



Australian Government
Department of Agriculture

Review of the Australian Standards for the Export of Livestock: Air Transport

Final report

Technical Advisory Committee

September 2019



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Summary

The Australian Standards for the Export of Livestock (ASEL) set requirements to ensure animals are fit to export from Australia, and their health and welfare is managed throughout the export journey. The current standards, v2.3, have been in place since 2011. The purpose of this review is to ensure the standards remain fit for purpose and reflect the latest science.

The Technical Advisory Committee consulted widely in forming its views. It also considered the findings of a literature review commissioned by the Department of Agriculture. On the basis of information received, and its own analysis, the committee has recommended a number of changes to the standards to help ensure the welfare of animals exported by air. They include changes in relation to:

- sourcing and preparation of livestock—with controls to remain on sourcing certain livestock and management plans required for livestock that require specialised care
- on board management—including stocking density and attendants
- reporting requirements and mortality levels.

The recommendations were formed based on welfare considerations. But, as required by the committee's terms of reference, the practicalities of livestock management and industry sustainability were also considered. The committee's analysis of financial implications is provided in this report. There will be costs, and they will need to be shared between exporters, producers, and ideally, the end consumer.

The committee is mindful that the current standards are predominately input based, rather than outcomes based. This approach assumes that if the inputs are controlled, then a satisfactory animal welfare outcome will follow. The committee also notes that, while best practice is to focus on the outcomes desired, there still needs to be a minimum set of standards that clearly articulate what society expects all exporters to meet. The committee's recommendations have been made with this risk/debate in mind.

Recommendations

Sourcing and preparation

- 1) That the minimum weight of alpacas sourced for export by air be raised to 20kg.
- 2) That the standards require a management plan for the sourcing and export of deer under 6 months of age. The management plan must address potential risks during transport including particular arrangements for the transport of young deer, management of young deer during delays, access to water, rest periods and any additional space requirements.
- 3) That the standards require a management plan for the sourcing and export of miniature breeds and other livestock that do not meet the minimum liveweight requirements. The management plan must address potential risks associated with such young or light weight livestock during transport including their management during delays, access to water, rest periods and any additional space requirements.

- 4) That the body condition score tables for beef and dairy cattle, buffalo, sheep, goats, camels and alpacas included in [Appendix A](#) be adopted for air transport.
- 5) That the standards (S6.15) be amended to prevent male deer being sourced for export by air unless they have hard antlers removed leaving only buttons, they are not in the first 2 weeks after velveting and they are outside the roar and rut periods if they are over 1 year of age.
- 6) That the rejection criteria in the standards be amended to prevent deer being exported that have broken velvet.
- 7) That the pregnancy testing requirements detailed in [Appendix B](#) be adopted for livestock exported by air.
- 8) That the standards require a management plan for livestock exported in the last third of pregnancy. The management plan must address potential risks during transport including the management of livestock during delays, access to water, rest periods and any additional space requirements.
- 9) That standards 6.13 (goats) and 6.14 (deer) be amended to: require that non-farmed goats and deer must not be sourced for export unless they have become conditioned to being handled and to eating and drinking from troughs for a minimum of 21 days at some time before being sourced for export.
- 10) That the standards include a requirement for non-farmed buffalo to have become conditioned to being handled and to eating and drinking from troughs for a minimum of 21 days.
- 11) That the standards require a management plan for livestock that are exported with young at foot. This plan must address possible risks during transport including the management of livestock during delays, access to water, rest periods and any additional space requirements.
- 12) That the standards prevent livestock that have given birth in the 5 days prior to the expected date of departure of the aircraft, from being exported.
- 13) That the requirements for horned cattle, buffalo and sheep outlined in [Section 2.6.3](#) of this report be adopted for air transport. That is
 - a) for cattle, tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end
 - b) for buffalo, if the horns are no longer than the spread of the ears
 - c) for sheep, are no longer than 1 full curl
- 14) That the standards (ASEL v2.3, S6.12) for sourcing horned goats for export by air be amended in line with the Land Transport Standards: Horn trimming or removing sharp horn points is recommended to minimise injury to other goats. Where tipping is applied for bucks, horns should be tipped within 2.5-5cm from the tip (no further down than 2cm diameter of horn) and for does less than 2cm from tip to avoid sensitive zones. Tipping, where applied, should be done at least 7 days before transport.

- 15) That the standards require a minimum 24 hour rest period for any livestock that have been returned to an approved premises or alternative property after being transported to the airport, and prior to being reloaded for transport back to the airport.

Stocking density

- 16) That the space allowances in [Appendix C](#) be adopted for alpacas (this table is based on the Land Transport Standards space allowances).
- 17) That the standards require camels over 300kg liveweight to be penned for air transport in accordance with a management plan.
- 18) That the standards require livestock to be penned for air transport with animals of the same species, class, gender and of a similar weight (note: castrated males may be penned with females however entire males must be penned separately). Animals must be crated with similar weighted and sized animals or the crate must be divided so that animals of unequal size are penned separately.
- 19) That the current wording in 6.1.1 (2)(b) be changed to – “that when calculating the stocking density per pen, the number of livestock per pen may be rounded to the nearest whole number. n.7 (and below) must be rounded down.”

Livestock management

- 20) That a management plan for water deprivation time during the whole journey be required for all livestock consignments by air. This plan should address the time livestock are off water and include water management arrangements during delays and transit stops, aimed at ensuring maximum water deprivation times are not exceeded.
- 21) That the maximum water deprivation times reflected in the Land Transport Standards be adopted as detailed in [Appendix D](#).
- 22) The exporter must ensure a competent attendant is present during planned transit stops and unloading of livestock from the aircraft to oversee the welfare of the animals.
- 23) That the standards require a competent attendant appointed by the exporter(s) accompany consignments where the livestock are transported:
 - a) on all charter aircraft dedicated to livestock; and
 - b) on a freighter aircraft unless otherwise agreed by the relevant government authority.The role of the attendant is to oversee the welfare of the livestock during flight, at transit stops and during unloading of livestock from the aircraft.
- 24) That standard 6.22 is amended to 'Livestock for export by air must be checked to ensure they remain fit to travel:
 - a) immediately before departure
 - b) where feasible
 - i) within 30 to 60 minutes of commencement of the flight
 - ii) at least every 2 to 3 hours during the flight
 - iii) as soon as possible after landing

- c) immediately prior to departure during any transit stops'

Facilities

- 25) The department should work with the relevant organisation(s) to review and improve the facilities available at airports for the unloading of livestock from land transport, inspection and loading into crates and loading onto the aircraft, to ensure they meet the standards expected to mitigate risks associated with animal health and welfare.

Reporting

- 26) That the reportable level for mortalities for sheep, goats, camelids and deer should be set at 1%, or 3 animals, whichever is greater.
- 27) That the reportable level for mortalities for cattle and buffalo should be set at 0.5%, or 3 animals, whichever is greater.
- 28) That the question of mortality reporting be examined by the department in consultation with industry, in an attempt to cover the whole period that the animals are held in air export crates.
- 29) That the standards require that each shipment has a contingency plan for the management of livestock in the event the aircraft is diverted and forced to land at a location different from the intended transit stop(s) or destination. An exporter's contingency plan must demonstrate how a suitable person will attend unplanned stops to oversee the welfare of the animals.
- 30) That the standards require a contingency plan for euthanasia for any animal where it is deemed as required either on-board the aircraft if livestock are accessible and it is safe to do so, or as soon as possible after unloading the livestock from the aircraft.
- 31) That the requirements for the end of journey report be updated as per [Appendix E](#) of this report to include more detailed animal welfare and environmental monitoring and to cover more aspects of the air export journey.
- 32) That the standards include a notifiable incident if the maximum water deprivation time is exceeded. If maximum water deprivation times are exceeded, exporters should notify the department as soon as possible. The report should include details of any mitigating measures that have been employed to address the issue.

General

- 33) That the standards include a provision that the IATA Regulations, as amended and in force from time to time, shall apply to the export of livestock by air from Australia, unless there is a variance with the ASEL, in which case the ASEL should apply.
- 34) That the department releases an Export Advisory Notice when the IATA Regulations are amended.

1 Introduction

1.1 Australian Standards for the Export of Livestock

The first Australian Livestock Export Standards were developed in 1996–97 by industry. These were in place from 1998 until 2005, when the first version of the Australian Standards for the Export of Livestock (ASEL) were released, following a recommendation made by Dr John Keniry in his 2003 review of the live export trade. Since that time, the ASEL has set the animal welfare standards for the export of livestock from Australia by sea and by air.

The ASEL is given effect under the *Australian Meat and Live-stock Industry (Standards) Order 2005*, and is referenced in instruments including the *Export Control (Animals) Order 2004*. Exporters must comply with the ASEL to be permitted to export livestock by the Department of Agriculture.

Four versions of the ASEL have followed since 2005, with the current version, ASEL v2.3, in place since 2011. It covers the major steps along the livestock export supply chain, including:

- sourcing and on-farm preparation of livestock
- land transport of livestock for export
- management of livestock at registered premises
- vessel preparation and loading
- on-board management of livestock
- air transport of livestock.

The standard applies to exports of cattle, sheep, goats, buffalo, deer and camelids.

1.2 Review of the ASEL

The last significant review of the ASEL was undertaken in 2012–13, following the Independent Review of Australia's Live Export Trade conducted by Mr Bill Farmer AO (the Farmer Review). The review was undertaken by a steering committee made up of representatives from state and territory governments and animal welfare, veterinary, livestock producer and industry representative organisations. The steering committee provided its final report in May 2013, recommending improvements to both the content and format of the standards and providing an incomplete draft version of the standards. There were 13 unresolved issues and the draft standards were not implemented.

In 2017, the government announced the current review process to ensure the standards remained fit for purpose and continue to be supported by the latest scientific research. A Technical Advisory Committee was appointed to undertake the review process. The committee's handbook describing its role and operation is available on the department's website.

