Announcement. Federal Register, Vol. 68, no. 131, July 2003.

<sup>18</sup> Documents held by SF.

<sup>19</sup> See: Keniry Livestock Export Review: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0008/146708/keniry\\_review\\_jan\\_04.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0008/146708/keniry_review_jan_04.pdf) (accessed 7 March 2014)

<sup>20</sup> See: Australian Veterinary Association Secondary Submission [http://www.daff.gov.au/livestockexportreview/submission\\_received/ava-supplementary](http://www.daff.gov.au/livestockexportreview/submission_received/ava-supplementary) (accessed 7 March 2014)

<sup>21</sup> SWOT analysis is a structured planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in a business.

<sup>22</sup> Department of Agriculture and Food's Bulletin 4783, The Middle East Western Australia's Exports 2008–09 and Business Development Strategy to 2011–12; February 2010; [http://archive.agric.wa.gov.au/objtwr/imported\\_assets/content/amt/bn\\_middle\\_east\\_to\\_2015.pdf](http://archive.agric.wa.gov.au/objtwr/imported_assets/content/amt/bn_middle_east_to_2015.pdf) (accessed 7 March 2014)

<sup>23</sup> See: Dr Lynn Simpson at: <http://www.daff.gov.au/animal-plant-health/welfare/export-trade/submissions-export-livestock> (accessed and downloaded 2 July 2013 but document now only available on application to DAFF Animal Welfare)

by another accredited veterinarian with respect to a high mortality voyage investigation.<sup>24,25</sup>

Sheep selected for a live export shipment are not necessarily fit and healthy to load. Although ASEL lists anorexia/inappetence as rejection criteria, the inanition/salmonellosis complex has consistently accounted for about 75% of all deaths aboard (Kelly, 1995; Norris, 2005). As reviewed by Phillips and Santurtun (2013), inanition is partly due to failure of sheep to adapt to pellets offered initially in the pre-voyage feedlot, where they spend about 5 days. It has been reported that 2.4%, 5.0% and 32% of sheep in the feedlot did not eat pelleted food after periods of 13 days, 8 days or 3 days, respectively (Norris et al., 1992). Sheep that do not eat in the feedlot will not have eaten for over 5 days by the time they load. Some will start to eat on board but others will die due to inanition itself or salmonellosis (Kelly, 1995; Norris, 2005). There are no requirements to identify 'shy feeders' at the feedlot by using dye in the feed or feed bar markers, thus, inappetent animals are not detected and removed from the system, despite ASEL defining inappetence as a rejection criterion and inanition being identified as a major cause of sheep mortality.

It is also important not to ignore the issue of loading sheep with contagious pustular dermatitis (orf, 'scabby mouth'). This disease, endemic in Australia and often regarded as unimportant despite morbidity that may reach 100% (Higgs et al., 1996), is a rejection criterion in ASEL. However, sheep with scabby mouth are said to be present on all shipments (Higgs et al., 1996; McCarthy, 2012). The pre-voyage feedlot is central to the start of scabby mouth epidemics (Higgs et al., 1996; McCarthy, 2012). Although some infected sheep can be removed during loading of the ship, detection of all but those severely affected is in reality impractical (Higgs et al., 1996). Under these circumstances, it seems optimistic to state that only healthy and fit animals are loaded for export from Australia (Schipf, 2013).

Further, failure to detect orf has had far greater welfare repercussions than the disease itself. On several occasions, importing countries have rejected entire shipments of sheep because the sheep have had scabby mouth. In one instance, the rejection resulted in the ship remaining at sea for 80 days, with the delays blamed for the deaths of 5691 (10%) sheep out of a shipment of 57,937.<sup>26</sup> In a more recent incident (August 2012), Bahrain rejected 22,000 sheep on the grounds of scabby mouth. The sheep were then sent to Pakistan.<sup>27</sup> The Pakistani authorities were not informed that Bahrain had rejected the sheep<sup>28</sup> and an Australian government health certificate was provided for the consignment.<sup>29</sup> Pakistan also rejected the sheep. The exporter then lost control of the supply chain resulting in a cull of

the sheep with non OIE-compliant slaughter<sup>30</sup> described by a director for the exporter as 'a horrific act'.<sup>31,32</sup>

Improved scabby mouth prevention is obviously desirable. A recent publication, commissioned by MLA showed that the vaccination protocol adopted for shipments to Saudi Arabia was extremely successful in reducing scabby mouth at destination (McCarthy, 2012). However, the current infectious vaccine is far from ideal and until effective, non-infectious vaccines are available, the industry is unlikely to embrace widespread vaccination. Interestingly, McCarthy (2012) also demonstrated that there was a low prevalence of orf in sheep sourced from the eastern states of Australia (where vaccination is not routinely practised), due to the ability to empty the assembly facilities between consignments and the absence of sheds that might harbour the disease. McCarthy (2012) concluded that adopting an exclusion policy, coupled with a rigorous inspection system at the point of receipt, could be an effective disease management strategy until such time as an improved vaccine is available. It is to be hoped that the industry adopts this recommendation.