In summary, the committee's role is to:

- make recommendations to the department aimed at ensuring all livestock that enter the supply chain are fit for export and maintain their health and welfare status throughout the export journey
- carry out the review to facilitate the continuous improvement of the standards, considering new animal welfare research and innovations in industry practices in a timely manner
- 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
- ensure the recommendations align with the guiding principles of the committee.

To achieve these objectives, the committee is to:

- conduct public submissions processes to ensure all interested stakeholders have the opportunity to provide input to the standards
- ensure all technical issues, new research and scientific knowledge submitted by stakeholders relating to ASEL are properly considered and independent expert advice sought as necessary
- examine a range of viable, genuine, policy options
- clearly analyse the benefits and costs of the proposed options for affected stakeholders in a balanced and objective manner, with particular regard to the practicalities of livestock management and implications for animal welfare in Australia.

In 2018, the committee undertook a review of the standards relating to livestock exported by sea. The committee's final report on livestock exported by sea was released on 19 March 2019. The committee made 49 recommendations that addressed different parts of the standards; from sourcing and preparation, through to the management of livestock on-board vessels. The department accepted all the recommendations in full or in-principle. The implementation of the committee's recommendations will be done in 2 stages, with recommendations relating to on-board space allowances implemented as a priority, and the remaining recommendations to be implemented by early 2020.

The review of the standards for livestock exported by air formally commenced in March 2019. Members of the committee attended Melbourne airport to observe 2 consignments being loaded for export, 1 of goats and 1 of cattle, to better inform themselves of the air export process. The committee observed the procedures at the airport including the unloading of trucks, inspection of livestock, crating of livestock and the loading of the aircraft as well as the facilities available at the airport.

On 11 April 2019, the committee released the review of the ASEL: Air Transport Issues Paper seeking comment on the key areas of contention for livestock prepared for and exported by air. The consultation period closed on 16 May 2019 and 12 submissions were received. The committee considered views outlined in submissions and the findings of an independent literature review commissioned for the review process, to form draft recommendations for improving the standards. The draft recommendations were released for further consultation and testing on 20 June 2019 and 12 submissions were received.

The committee engaged with a Stakeholder Reference Group (the reference group) during the review. The reference group provided a resource to discuss technical and practical aspects of the review informed by their members' extensive experience. More detail on the reference group and the consultation process is provided at [Appendix F](#) of this report.

Table 1 ASEL review process to date

Date	Activity
27 July 2017	Commitment to undertake review, call for committee members.
6 February 2018	Stage 1 Issues Paper released, including draft reformatted standard.
20 March 2018	Submissions closed—19 submissions received.
17 May 2018	McCarthy Review report released.
24 May 2018	Then Minister for Agriculture and Water Resources, the Hon. David Littleproud MP, announced that the timeline for ASEL review would be accelerated.
23 August 2018	Issues Paper: Sea Transport released for consultation. Stage 1 report released.
19 September 2018	Submissions closed—41 submissions received.
31 October 2018	Draft report: sea transport and standards released.
27 November 2018	Submissions closed—276 submissions received. ^a
14 December 2018	Final report: sea transport handed to the department.
19 March 2019	Final report: sea transport and department response released.
11 April 2019	Issues Paper: Air Transport released for consultation.
16 May 2019	Submissions closed—12 submissions received.
20 June 2019	Draft report: air transport released for consultation
18 July 2019	Submissions closed – 12 submissions received.

^a The RSPCA also separately collected 6,623 community submissions on the draft report.

1.3 Out of scope

As noted in [Section 1.2](#), the current stage of the review is focussed on the export of livestock by air. Matters relating to export by sea were considered in 2018. The committee's terms of reference also excludes the following matters:

- expanding the scope of the standards within the supply chain
- assessing other livestock export licencing and regulatory arrangements such as approved arrangements and the Exporter Supply Chain Assurance System (ESCAS)
- examining legislation enabling livestock exports, with the view to amending it
- reviewing the Australian Position Statement on the Export of Livestock which is located at the front of the ASEL v2.3
- assessing the implementation and compliance by individual exporters
- commenting on the suitability of domestic animal welfare standards for livestock
- seeking endorsement of recommendations after providing them to the department, or drafting final orders
- considering the framework by which Australian Government Accredited Veterinarians (AAVs) or accredited stockpersons are engaged.

1.4 This report

The committee has adopted the principle that national minimum standards should ensure consistent welfare outcomes and provide industry participants with clear criteria for meeting their duty of care to the animals they manage along the export supply chain. The standards must, to the maximum extent possible, be evidence-based and, where available, supported by contemporary science relevant to Australian systems and the conditions faced during the journey from Australia. They also need to be enforceable. As required by the terms of reference, the committee has sought to balance implications for livestock welfare with the practicalities of livestock management, compliance costs and industry sustainability.

This report is structured around key areas of debate in relation to the standards. For each issue, the report notes relevant parts of the standards, summarises the debate in submissions and outlines the committee's deliberations. A recommendation for changing the standards is then provided.

In addition to considering submissions, the committee drew on a literature review that was commissioned by the department to assist with the review process. The review considered existing science relating to the health and welfare of livestock exported by air. The review was commissioned via a procurement process in a limited time frame to cover literature relevant to the Australian context, including peer-reviewed papers, non-peer reviewed industry reports, conference papers and other procedural documents.

Where there were no contemporary or directly relevant scientific studies, the committee formed its views based on the available information and its own assessments.

1.5 Regulatory approach and monitoring

The committee is mindful that the current standards are predominately input based, rather than outcomes based. This approach assumes that if the inputs are controlled, then a satisfactory animal welfare outcome will follow. The committee also notes that, while best practice is to focus on the outcomes desired, there still needs to be a minimum set of standards that clearly articulate what society expects all exporters to meet. Notwithstanding that, the committee believes there should be scope for the department to reward superior performance based on demonstrated outcomes. If the recommendations of this report are adopted, the department will have increased amounts of data with which to identify operators who consistently achieve better welfare outcomes including low mortality and other reportable incidents. Continuous improvement and innovation should be encouraged, not discouraged by limiting operators to only the specific methods as detailed in the standard. Future reviews should consider options to further adopt an outcomes based approach.

The committee welcomes the department's commitment to conduct regular consultative reviews of the standards based on science, evidence and international practice. This decision follows the recommendations of the recent review of the regulatory capability and culture of the department in regulating live animal exports (the Moss Review). The matters identified in this report should be built into those review processes, adopting a continuous improvement approach. They include:

- management plans for livestock that do not meet the minimum standards, such as miniature breeds

- pregnancy testing requirements (who may undertake pregnancy testing) once national standards are developed
- management plans for livestock in the last third of pregnancy
- management plans for livestock exported with young at foot
- the welfare impact of having an attendant travel with livestock
- the reportable mortality level and the equivalence between reportable mortality levels for sea and air transport
- undertaking an epidemiological approach to analysing reports (for example, end of journey reports).

1.6 The standards

During the ASEL: Sea Transport review, the committee proposed a reformatted version of the standards. It incorporated the committee's final recommendations and other administrative changes. The department elected to delay the implementation of a reformatted ASEL until after the air transport review has been completed. In the interim, the department is undertaking further consultation with ASEL users to determine what format and features are most beneficial to everyday users of the ASEL. This consultation will help to inform the final decision on a reformatted ASEL.

1.7 Background on the livestock air transport industry

Air transport is an important method of export for Australian livestock. Air transport accounts for a small percentage of the number of livestock exported from Australia, when compared with sea transport, as seen in Table 2. During the 3 years from 2016–18, 2.8% of sheep, 0.86% of cattle and 0.04% of buffalo were exported by air. During this time, all goats, camels, deer and alpacas exported from Australia were exported by air.

Despite the comparatively low numbers of livestock exported by air, it retains a valuable place in the export industry as a method for exporting high value livestock, particularly breeding livestock, and smaller consignments. In 2016–18, 2.43% of slaughter and feeder sheep were exported by air, highlighting that for some markets air transport is a viable and competitive option.

There are a number of Australian and international regulations and standards that apply to the export of livestock by air transport including the ASEL, the International Air Transport Association Live Animals Regulations (IATA Regulations), the World Organisation for Animal Health Terrestrial Animal Health Code (OIE Code), and the Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock (Land Transport Standards).

The IATA Regulations are the worldwide standards for the transport of live animals by air on commercial airlines. There are currently 290 airlines from 120 countries that are members of IATA and have adopted its standards, including Qantas and Virgin Australia.

The standards are designed to ensure the safety and welfare of animals transported while also ensuring consistency with commercial aircraft regulation and human safety. The IATA Regulations are reviewed twice a year and the updated standards are published once a year. The IATA Regulations include container specifications, stocking rates, labelling for different species

and classes of animals, animal and container handling requirements as well as required documentation for air transport of live animals.

The OIE Code is the international standard setting code for animal health and welfare. The standards have been adopted by its 182 member countries, including Australia. The code is an extensive document covering animal diseases from diagnosis and notification to prevention and control, risk analysis, trade measures, import and export procedures, veterinary services, and animal welfare.

Chapter 7.4 of the OIE Code specifies the standards for transport of animals by air. The OIE Code outlines requirements on a species by species basis including appropriate container design and ventilation, species specific requirements, space allowances, preparation of animals for air transport, tranquilization and euthanasia of animals, emergency planning, food and waste handling and disposal, and disinfection and disinfestation procedures and requirements.

The Land Transport Standards were developed by the Australian Federal Government in consultation with the State and Territory Governments, the livestock industry, animal welfare organisations and the general public to provide high welfare standards for the land transport of livestock. The Land Transport Standards play a very large and important role in air exports as the land transport component, from the registered or approved premises to the airport, can be a large portion of the total journey time experienced on an air export journey.

The Land Transport Standards apply to all parties involved in the land transport of livestock within Australia and define the requirements for livestock handling, transport vehicles and facilities, pre-transport selection of livestock, space allowances, loading and unloading of livestock, feed, water and rest requirements, contingency planning, and humane destruction (euthanasia).

In reviewing the ASEL, the requirements set out by the IATA Regulations, OIE Code and Land Transport Standards have been considered by the committee. The committee noted that the Land Transport Standards align closely with the Air Standards, particularly with regard to space allowance.

Table 2 Livestock exported by air and sea in 2016 to 2018

Year	Category	Cattle by sea	Cattle by air	Sheep by sea	Sheep by air	Buffalo by sea	Buffalo by air	Goats by air	Alpacas by air	Deer by air	Camels by air
2016	Slaughter and feeder	1,004,595	655	1,774,958	50,875	5,792	0	48,349	0	0	0
	Breeder	131,757	5,452	363	11,831	0	0	5,852	243	80	61
	Subtotal exported	1,136,352	6,107	1,775,321	62,706	5,792	0	54,201	243	80	61
	Mortalities	1,546	0	14,240	10	23	0	22	0	0	0
2017	Slaughter and feeder	97,365	36	1,845,272	38,275	9,585	0	7,072	0	0	0
	Breeder	760,430	9,225	0	3,869	125	0	5,173	1,801	0	67
	Subtotal exported	857,795	9,261	1,845,272	42,144	9,710	0	12,245	1,801	0	67
	Mortalities	888	0	13,517	16	40	0	2	0	0	0
2018	Slaughter and feeder	996,913	221	1,127,431	29,315	8,872	0	12,398	0	0	0
	Breeder	115,864	11,425	16,077	3,966	0	10	9,508	870	0	4
	Subtotal exported	1,112,777	11,646	1,143,508	33,281	8,872	10	20,725	870	0	4
	Mortalities	1,326	0	5,202	4	30	0	2	0	0	0
2016-18	Total exported	3,106,924	27,014	4,764,101	138,131	24,384	10	88,352	2,914	80	132
	Total mortalities	3,760	0	32,959	30	93	0	26	0	0	0

2 Sourcing and preparation of livestock

The way in which livestock are sourced and prepared for export has a significant impact on health and welfare outcomes during the air export journey. Several sourcing and preparation issues were identified by the committee for consideration. These are discussed further in this chapter.

2.1 Liveweight and body condition score for livestock exported by air

2.1.1 Current requirements

While there are minimum weight requirements for exports of the common livestock breeds, currently there are no provisions for special breeds within the standards, such as miniature breeds, that may not meet the minimum weight requirement but are otherwise fit for export.

The rejection criteria for air export requires that any livestock showing systemic conditions such as emaciated or over-fat must not be prepared for export. However, these terms are not defined.

Table 3 Summary of minimum weight requirements in ASEL v2.3

Species	Minimum weight for sourcing livestock
Cattle	150kg
Buffalo	na
Goats	More than 14kg
Sheep	More than 20kg
Alpacas	More than 12kg and are 3 months old
Camels	na

na Not applicable.

2.1.2 Discussion in submissions and literature review

Liveweight and body condition scores were discussed in a number of submissions. While some submissions supported increasing the minimum liveweight for sheep and goats, the current requirements were generally accepted. One submitter suggested that the minimum liveweight for boar goats should be increased to 20kg, as an 18kg boar goat is a young goat. Another submission raised issue with the minimum liveweight and age for alpacas. It was suggested the minimum liveweight should be raised to 20kg or 3 months of age, citing that alpacas of 3 months that are less than 20kg are suffering ill thrift. Another submission called for the minimum period between weaning of lambs and sourcing for export be increased from 2 weeks to 3 weeks. Most agreed that any risks to younger or light weight animals could be handled through a management plan.

It was raised in submissions that the Land Transport Standards, IATA Regulations and OIE Code do not impose prohibitions on the transport of cattle, sheep and goats by air based on weight or age. While light animals may require a higher standard of care, some submitters were of the

view that blanket prohibitions on transporting animals with certain characteristics should only be imposed when it is concluded that available risk mitigation procedures will not prevent poor welfare outcomes.

There was suggestion by some stakeholders that the minimum liveweight for cattle be increased by 20kg. However, there was a general call in submissions for more research to be conducted before commenting on weight restrictions for other species.

Many submitters supported a management plan for miniature breeds. However, 1 submitter recommended that while a management plan is acceptable for miniature breeds, it should not apply to non-miniature breed livestock that do not meet minimum weight requirements as these stock are unsuitable for export even with special management conditions imposed.

Consistency in the wording of minimum liveweights was called for in 1 submission. All weights should be given as the minimum accepted value (minimum liveweight = x kg) or required as over a given weight (liveweight = >x kg).

Most submissions supported the adoption of the body score condition tables recommended in the ASEL: Sea Transport final report and commented that these tables should be consistent throughout the ASEL. One submission called for body condition score tables to be consistent with the national systems and reference the source.

The literature review noted anecdotal evidence that the minimum weight of livestock is not the critical factor, but that stock must be crated appropriately, with similar sized animals kept together and animals of different weights separated.

The research referenced in the literature review is mainly focused on the relationship between body condition scores and productivity (Kenyon et al. (2014)), which highlights that low body condition score can have negative implications on both production and welfare. Further, Kenyon et al. (2014) state that the relationship between body condition score and production capacity, although generally positive is not always linear. Therefore, simply suggesting that a higher body condition score means better animal welfare (in terms of health, production and reproduction) may not be correct.

2.1.3 Committee views

General views were expressed in a number of submissions that younger animals are more vulnerable to stress during air transport. The committee noted that both sheep and goats of 20kg to 24kg and 14kg to 18kg respectively, could be particularly small or young.

The committee also noted concerns raised in 1 submission about the minimum age and weight of alpacas sourced for export by air. The submission indicated alpacas should be at least 20kg by the time they are 3 months of age, and those that were not could be considered ill thrift or failing to thrive. This point was again put forward during consultation with the Stakeholder Reference Group, where some members of the reference group suggested that the minimum weight should be raised to at least 15kg.

The committee agrees that young and light weight animals are at increased risk when exported. The committee therefore came to the view that the minimum weight of alpacas should be increased to 20kg, based on the feedback received from industry and assessment of alpaca growth charts. The committee recognised the importance that young and light weight animals be

given a high standard of care during transport, including only being transported with animals of the same species and of a similar weight (see [Recommendation 18](#)). The committee also considers additional risks to young animals could be managed via the application of management plans.

The minimum weight requirements in [Section 2.1.1](#) cover most livestock, except for deer. The standards do not include a minimum weight requirement for deer. The committee is of the view that deer under 6 months of age should only be exported by air with a management plan.

The committee also considered the minimum weight allowances for other species, including boutique consignments that may not conform to standard characteristics such as miniature breeds. The committee concluded that the current minimum weight requirements for sourcing livestock for air transport are adequate. However, the characteristics of miniature breeds, and other livestock that, for various reasons, do not meet the standard requirements, means they may be unreasonably excluded from export due to not meeting the minimum weight ranges in the standards. Therefore, the committee agreed that a management plan, approved by the relevant government authority, should be required to set out special arrangements to manage the sourcing, preparation and transport of these animals should there be an intention to export them.

A number of submissions suggested that including a recommendation of this nature may allow standard breeds of livestock who fail to meet the minimum weights for their species to be exported. Whilst this seems a reasonable concern on 1 level, the committee believes there should be discretion available to consider consignments of this nature given the scope to make special arrangements for small air shipments, and acknowledges the department's role in approving management plans prior to export. However, the committee recommends monitoring the use of such management plans, with the possible need for limiting exports of this nature considered in the future.

The committee noted the absence of body condition score tables in the ASEL standard 6 for air transport and industry concerns that were raised during the ASEL: Sea Transport review regarding body condition score tables. The committee saw the benefit of consistency in applying the body condition score tables recommended in the ASEL: Sea Transport final report. They are based on scoring tables recommended by livestock industry bodies and widely in use. The committee received a new sheep body condition score table (that differs from that recommended in the ASEL: Sea Transport final report) during consultation of the air issues paper, which has been included in [Appendix A](#). The committee agreed that the body condition score tables, included in [Appendix A](#) of this report, should be adopted for air transport.

Recommendations

- 1) That the minimum weight of alpacas sourced for export by air be raised to 20kg. This plan should address the time livestock are off water and include water management arrangements during delays and transit stops, aimed at ensuring maximum water deprivation times are not exceeded.
- 2) That the standards require a management plan for the sourcing and export of deer under 6 months of age. The management plan must address potential risks during transport

- including particular arrangements for the transport of young deer, management of young deer during delays, access to water, rest periods and any additional space requirements
- 3) That the standards require a management plan for the sourcing and export of miniature breeds and other livestock that do not meet the minimum liveweight requirements. The management plan must address potential risks associated with such young or light weight livestock during transport including their management during delays, access to water, rest periods and any additional space requirements
 - 4) That the body condition score tables for beef and dairy cattle, buffalo, sheep, goats, camels and alpacas included in [Appendix A](#) be adopted for air transport.

2.2 Sourcing of deer and camelids

2.2.1 Current requirements

To ensure positive animal welfare outcomes for livestock and handlers, there are a number of restrictions on male deer being sourced for export. These restrictions are based on the state of their velvet or antlers, including the stage of growth, status of velveting wounds and breeding season period. Similar restrictions also apply generally to deer within the rejection criteria for export.

Restrictions are also placed on camels in relation to the rejection criteria for export specifying the need for animals to have been conditioned for handling and can be appropriately housed within the chosen transport container or pen.

No alpaca or llama specific restrictions appear in the standards, other than a minimum weight for cria.