In 2011, the Australian Government commissioned an Independent Review of Australia's Livestock Export Trade. The review recommended that the current inspection regime from Fremantle Port (Australia's major export port) be reviewed and that a comprehensive review of ASEL be undertaken.<sup>33</sup> The recommendations of the Fremantle Port Review (released in December 2012)<sup>34</sup> and their acceptance in most part by the Australian Government provided strong evidence that the inspection system at Australia's major sheep export port was not operating effectively. The impact of this recognition is very significant, when one considers that the majority of approximately 32 million Australian sheep exported in the last 10 years have been exported from Fremantle Port (Norris and Gorman, 2013). DAFF has recently issued an Export Advisory Notice (EAN)<sup>35</sup> clarifying procedures for dealing with livestock rejections from 1 November 2013. It includes identification, isolation, prompt treatment or humane euthanasia and records of each rejection. The fact that such an EAN is even necessary is telling and indicates a picture, at least up until 1 November 2013, rather different to that portrayed by Schipf (2013).

Schipf (2013) advises that 'ASEL is based on verifiable standard animal welfare parameters' including minimum provision requirements and space allocation, yet the stocking densities for sheep and cattle are higher than stocking densities in Australian animal welfare codes of practice regulating animal confinement in cattle feedlots, sale yards and intensive indoor systems (Caulfield et al., 2014). Phillips and Santurtun (2013) remark that there is no empirical basis for stocking densities on ships, even though this is a key factor determining the health and welfare of animals. The minimum pen area

<sup>24</sup> See: End of Voyage Report at: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0003/2185932/end-of-voyage-report.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0003/2185932/end-of-voyage-report.pdf) (accessed 7 March 2014).

<sup>25</sup> See: Investigation into the reportable cattle deaths on a sea voyage from Portland Victoria and Fremantle Western Australia to Turkey, June–July 2011 at: <http://www.daff.gov.au/biosecurity/export/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-mortalities/report-39> (accessed 7 March 2014)

<sup>26</sup> See Keniry Livestock Export Review at: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0008/146708/keniry\\_review\\_jan\\_04.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0008/146708/keniry_review_jan_04.pdf) (accessed 7 March 2014)

<sup>27</sup> See Report into Wellard Rural Export consignment of sheep exported to Pakistan: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0009/2309607/report-into-wellard-rural-export-consignment-of-sheep-exported-to-pakistan.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0009/2309607/report-into-wellard-rural-export-consignment-of-sheep-exported-to-pakistan.pdf) (Accessed 7 March 2014)

<sup>28</sup> See Another Bloody Business: <http://www.abc.net.au/4corners/stories/2012/11/02/3623727.htm> (accessed 7 March 2014)

<sup>29</sup> See Report into Wellard Rural Export consignment of sheep exported to Pakistan: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0009/2309607/report-into-wellard-rural-export-consignment-of-sheep-exported-to-pakistan.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0009/2309607/report-into-wellard-rural-export-consignment-of-sheep-exported-to-pakistan.pdf) (Accessed 7 March 2014)

<sup>30</sup> See Report into Wellard Rural Export consignment of sheep exported to Pakistan: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0009/2309607/report-into-wellard-rural-export-consignment-of-sheep-exported-to-pakistan.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0009/2309607/report-into-wellard-rural-export-consignment-of-sheep-exported-to-pakistan.pdf) (Accessed 7 March 2014)

<sup>31</sup> See Brutal sheep slaughter puts Pakistan live export in doubt: <http://www.abc.net.au/am/content/2012/s3599593.htm> (Accessed 7 March 2014)

<sup>32</sup> See Another Bloody Business: <http://www.abc.net.au/4corners/stories/2012/11/02/3623727.htm> (Accessed 7 March 2014)

<sup>33</sup> See The report of the independent review into Australia's livestock export trade: [http://www.daff.gov.au/livestockexportreview/the\\_report\\_of\\_the\\_independent\\_review\\_into\\_australias\\_livestock\\_export\\_trade](http://www.daff.gov.au/livestockexportreview/the_report_of_the_independent_review_into_australias_livestock_export_trade) (Accessed 7 March 2013)

<sup>34</sup> See Final Report of the Review of the Inspection Regime prior to export from Fremantle Port: [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0010/2272978/Review\\_of\\_the\\_inspection\\_regime\\_prior\\_to\\_export\\_of\\_livestock\\_from\\_Fremantle\\_Port\\_report.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0010/2272978/Review_of_the_inspection_regime_prior_to_export_of_livestock_from_Fremantle_Port_report.pdf) (accessed 7 March 2014)

<sup>35</sup> See Export Advisory Notice – 2013/09 Clarifying procedures for dealing with livestock rejected prior to transport to the port/airport and at the port/airport of loading [http://www.daff.gov.au/\\_data/assets/pdf\\_file/0008/2349152/ean2013-09.pdf](http://www.daff.gov.au/_data/assets/pdf_file/0008/2349152/ean2013-09.pdf) (accessed 7 March 2014)



for a 47 kg sheep is 0.308 m<sup>2</sup> on a live export sheep under ASEL, but the minimum for a 47 kg sheep in intensive housing using allometric relationships that would allow adequate access to food and water is 0.42 m<sup>2</sup> (0.033× bodyweight<sup>0.66</sup>) (Petherick and Phillips, 2009), which is 36% higher. To the best of our knowledge, the allowable stocking densities on board live export ships, as designated by ASEL, have no scientific basis and have never been subject to the detailed measurements, data collection and analysis that are the mainstay of the accepted scientific practice of welfare determination.