Table 4 Summary of sourcing requirements in ASEL v2.3

Species	Summary of requirement
Deer	<p>Male deer must not be sourced for export if they:</p> <ul style="list-style-type: none"> • Are in velvet or hard antler • Are in the first week after velveting • Have unhealed velveting wounds • Are inside the roar and rut period. <p>Under the rejection criteria, deer must not be exported if they have:</p> <ul style="list-style-type: none"> • Hard antlers longer than 5cm • Bleeding horn/antler stumps • Broken antlers • Velvet exceeding 10cm in length
Camels	<p>Camels, including wild-caught camels, must only be sought for export if they:</p> <ul style="list-style-type: none"> • Have become conditioned to being handled and to eating and drinking from troughs for a minimum of 14 days • Meet transport and shipping height requirements of the intended transport.
Alpacas and llamas	No specific restrictions

2.2.2 Discussion in submissions and literature review

While there was general agreement on the risks associated with exporting deer and camelids, there were differing views on the appropriate point at which to impose requirements to appropriately manage risk. A number of submissions suggested that specific requirements for

deer and camelids should be removed from the ASEL, consistent with recommendations from the ASEL: Sea Transport final report. It was also suggested during consultation, for both the air review and sea review, that the export of deer and camelids should be done through management plans. However, industry participants directly involved in the export of camelids and deer by air indicated that current requirements are appropriate.

A few submitters suggested that wild-caught deer and camelids should not be exported due to the increased stress and risk to health and welfare.

In regard to deer antlers, 1 submitter suggested that a qualified veterinarian be consulted while another suggested amendments to the current standards that are acceptable to the deer industry be adopted.

The literature review found no relevant studies or projects on the sourcing of deer and camels for air transport.

2.2.3 Committee views

In the ASEL: Sea Transport review process, the committee noted that provisions for deer and camelids transported by sea were outdated and not necessarily in keeping with current industry knowledge and practice. The committee observed that deer and camelids were rarely exported by sea. Accordingly, in the ASEL: Sea Transport final report, the committee recommended that the specific provisions in ASEL be deleted and detailed management plans should be required instead.

Although the export of deer and camelids by air is not a frequent occurrence, it is the primary method of export for these species in recent years (as shown in Table 2). Therefore, the committee was inclined to maintain the specific requirements in ASEL for the sourcing of deer and camelids for export by air.

In the case of camelids, the committee could see no reason to revise the current requirements for sourcing, including the current criteria for rejection from consignments at any point in the export selection and preparation process.

The committee received a submission from industry concerning inadequacies of some of the current requirements for sourcing and rejection for deer. Issues were raised with respect to deer with antlers, deer in velvet, and the importance of avoiding the roar and rut periods for male deer over 12 months old. The committee reached the position that the sourcing and rejection criteria for deer would be improved by tightening the standards that prevent the sourcing of male deer for export by air with respect to hard antlers, velvet and velveting wounds, and avoiding the roar and rut periods for male deer older than 12 months of age.

Recommendations

- 5) That the standards (S6.15) be amended to prevent male deer being sourced for export by air unless they have hard antlers removed leaving only buttons, they are not in the first 2 weeks after velveting and they are outside the roar and rut periods if they are over 1 year of age.
- 6) That the rejection criteria in the standards be amended to prevent deer being exported that have broken velvet.

2.3 Pregnancy testing requirements

2.3.1 Current requirements

In order to adequately manage the risks associated with pregnant animals on air export journeys, the pregnancy testing requirements and maximum days gestation for different classes of livestock have been defined. The maximum days gestation have been based on the gestation periods defined by the IATA Regulations and the OIE Code. Currently, ASEL outlines the requirements for suitability as a pregnancy tester based on the species and class of animal.

At the lower end of the requirement scale, the person must be able to demonstrate a suitable level of experience and skill, while at the upper end of the scale the person must be a veterinarian who is a member of the Australian Cattle Veterinarians and an accredited tester under the National Cattle Pregnancy Diagnosis Scheme, now known as PREGCHECK®.

Table 5 Summary of current pregnancy testing requirements in ASEL v2.3

Class	Summary of requirement
Breeder livestock	<p>Female livestock must only be sourced for export for breeding if they have been pregnancy tested (cattle using manual palpation, other species by ultrasound foetal measurement) within 30 days of export and certified, by written declaration, by a person able to demonstrate a suitable level of experience and skill, to be not more than the following maximum number of days pregnant at the scheduled date of departure:</p> <ul style="list-style-type: none"> For breeder cattle and buffalo—maximum days of gestation of not more than 250 days For deer (asix, fallow, sika)—maximum days of gestation of not more than 170 days For deer (rusa, red, reindeer)—maximum days of gestation of not more than 185 days For breeder sheep— maximum days of gestation of not more than 115 days For breeder goats—maximum days of gestation of not more than 115 days For camelids—maximum days of gestation of not more than 250 days <p>Livestock that are declared to be pregnant or that have given birth in the last 48 hours must not be tendered for transport unless accompanied by a veterinary certificate certifying that the animal is fit to travel and there is no evidence of imminent parturition.</p>
Breeder cattle and buffalo	<p>For cattle and buffalo a declaration must be made in writing by a veterinarian who is a member of the Australian Cattle Veterinarians and an accredited tester under the National Cattle Pregnancy Diagnosis Scheme and who pregnancy tested the cattle or buffalo.</p> <p>If the veterinarian:</p> <ol style="list-style-type: none"> is accredited under the National Cattle Pregnancy Diagnosis Scheme; and determines that cattle or buffalo are too small to be manually palpated safely; <p>the veterinarian may base this certification for cattle or buffalo on assessment of the animals by a method other than manual palpation.</p>
Slaughter cattle and buffalo	<p>Cattle and buffalo sourced for export as slaughter and feeder animals must be pregnancy tested by a registered veterinarian and certified not to be pregnant. A declaration must be made in writing by the registered veterinarian who pregnancy tested the cattle or buffalo.</p>
Slaughter sheep and goats	<p>Ewes with a weight of 40kg or more and all does (goats) must only be sourced for export as slaughter and feeder animals if they have been pregnancy tested by ultrasound within 30 days of export and certified not to be pregnant, by written declaration, by a person able to demonstrate a suitable level of experience and skill.</p>
Slaughter Damara sheep	<p>All female Damara breed sheep sourced as feeder or slaughter must be pregnancy tested within 30 days before export by ultrasound and certified not to be pregnant. The certification must be in writing, and given by a person able to demonstrate a suitable level of experience and skill.</p>
Breeder alpacas and llamas	<p>For alpacas and llamas a declaration must be made in writing by a registered veterinarian with demonstrable current experience in camelid pregnancy diagnosis and who pregnancy tested the alpacas and llamas.</p>

2.3.2 Discussion in submissions and literature review

Pregnancy testing requirements were discussed in a number of submissions. There was general agreement in submissions that the current requirements relating to maximum days gestation were appropriate for all species, and it was noted they are consistent with the OIE Code. However, some submissions suggested that livestock in general, or specifically cattle and buffalo, should not be transported in the last third of pregnancy and a further submitter recommended that pregnant goats should not be exported at all, both due to a risk of negative health and welfare outcomes.

Some submissions suggested that the requirement for pregnancy tests for breeding livestock exported by air to be undertaken during the 30 days prior to export was inappropriate for a number of reasons including; greater economic burden, lowered animal welfare outcomes and no scientific basis. While 1 submission called for the period of validation to be removed entirely, another submission suggested the time frame be increased to 70 days.

Many submissions agreed that there should be consistency between the air and sea standards for pregnancy testing requirements and supported the adoption of the pregnancy testing requirements recommended in the ASEL: Sea Transport final report. However, there were some submissions that advocated for alternative options such as requiring pregnancy testing only be done by a registered veterinarian, various suitable accreditation schemes for testers and the use of transabdominal ultrasound for sheep and goats.

The literature review found no relevant studies or projects on pregnancy testing or gestation of livestock exported by air.

2.3.3 Committee views

The committee considered general pregnancy testing requirements and gestation thoroughly in the ASEL: Sea Transport final report. For this reason, the committee's view was that pregnancy testing requirements for livestock exported by air should remain consistent where applicable with livestock export by sea.

The committee agreed that the definitions of a competent pregnancy tester and a valid pregnancy test as outlined in the Issues Paper should be adopted (see the [definitions](#) section of this report). The committee's view is that pregnancy testing breeder cattle should remain the domain of registered veterinarians, with additional accreditation under the National Cattle Pregnancy Diagnosis Scheme (now called PREgCHECK®) required to test cattle to determine the stage of pregnancy with accuracy. The committee agreed to retain existing flexibility for testing slaughter cattle, with those animals to be tested by either a registered veterinarian or a competent pregnancy tester. This is a matter that should be reviewed once national standards for pregnancy testing cattle are in place.

For sheep and goats, the committee agreed the standard should continue to allow testing by lay testers. Evidence was not provided to suggest that an alternative approach was needed. However, the committee agreed to extend the requirement for pregnancy testing of Damara breed sheep to all female fat-tailed sheep breeds.

The committee considered several submissions regarding the current requirement for pregnancy testing of livestock to be undertaken no more than 30 days prior to export. The committee was mindful that pregnancy testing was, in itself, an invasive procedure capable of

causing stress to livestock and that standards need to consider the welfare implications of the testing process itself as well as the welfare benefits being sought by requiring testing of livestock being prepared for export.

In considering this matter, the committee recognised that there are 2 different circumstances under which pregnancy testing is required. The first, is to confirm female slaughter and feeder animals are not detectably pregnant. In this instance, the requirement for a pregnancy test within 30 days of export makes sense. However, it is the committee's view that unnecessary re-testing must be avoided from a welfare perspective. The department should be able to extend the validity period of an existing test beyond 30 days where necessitated by circumstances outside the control of the exporter and where the exporter can demonstrate that the extension will not impact on animal welfare outcomes.

The second, and quite different circumstance, relates to female breeding animals. Breeding livestock may or may not be pregnant when exported, and pregnancy status is not in itself a welfare issue. The purpose of testing this class of livestock is to ensure that, if pregnant, the maximum gestation specified in standards is not exceeded at the time of export. The committee is of the view that it does not make sense to restrict the timing of such testing to a short period prior to export, that is 30 days. During the late stages of pregnancy, it can be considerably more difficult to determine the gestation with accuracy.

Accordingly, the committee resolved to recommend revision of the standard pregnancy testing requirements for breeding animals, by removing the provision requiring testing of this class of animals within 30 days of export. These changes are reflected in [Appendix B](#) of this report.

It was also decided that the existing gestation requirements for all species, which are consistent with OIE Code and IATA Regulations, should be retained. The committee recognised that the existing gestation requirements mean that livestock can be exported during the last third of pregnancy. The committee agreed with views, supported by evidence, raised in submissions of the potential risks and adverse impacts on animal welfare outcomes that can present during transport in this stage of pregnancy. The committee's view is that a management plan should be required to manage the potential risks this category of livestock may be exposed to during transport. The committee recommends that the use of management plans for livestock in the last third of pregnancy is monitored against performance of individual exporter(s) and shipments, and considered at future reviews of the standards.

Recommendations

- 7) That the pregnancy testing requirements detailed in [Appendix B](#) be adopted for livestock exported by air.
- 8) That the standards require a management plan for livestock exported in the last third of pregnancy. The management plan must address potential risks during transport including the management of livestock during delays, access to water, rest periods and any additional space requirements.

2.4 Non-farmed livestock

2.4.1 Current requirements

In order to provide positive animal welfare outcomes for wild-caught or non-farmed livestock, provisions have been made to ensure goats, deer and camels have been conditioned to handling and are familiar with eating and drinking from troughs for a minimum period before entering a registered or approved premises.

Table 6 Summary of non-farmed livestock requirements in ASEL v2.3

Applies to	Summary of requirement
Goats	Goats must not be sourced for export unless they have become conditioned to being handled and to eating and drinking from troughs for a minimum of 21 days before transfer to registered or approved premises.
Camels	Camels, including wild-caught camels, must only be sourced for export if they: <ol style="list-style-type: none"> have become conditioned to being handled and to eating and drinking from troughs for a minimum of 14 days; and meet transport and shipping height requirements of the intended transport (that is camels standing in their natural position do not touch any overhead structures).
Deer	Deer must only be sourced for export if they: <ol style="list-style-type: none"> are at least 6 months old; have been weaned for at least 2 months before sourcing for export, and have become conditioned to being handled and to eating and drinking from troughs for a minimum of 14 days.

2.4.2 Discussion in submissions and literature review

Submissions advocated the need for sufficient time to be provided for non-farmed livestock to adapt to handling as well as eating and drinking from troughs prior to export. Non-domesticated animals are more likely to suffer additional stress as they are not adapted to human contact, confinement and transport.

One submission indicated the time needed to adapt to handling should not be prescribed but should be determined on a consignment-specific basis. Another submitter suggested that animals be handled daily to ensure conditioning is effective. Others noted the importance of removing any livestock that had not adapted to feed, drinking or handling during or on completion of the required acclimatisation period.

In relation to goats, 1 submission suggested that while the requirement for goats to be held for a minimum of 21 days is directly relevant to sea transport, where the journey may take days or weeks, it is less applicable to air transport. This submission questioned the benefits of this practice for livestock exported by air transport, citing that livestock experience a quick export journey and slaughter process.

Some submissions called for exclusion of feral animals from export by air altogether, due to the stress of the export process making it difficult for the animals to become conditioned to handling in a few weeks.

The literature review referred to a study by Petherick (2005) that found when non-farmed animals (feral animals) such as goats and camels are exported by air transport, these animals may be considered compromised due to their lack of exposure to human infrastructure when

compared to farmed animals. Acclimatisation periods and third-party inspections prior to export are the current methods employed to reduce this risk.

In saying that, there is little published information regarding the required times or suitable methods for adaptation of non-domesticated animals to being handled, eating processed feeds and drinking from troughs. The effect of longer times (for example beyond the mandatory 14 days required for camels) on improving animal health and welfare outcomes is unknown.

However, a number of different methods for domestication of livestock have been investigated. It has been found that the methods employed to domesticate livestock during the preparation process are regarded as more important than the length of the process (Neindre et al. 1996; Flint and Murray 2001; Gherardi and Johnson 1994). Indicators that can be used to determine readiness of rangeland goats to be exported have also been investigated (Miller et al. 2018). Goats exposed to high human interaction or low human interaction were tested for agnostic behaviour, avoidance of humans and flight response.

2.4.3 Committee views

The committee noted that the current standard treats camels, goats and deer similarly for export by either air or sea. Goats must have been conditioned to handling and to eating from troughs for 21 days before being eligible to be sourced for export (ASEL v2.3, S1.20 and S6.13), for camels it is 14 days (ASEL v2.3, S1.23 and S6.16) and for deer it is 14 days (ASEL v2.3, S1.21 and S6.14). However, the standard is silent on additional requirements for buffalo by air.

The committee considered the case presented in 1 submission for reducing the amount of time goats should be conditioned to handling and to feeding from troughs prior to selection for export by air. The committee noted that goats have the highest mortality rate for animals exported by air, although still very low at 31 deaths from 89,000 (or 0.03%) head exported in 2016–2018.

The submission highlighted some of the potential benefits from minimising time spent in feedlot type situations, but stopped short of recommending what time period would be appropriate. The literature review refers to a study of rangeland goats in intensive farming practices over a period of 3 weeks by Miller et al. (2018), which found that the higher interaction between humans and the goats showed greater performance and behavioural changes. The committee also noted that a 21 day conditioning period has been generally adopted by the rangeland sector of the goat industry, for goats entering the domestic slaughter or breeder supply chain.

It was the committee's considered view that in the absence of more compelling data and scientific studies on how a shorter period would yield improved animal welfare outcomes, it would not be appropriate to recommend a change to the existing length of time non-farmed goats are to spend being conditioned to handling and eating prepared feed to be eligible for sourcing for export. However, the committee saw benefit in clarifying that this requirement should apply to non-farmed origin goats only, as they require a period of habituation to intensive farming conditions and to being handled prior to export. The committee agreed to amend the standard for deer, in line with the revised standard for non-farmed goats. The committee saw no reason to change the existing requirements for wild-caught camels.

For clarity, the committee in coming to this position, accepts that the conditioning period may be conducted at any time between the goats being harvested from the wild and sourced for export. It need not necessarily be done or repeated in the period immediately prior to sourcing if there

is satisfactory evidence the goats of non-farmed origin have, since capture from the wild, met this requirement in the past.

In the case of non-farmed buffalo, the committee considered that the standard should not be silent in relation to the export by air. It considered that there should be a specific requirement included in the standard that non-farmed buffalo be conditioned to handling and to feeding from troughs for a period of 21 days.

Recommendations

- 9) That standards 6.13 (goats) and 6.14 (deer) be amended to: require that non-farmed goats and deer must not be sourced for export unless they have become conditioned to being handled and to eating and drinking from troughs for a minimum of 21 days at some time before being sourced for export.
- 10) That the standards include a requirement for non-farmed buffalo to have become conditioned to being handled and to eating and drinking from troughs for a minimum of 21 days.

2.5 Vulnerable or special classes of livestock

2.5.1 Current requirements

ASEL v2.3 does not have requirements for livestock with young at foot, however there are provisions for livestock to be exported shortly after giving birth.

Table 7 Summary of vulnerable livestock requirements in ASEL v2.3

Applies to	Summary of requirement
All livestock	Livestock that are declared to be pregnant or that have given birth in the last 48 hours must not be tendered for transport unless accompanied by a veterinary certificate certifying that the animal is fit to travel and there is no evidence of imminent parturition.

2.5.2 Discussion in submissions and literature review

It was generally agreed that livestock with young at foot, livestock in the last third of pregnancy and livestock that had recently given birth are vulnerable classes of livestock. One submission suggested that the definition of vulnerable livestock be included in ASEL. Many of the submitters recommended that any existing provisions in the standards be removed and a requirement for a management plan be written into the standards.

A few submissions indicated livestock with young at foot should not be exported. Handling and long-distance transport of young livestock may cause unnecessary stress to both the mother and young. Another suggested that if exported, young animals must be able to walk, feed and thermoregulate at a minimum. The export of livestock that had given birth within 48 hours of the scheduled export was also discouraged. Another submission suggested that all livestock regardless of species, should be 14 days old at a minimum to be eligible for export.

The literature review found no relevant studies or projects on vulnerable or special classes of livestock exported by air.

2.5.3 Committee views

The committee noted that most submissions accepted that special consideration should be given to vulnerable species of livestock or special classes of livestock, such as those that have recently

given birth or that have young at foot, as they are potentially at a higher risk when transported. Vulnerable species need additional safeguards and management in relation to extended delays in the journey, access to water and rest periods. The committee noted that while many submissions supported management plans for these special classes of livestock, others were of the view that these livestock should not be exported at all.

The standard requires livestock that are declared pregnant or that have given birth in the last 48 hours to be accompanied by a veterinary certificate certifying that they are fit to travel and there is no evidence of imminent parturition (ASEL v2.3, S6.7). In discussions, the committee also referred to the Land Transport Standards, which require additional rest and water considerations for both pregnant livestock and livestock that have recently given birth. The committee considered the need for a fit to travel certificate essential for pregnant livestock, however given the higher welfare risk that livestock that have recently given birth could be exposed to during transport it was the committee's view that this class of livestock should not be exported. The committee therefore recommends that livestock that have given birth in the 5 days prior to the expected date of departure of the aircraft are not permitted to be exported.