It has also been stated that ASEL includes 'specific animal welfare indicators other than mortality' (Schipp, 2013). This is correct, but it is our understanding that mortality is currently the only measure of animal welfare that is investigated or reported. Broom (2003) suggests that the welfare of animals during transport should be assessed using a range of behavioural, physiological and carcass quality measures in addition to documenting the extent of any disease, injury or mortality resulting from, or exacerbated by, transport. Measures of welfare status that are routinely employed (but absent from live export voyages) include assessment of heart rate, respiratory rate, body temperature, feed and water intake and urine output (Beatty et al., 2006; Stockman et al., 2011), behaviour (Barnett and Hemsworth, 1990), physiological measures such as haematocrit, white cell count, red cell count, neutrophil: lymphocyte ratio,  $\gamma$  interferon production, blood glucose, cortisol and haptoglobin concentrations, blood creatine kinase activity (Earley et al., 2012), and environmental assays including those for air exchange/speed, temperature, humidity and ammonia levels (Pines and Phillips, 2011).

We do not accept that weight gain alone can be used as an indicator of good welfare. Weight gain is interpretable only in the light of clinical, physiological and environmental measures, the time frame over which the assessments are determined, and the body mass composition of the animals. Weight gain itself is not necessarily a measure of good or even improved production animal welfare states (Alvarez et al., 2013). Animals which are closely confined with little movement possible and with restricted normal behaviours apart from eating and drinking can often gain weight regardless of their welfare state as shown by Vas et al. (2013) in goats. Dr Temple Grandin<sup>36</sup> has stated that 'Livestock producers routinely measure weight gain, death losses and sickness but they may not be measuring painful or distressing conditions such as lameness, bruises or electric-goat use which severely compromises an animal's welfare'. Grandin also observed that 'People often fail to be effective managers of conditions that they do not measure'.<sup>37</sup>

As such, Australia's live export trade is a concern as there is a scarcity of measurements and consequently of data in this trade. Welfare during land transport in many species (including fish) has been subject to increased scrutiny in recent years (King, 2009; Jones et al., 2010; Minka and Ayo, 2010, 2013; Nielsen et al., 2011; Padalino et al., 2012; Tateo et al., 2012), but welfare in sea transport is still to be comprehensively addressed in independent peer-reviewed studies. The recent reviews by both Phillips and Santurtun (2013) and Caulfield et al. (2014) both highlight this paucity of data and scientific analysis, with the Caulfield study also indicating significant difficulties in accessing Australian data due to commercial interests.

Experienced live export veterinarian Dr Lynn Simpson wrote in her submission to the government review of ASEL that 'these voyages are not all short and clean as depicted by industry and their public relations machine' and 'export . . . is being done primarily to commercial advantage and not in general prioritising the well-being and health

of the animals'.<sup>38</sup> Such statements, and the photographs included in the report, are in contrast to the image of the Australian government as one that cares about animals in a stringently regulated trade. It is noteworthy that the submission is now available only on application as 'DAFF made the decision to remove the submissions for direct download because of the images included in some of the submissions. In particular, images of animal cruelty that may cause distress to some people, especially children, who may access information from our website'.<sup>39</sup>

Schipp (2013) must be acknowledged for outlining the Australian Government's views on the welfare of Australia's livestock transported by sea and the improvements being made by the industry and Government in this area. However, until historic and ongoing welfare problems such as heat stress, ovine inanition/salmonellosis complex and scabby mouth are rigorously addressed and there are penalties imposed for breaching ASEL, many will continue to have concerns for the welfare of Australian animals exported by sea. We also remain concerned that key elements of ASEL, including the heat stress model, stocking density and reportable mortality limits are not underpinned by data from independent peer-reviewed scientific research. It is our hope that the Australian government will recognise that arbitrarily defined mortality limits and weight gain in livestock are not adequate measures of animal welfare by themselves and that published scientific studies are required. When science is involved, one should not be able to accomplish by fiat what one cannot accomplish with data.

#### Conflict of interest statement

Both authors are members of Vets Against Live Export (VALE).

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<sup>36</sup> See Improving Animal Welfare, A Practical Approach <http://www.grandin.com/inc/improving.animal.welfare.ch1.html> (accessed 7 March 2014)

<sup>37</sup> See Improving Animal Welfare, A Practical Approach <http://www.grandin.com/inc/improving.animal.welfare.ch1.html> (accessed 7 March 2014)

<sup>38</sup> See Dr Lynn Simpson at: <http://www.daff.gov.au/animal-plant-health/welfare/export-trade/submissions-export-livestock> (accessed and downloaded 2 July 2013 but document now only available on application to DAFF Animal Welfare)

<sup>39</sup> DAFF letter to B. Jones, RSPCA, Australia (B. Jones, personal communication).

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