In its consideration of pregnancy testing in [Section 2.3.3](#), the committee discussed the issues associated with transporting pregnant livestock, and accordingly, recommended the standards should be amended to require management plans for animals in the last third of their pregnancy (see [recommendation 8](#)).

For the transport of animals with young at foot, the committee noted that animals in this category are not routinely exported. However, the committee accepted that where this is intended, additional requirements should be imposed to manage the inherent higher risks to animal health and welfare. The committee therefore recommends that the standards be amended to require management plans for animals exported by air with young at foot. The committee recommends that the use of management plans for livestock with young at foot is monitored against performance of individual exporter(s) and shipments, and re-evaluated when the standards are next reviewed.

Recommendations

- 11) That the standards require a management plan for livestock that are exported with young at foot. This plan must address possible risks during transport including the management of livestock during delays, access to water, rest periods and any additional space requirements.
- 12) That the standards prevent livestock that have given birth in the 5 days prior to the expected date of departure of the aircraft, from being exported.

2.6 Livestock with horns

2.6.1 Current requirements

Horned livestock pose a safety risk to themselves, other livestock in the consignment and handlers. Therefore, there are provisions to limit the length, width and tip sharpness of horns in cattle, buffalo, sheep and goats.

Table 8 Summary of horn requirements in ASEL v2.3

Applies to	Summary of requirement
Cattle and buffalo	<p>Horned cattle and buffalo must only be sourced for export as slaughter and feeder animals:</p> <ul style="list-style-type: none"> a) For cattle, if the horns are 12cm or less in length and tipped (blunt); b) For buffalo, if the horns are no longer than the spread of the ears and are blunt; and c) If de-horned, wounds are healed. <p>Otherwise, horned cattle and buffalo must only be sourced for export with the approval of the relevant Australian Government agency</p>
Sheep	<p>Horned sheep or rams must only be sourced for export if the horns:</p> <ul style="list-style-type: none"> a) Are not turned in so as to cause damage to the head or eyes; b) Would not endanger other animals during transport; c) Would not restrict access to feed or water during transport; and d) Are 1 full curl or less, or are tipped back to 1 full curl or less. <p>Otherwise, horned sheep or rams must only be sourced for export with the approval of the relevant Australian Government agency.</p>
Goats	<p>Goats must only be sourced for export if the horns:</p> <ul style="list-style-type: none"> a) Are not turned in so as to cause damage to the head or eyes; b) Would not endanger other animals during transport; c) Would not restrict access to feed and water during transport; and d) Are no more than 15cm long and are blunt or are no more than 22cm long with tips no more than 20cm apart. <p>Otherwise, horned goats must only be sourced for export with the approval of the relevant Australian Government agency.</p>

2.6.2 Discussion in submissions and literature review

It was widely agreed that horn requirements for goats, cattle, buffalo and sheep should be consistent across the standards for sea and air.

A number of industry submissions noted that it is not common for horned cattle to be exported, and that dehorning mature cattle was not good animal welfare practice. It was suggested that cattle horn requirements should be in line with the Australian Animal Welfare Standards and Guidelines for Cattle – that “tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end”.

One submitter agreed with the nonvascular horn tip being removed to a diameter of 3cm but proposed that the 12cm horn length requirement be excluded. Another noted that if trimming the non-vascular portion of the horn results in a horn exceeding the maximum length, then it is not fit for shipping.

Multiple submissions discussed the need for further clarification of horn requirements as the standards were confusing.

In particular, 1 submission suggested that the current standard for horned goats is confusing and difficult to measure, while another submitter explained that the practise of measuring the “full-curl” maximum horn requirement of sheep was impractical. It was proposed that this requirement could be revised to improve clarity and animal welfare outcomes. The Land Transport Standards were referenced in relation to trimming or removing horns, and acceptable horn length requirements.

The literature review found no relevant studies or projects on horned livestock exported by air.

2.6.3 Committee views

The committee's considerations for horn length for cattle, buffalo and sheep were informed by the discussion in the ASEL: Sea Transport final report. The committee noted the Land Transport Standards guideline suggests horned bulls should have the nonvascular horn tip removed to a diameter of 3cm as well as the Australian Animal Welfare Standards and Guidelines for Cattle, which suggest tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end.

The committee's view was that requirements for livestock exported by air should remain consistent where possible with livestock exports by sea. The committee's position was to adopt the horn length requirements as per the ASEL: Sea Transport final report, with the exception of horn requirements for cattle. Rather, the committee recommends adopting the text in the Australian Animal Welfare Standards and Guidelines for Cattle:

- for cattle, tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end;
- for buffalo, if the horns are no longer than the spread of the ears; and
- for sheep, are no longer than 1 full curl.

Some submissions expressed possible difficulties encountered by both exporters and vets when measuring horn length against specific standards such as this. In consideration of this, and in the absence of alternative options, the committee believes consistency with existing national animal welfare standards is appropriate and the best approach.

The committee received a range of submissions and feedback from stakeholders that indicated the current requirements for goats are not adequate (ASEL v2.3, S6.12). The committee considered the requirements for goats in the Land Transport Standards, and reached a position that the standards should be amended to reflect the Land Transport Standards:

"...Where tipping is applied for bucks, horns should be tipped within 2.5–5cm from the tip (no further down than 2cm diameter of horn) and for does less than 2cm from tip to avoid sensitive zones. Tipping, where applied, should be done at least 7 days before transport."

Recommendations

- 13) That the requirements for horned cattle, buffalo and sheep outlined in [Section 2.6.3](#) of this report be adopted for air transport. That is;
 - a) for cattle, tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end;
 - b) for buffalo, if the horns are no longer than the spread of the ears; and
 - c) for sheep, are no longer than 1 full curl.
- 14) That the standards (ASEL v2.3, S6.12) for sourcing horned goats for export by air be amended in line with the Land Transport Standards: Horn trimming or removing sharp horn points is recommended to minimise injury to other goats. Where tipping is applied for bucks, horns should be tipped within 2.5-5cm from the tip (no further down than 2cm diameter of horn) and for does less than 2cm from tip to avoid sensitive zones. Tipping, where applied, should be done at least 7 days before transport.

2.7 On-farm preparation of livestock

2.7.1 Current requirements

The standards allow livestock to be prepared in either approved premises or registered premises. It stipulates that where livestock are prepared in registered premises then the standards for that part of the export chain apply (ASEL v2.3, 6.4(2)). There is no such requirement for livestock prepared in approved premises.

Maximum travel times and associated rest periods for livestock during land transport are outlined in the Land Transport Standards and Standard 2 of the ASEL v2.3. The maximum acceptable travel times vary for different species, and these are described in the appendices to the ASEL v2.3 (Appendixes 2.1 and 2.2). However, ASEL does not prescribe a set rest period for stock returned to the approved premises or property of origin from the airport should a delay occur, and prior to being reloaded for transport back to the airport.

2.7.2 Discussion in submissions and literature review

There was a great deal of discussion about on-farm preparation in submissions. Some submissions supported a maximum travel time from the property where the livestock are prepared to the airport, suggesting 8 hours as an appropriate timeframe which would make travel times consistent with sea transport.

Others argued alternative options. Some submissions supported a maximum time off water for the entire air export journey, rather than the standards imposing a maximum 8-hour travel time from the premises to an airport. One submission noted it is common practice for exporters to spell livestock along the trucking route from the premises to the airport. Most submissions agreed that travel times and rest periods if prescribed, should be consistent with the Land Transport Standards. However, 1 submission said that small consignments of livestock could travel without a maximum travel time if fed, watered and managed appropriately throughout the journey.

Introducing the mandatory use of registered premises (or an alternative) for livestock exported by air was not supported in most submissions, with some arguing the introduction would not produce improved animal welfare outcomes, but would substantially affect the economics of the trade. Submissions gave many reasons for supporting this view with many noting the high animal welfare outcomes produced under current processes. One submission also noted that using approved premises allows small or boutique shipments to be prepared without having to move the livestock from the property of origin.

It was generally supported that a minimum rest period be required for livestock that have been returned to the property, or other premises, from the airport, prior to them being reloaded onto trucks for export. Again, submissions referenced consistency with the Land Transport Standards for any new requirements. One submission indicated this could be outcomes-based, requiring livestock to be well rested, eating and drinking and fit to export prior to re-loading. Others agreed a period of 24 hours rest for adult livestock would be sufficient. One submission disagreed with the 24 hour rest period on the basis that it was too short and further consideration was needed.

The literature review referred to studies that indicated the pre-export preparation of livestock influences the performance of livestock on the export journey significantly. The majority of both

exporters and scientific experts in the field of live exports (100% and 55% respectively) believed that on-farm handling facilities and procedures have a moderate to high impact on performance during live export (Alliance Consulting and Management, 2001).

Exposing sheep to a pre-embarkation feedlot allows them to become accustomed to handling facilities and procedures while on farm. Animals conditioned to well-designed handling facilities using trained stock people, are less stressed by handling (Grandin, 1997). It has also been found that cattle handled gently overtime are less agitated, have less bruising and show improved weight gain (Grandin, 1997a).

The literature review also suggested that conditioning of livestock should be done early in life rather than just prior to export. Two studies found that the earlier livestock are handled, the better able they are to adapt to the psychological stresses caused by handling later in life (Dantzer and Mormede, 1983; Grandin, 1997).

Lastly, the literature review refers to studies that found total transport time is the most significant factor in transport stress (Wythes et al, 1981; Holmes et al, 1982; Warriss, 1990). Hence, it is important to keep the road journey to the airport as short as possible. It also pointed to evidence that exists that shows the negative effects of stress adaptation can be recovered if animals are allowed to rest after a stressful episode (Adams, 2000).

The literature review also found that the environment provided for livestock to rest in is important. Knowles et al. (1999) found that 42% of cattle did not consume water during the 1 hour rest period following 14 hours of road transport. They concluded that a 1hour rest stop with access to water was of limited value in terms of rehydrating the cattle. Tarrant and Grandin (2000) noted that unless resting facilities are adequate and the animals are unloaded with care, rest stops may be counterproductive and only serve to prolong the overall journey time.

2.7.3 Committee views

The current ASEL is not prescriptive on where livestock should be prepared for export by air and the distance the premises/farm can be from the departure airport.

The requirements for livestock to be prepared in a premises approved for pre-export are detailed in the *Export Control (Animals) Order 2004*. Maximum travel times and associated rest periods for livestock during land transport are outlined in the Land Transport Standards and Standard 2 of the ASEL v2.3.

During discussions, the committee noted that the ASEL requires livestock to be prepared in a registered premises for export by sea and some livestock prepared for export by air may be held in a registered premises, or in an approved premises. A registered premises must be no more than 8 hours journey time from the port of embarkation (ASEL v2.3, S3.0) but there is no equivalent limitation on livestock prepared in approved premises.

Many air export consignments involve small numbers of animals, often from a single farm, which can be more efficiently and effectively prepared at a location other than a registered premises. In addition, the committee recognised that the benefits of registered premises for conditioning livestock to be exported by sea may not exist or be required for livestock exported by air. This is, amongst other reasons, due to the significant difference in journey times for sea and air transport, and taking into account that livestock are rarely fed during air export journeys.

For small consignments (for example, alpacas for breeding) that can be prepared on or near their property of origin, the concept of an approved premises is likely to result in superior animal welfare outcomes than requiring them to be moved to a registered premises. In addition, there was no evidence that preparation of animals at an approved premises had resulted in an adverse welfare outcome or had failed to meet importing country requirements. The committee concluded that the approved premises option for air exports is fundamentally sound and should be retained.

Having decided that approved premises should remain as an option, the committee then considered whether the 8 hour transport rule should apply to approved premises. The committee did not consider there was compelling evidence presented to make a change. It concluded that, given all of the elements and variables in the air transport supply chain, focussing on a time limit for just 1 segment of that supply chain did not achieve an optimal outcome. Instead, the committee concluded that the focus should be on the time livestock spend off water during the entire journey, which is discussed in more detail in [Section 4](#).

It is inevitable that, despite best planning efforts, delays will occur during air transport. Weather events or mechanical issues can delay flights or render the aircraft unavailable, in turn delaying the export of a consignment. The standards currently require exporters to provide plans for such events (ASEL v2.3, S6.25). In the Issues Paper, the committee asked whether the standards should define a minimum rest period if livestock have to be returned to the assembly premises or alternative property because of a flight delay. There was broad agreement in submissions that a minimum rest period should be provided before re-loading again. The committee agreed with the views in submissions and concluded that the rest period should be a minimum of 24 hours.

Recommendations

- 15) That the standards require a minimum 24 hour rest period for any livestock that have been returned to an approved premises or alternative property after being transported to the airport, and prior to being reloaded for transport back to the airport.

3 Penning arrangements and crate design

3.1 Penning arrangements and crate design

3.1.1 Current requirements

ASEL v2.3 has established a number of penning and crate requirements which are detailed in Appendix 6.1 (of the standard), however there are some aspects of space allowance and penning arrangements not adequately covered. The space allowance for alpacas prescribes the use of the sheep space allowances, there is no provision for the penning arrangements or crate design for camels over 300kg, and there is no provision for the appropriate segregation of different types or classes of livestock.

Table 9 Summary of penning requirements in ASEL v2.3

Applies to	Summary of requirement
Alpacas	The space allowances table for sheep applies.
Camels	IATA Regulations stipulate that trained camels must be penned individually for air transport. However, wild-caught camels are not accustomed to individual penning or segregation and are best transported by air in cattle pens. Use of cattle pens must be limited to camels under 300kg liveweight.

3.1.2 Discussion in submissions and literature review

Penning arrangements and crate design were discussed in a number of submissions. The current requirements were generally considered adequate. It was acknowledged that penning arrangements and crate design should be consistent with current international standards for the transport of livestock by air such as the OIE Code and the IATA Regulations. It was noted in submissions that any changes to penning arrangements, without proven scientific evidence, that differ significantly from current international standards could result in potential violations and unintended negative animal welfare outcomes.

It was also noted that penning arrangements for livestock transported by air should minimise excessive stock movement of livestock at take-off, landing and during turbulence. One submitter noted that too few livestock in a pen can result in as many welfare issues as too many. The OIE Code states that animals confined in groups, especially in pens, should be stocked at a high enough density to prevent injuries at take-off, during turbulence and at landing. Goats and sheep in particular are herding animals and tend to move in close to each other in the crates. When they do this, mutual support, reinforced by the fixed support of the crate, can be lost if loading densities are too low.

In relation to the additional 10% space allowance required in the lower hold of aircraft, submissions argued that if livestock are weighed and drafted correctly, this was not necessary. It was suggested that there is no benefit to applying a 10% space increase for all consignments in the lower hold, which is over and above the IATA Regulations requirement. The IATA Regulations requires an additional 10% space for livestock loaded with mixed cargo in aircraft lower holds. One submitter noted that an additional 10% for animals with horns should be applied whether on main deck or lower deck.

While many submitters did not support rounding up of livestock space allocations, 1 submission noted that rounding up is not proven to have resulted in inferior welfare outcomes for air transport and that low morbidity and mortality levels for air shipments suggest that welfare has not been compromised. It was also acknowledged that industry practice is to use discretion in applying the rounding up requirement. Where animal welfare could benefit from rounding down it is often done at the discretion of industry. One submission stated that current OIE Code and IATA Regulations recognise that animals are of different shapes and specifying loading densities is an imprecise science. One submitter supported this theory noting that tall, skinny animals occupy a different amount of space than short, fat animals. For example, the space a tall 450kg Holstein would consume differs greatly to a short 450kg Angus. It was also noted that rounding up is not permitted on other forms of transport such as land or sea. While 1 submitter suggested that rounding up is not an issue at all, if the animals have been prepared well for their journey and drafted into weight lines according to their frame size and height.

Some submitters opposed to rounding down noted the increase in freight cost per head and the potential impact on Australia's international competitiveness, without achieving quantifiable animal welfare improvements. They also noted that a departure from well-developed international standards should only occur if overwhelming evidence exists that the international standards are no longer best practice.

The committee specifically questioned penning arrangements for camels and alpacas in the Issues Paper, noting the limited prescription currently contained within the standards. A number of submissions commented on the characteristics of camels and alpacas that should be considered when looking at penning arrangements for these species such as the ability for the animals to cush during transport. One submission suggested that the alignment of alpacas with sheep space allowances (as prescribed in the IATA Regulations) is not appropriate, and that alpacas require more room than sheep. It was recommended that aligning alpaca space allowances with the Land Transport Standards may be more appropriate. Another submitter suggested that loading densities for alpacas be based on a management plan and this plan must account for the age of the alpaca, fibre and climate of the final destination.

The issue of head clearance height within crates was addressed by a number of submissions, with many supporting the IATA Regulations requirement for head clearance. That is "animals standing in their natural position, without any part of their body touching the overhead part of the crate". It was also noted that the current Land Transport Standards do not have any related provisions. One submission questioned the subjectivity of the IATA Regulations requirement and instead suggested amending the standard to "animal's natural standing position" and a height limit imposed on individuals in a given consignment. One submission agreed with this and suggested that an additional 15cm clearance on top of this would be appropriate.

Many submissions called for the separation of entire males and females. While some submissions suggested that species, class and size, general health of the animal and level of aggression should all be considered prior to penning and crating for air transport. In addition, some suggested that penning and crating animals from different properties is generally not recommended unless animals are background checked first. One submitter suggested that mature buffalo bulls travel much better when mixed with pregnant females they have been prepared with, while another submitter suggested that mixed loadings should be under a

management plan, which could allow confirmed pregnant animals with bulls if they have been prepared together at all times, and their size and weight is approximately the same.

With regard to crate design, 1 submitter suggested that crates should be modern and use lighter sturdy materials, particularly for livestock that do not need re-enforced crates, such as sheep. The cost of freight through 'package weight' is extreme. It was also noted that crates should be designed to allow plenty of ventilation, be able to hold effluent and to be lined with sky mats. They also suggested that only single deck crates be loaded in the lower hold.

The literature review confirmed the importance of pen space allocations in all aspects of air transport. It influences animal comfort, behaviour and welfare from a space perspective; the production of heat, moisture, and expired gases such as carbon dioxide which will effect ventilation effectiveness. Critically, it will also affect the weight and load plan of the aircraft.

No scientific evidence was found regarding the impact of the current recommended space allocations or the process of rounding up on livestock behaviour during the crated journey, either in-flight or when waiting in transit. However, it has been found that at higher stocking rates it is known that animals may not be able to lie down simultaneously, or may be prevented from lying down (Cockram et al. 1996; Knowles et al. 1998), this may cause fatigue and muscle damage, particularly on long journeys (Knowles et al. 1998).

Animals must be stocked and managed at a density that allows them to maintain balance during take-off, landing and during periods of turbulence, similar to that experienced in road transport. How the temperament of animals may affect the manner in which they endure the long crating period or in-flight conditions is also not documented.

There is no published information about the effect of crate design on posture or behaviour and so it is not known what percentage of animals will lie down, if any, and if a recumbent position can be sustained to allow animals to rest.

With regard to crate design, the literature review notes that transport crates must provide strong, secure holding for the livestock, but need to provide aircraft specific features as well, such as consideration of weight, capacity for airflow through the crate, and holding of effluent. The review references a research project by Hogan and Willis (2009) which contains recommendations for best practice design of crates for livestock by air.

3.1.3 Committee views

It is important to note when the ASEL v2.3 was developed, the IATA Regulations and the OIE Code were considered, and penning arrangements and crate design specified in the ASEL are mostly consistent with IATA requirements. In considering penning issues, the committee was also mindful of its terms of reference to balance the implications for animal welfare with the practicalities of livestock management, compliance costs and industry sustainability; plus the direction that its recommendations must not be inconsistent with the OIE Code.

Penning arrangements, particularly space allowances, are critical to both animal welfare and the economics of the trade. Livestock stocked at too high a density can have adverse animal welfare outcomes through over-crowding, and those stocking livestock at too low a density can inadvertently create adverse welfare outcomes during take-off and landing. As the OIE Code notes:

... Animals confined in groups, especially in pens, should be stocked at a high enough density to prevent injuries at take-off, during turbulence and at landing, but not to the extent that individual animals cannot lie down and rise without risk of injury or crushing ... (Terrestrial Animal Health Code, Chapter 7.4, Article 7.4.3(f))

The space allowances in the current ASEL reflect the IATA Regulations and the OIE Code allowances in most instances, although there are slightly higher space allowances for heavier cattle in ASEL than the OIE Code suggests. The data on stocking rates and consignment outcomes that was available to the committee did not suggest that current space allowances were inadequate from an animal welfare perspective, except in the case of alpacas.

The ASEL requires alpacas to be stocked at the same space allowance as sheep. The committee considered this inadequate given the physical differences between the species. The committee was provided an analysis of space allowances used by industry when exporting alpacas by air over the past 5 years. It was clear to the committee that exporters are currently stocking alpacas over and above the sheep space allowances contained in the ASEL. The space allowances used by exporters aligned more closely to the space allowances required under the Land Transport Standards. As was suggested in submissions and evidenced by current industry processes, the committee concluded that alpacas should be provided at a minimum, the same space allowances as in the Land Transport Standards.

Camels do not currently have a separate table listing space allowances. The ASEL quotes the IATA Regulations for camels as detailed in Table 9. The committee is concerned that camels over 300kg are not addressed by this requirement. The committee is of the view that camels over 300kg should be penned in accordance with a management plan which would address the specific needs of the animal and conform to IATA Regulations crate requirements.

ASEL also stipulates that space allowances should be increased by 10% in 5 situations:

- 1) For horned cattle, buffalo, sheep and deer
- 2) For goats with horns that exceed the limits in S6.12
- 3) For journeys in excess of 24 hours
- 4) For sheep and goats with more than 25mm of wool or fibre
- 5) For livestock loaded with mixed cargo in the lower holds

The committee considers that these requirements should remain. In the case of horned animals, the provision of additional space is consistent with the committee's views as expressed in the ASEL: Sea Transport final report. For journeys in excess of 24 hours and animals with heavy wool/fibre, these are consistent with the IATA Regulations and the OIE Code.

In relation to whether additional space should be provided for animals loaded into the lower hold with mixed cargoes, the committee considered the findings of Hogan and Binns (2010). It was raised in submissions that the findings of this project indicate an additional 10% space should not be required in the lower hold as the capacity of the ventilation system in the lower hold is generally better than the main holds:

... if systems are correctly set by flight crews and airflows are not restricted by other cargo then the capacity of ventilation systems in lower holds of aircraft are generally better than main holds ... (p. 59)

The committee noted that ASEL requires, consistent with the IATA Regulations, additional space when livestock are loaded with mixed cargo in aircraft lower holds. The Hogan and Binns (2010) findings seem to apply only when there is no other cargo restricting airflow.

Additionally, the committee looked at a follow on study by Flynn, Wockner and Lott (2014), that aimed to validate the predictions of the LATSA software, through the acquisition of real time data on flights. This study found, amongst other things, that the LATSA model, which was used in the Hogan and Binns (2010) study, under-estimated relative humidity and wet and dry bulb temperatures in the lower hold by about 7°C.

The committee concluded that when there are mixed cargoes in the lower hold, given there is an increased chance that airflow could be restricted by other cargo containers, that the additional 10% space allowance should remain and the current wording in Appendix 6.1.1(2)(j) of the ASEL remain unchanged.

The committee also sought feedback on crate design in relation to head height clearance. The ASEL requires that when an animal stands in a natural position, no part of the animal's body (or horns) should touch any overhead part of the container. As no scientific evidence for change was presented to the committee, the IATA Regulations and the OIE Code were considered when discussing this issue.

The OIE Code requires 10cm clearance for an animal standing in its normal position. The IATA Regulations require 10cm clearance for small animals and 20cm clearance for large animals. As discussed in [Section 7](#), the committee is recommending the standards include a general provision to require compliance with IATA Regulations and therefore it is the committee's view that the standards do not need to be amended at this time to reflect a minimum head clearance height.

In respect of penning of livestock of different classes, the views in submissions varied from a full prohibition on mixed sex loading, to allowing castrated males to be penned alongside females, to allowing young bulls to be penned with pregnant females with which they have been prepared for export and which are of similar size and weight, and to mixing animals from different source properties being prohibited. One submission noted that mixed sex loads of goats and sheep had been occurring, and that even some shipments of heifers and young bulls had occurred. Several submissions cited the Land Transport of Livestock Standard which requires segregation to consider species, class and weight.

The committee noted that it is standard industry practice for animals of similar size and weight to be penned together and that, where possible, exporters also seek to keep animals from the same source property together. Even though this is common practice, the committee thought it was important to include a provision in the standard to ensure livestock are penned with like animals, that is animals of the same species, class and weight. In relation to mixed sex loading, the committee agreed that loading castrated males with females of similar species and weight was acceptable. However, the committee remained concerned about the welfare risks of placing entire males and females in the relatively small spaces available in aircraft crates. Where loads

are sufficiently large, such as charter aircraft with large numbers of crates, the committee considered that entire males should be segregated from females whenever possible to mitigate the potential welfare risks and is, therefore, recommending the standard be amended to prevent entire males being penned with females.

The committee also considered the provision in the standards for rounding up when calculating space allowances. The space allowances prescribed in the ASEL (and the IATA Regulations), rarely result in a whole number of animals per crate. When the calculation results in a fraction of an animal, the ASEL currently requires the number of livestock in the pen to be rounded to the nearest whole number, with n.5 rounded up (That is, ASEL requires anything less than n.5 is rounded down and anything equal to or greater than n.5 must be rounded up). Rounding up may result in each animal receiving less than the space allowance in ASEL while rounding down results in more space per animal.

One of the practicalities to be considered is that aircraft crates are limited in their dimensions by aircraft systems. Additionally, there are standard pallet sizes depending on the aircraft type and load space (main deck or belly hold) which means crate space is not flexible. For the purposes of the committee's considerations an average, medium sized crate with a useable floor space of 6.3m² has been assumed (source: LiveCorp submission, page 17).

The committee examined a number of scenarios to assess the impact of rounding and the consequential impact on animal welfare, these scenarios are outlined in Table 10. For smaller animals the impact is modest, with a relatively small influence on the space allowance. However, for larger animals, such as heavy cattle, rounding can result in a significant change to the space allocation per animal.

For example, when loading cattle of 400kg the ASEL allows 1.06m² per head for journeys of less than 24 hours and 1.166m² for journeys of more than 24 hours. In a medium size crate, 5.94 cattle can be loaded for a journey of less than 24 hours and 5.403 cattle can be loaded for a journey of more than 24 hours. The animals loaded into this crate would, in theory, be rounded up to 6 for a short journey and down to 5 animals for a journey of more than 24 hours. Each animal would get approximately 8% more space than prescribed under ASEL for the longer journey, and marginally less space on the shorter journey.

Table 10 Implications of rounding up at n.5 for journeys of less than 24 hours

Species and weight	ASEL space requirement (m ²)	ASEL animals per crate ¹	Rounded number of animals	Rounded space per animal (m ²)	Percentage change from ASEL
Cattle					
300	0.840	7.500	8	0.788	-6.25%
320	0.890	7.079	7	0.900	1.12%
340	0.930	6.774	7	0.900	-3.23%
360	0.980	6.429	6	1.050	7.14%
380	1.020	6.176	6	1.050	2.94%
400	1.060	5.943	6	1.050	-0.94%
420	1.100	5.727	6	1.050	-4.55%
440	1.150	5.478	5	1.260	9.57%
460	1.190	5.294	5	1.260	5.88%
480	1.230	5.122	5	1.260	2.44%
500	1.270	4.961	5	1.260	-0.79%
520	1.310	4.809	5	1.260	-3.82%
540	1.360	4.632	5	1.260	-7.35%
560	1.400	4.500	5	1.260	-10.00%
580	1.440	4.375	4	1.575	9.38%
600	1.480	4.257	4	1.575	6.42%
Sheep					
30	0.190	33.158	33	0.191	0.48%
40	0.230	27.391	27	0.233	1.45%
50	0.270	23.333	23	0.274	1.45%
60	0.315	20.000	20	0.315	0.00%
70	0.360	17.500	18	0.350	-2.78%
Goats					
25	0.141	44.681	45	0.140	-0.71%
35	0.189	33.333	33	0.191	1.01%
45	0.237	26.582	27	0.233	-1.55%
55	0.285	22.105	22	0.286	0.48%
65	0.333	18.919	19	0.332	-0.43%
75	0.381	16.535	17	0.371	-2.73%

1. An average, medium sized crate has been assumed with dimensions of 2.14m x 3.08m, giving a gross area of 6.59m². Allowing for the frame, the usable internal space is approximately 6.3m² (source; LiveCorp submission, page 17).

In another example, when loading cattle of 500kg, the ASEL allows 1.27m² per head for a journey of less than 24 hours. In a medium size crate, 4.51 cattle can be loaded. The animals loaded into this crate would, in theory, be rounded up to 5 animals. Each animal would get just under 10% less space than prescribed under ASEL.

Significant reductions in space per animal can have negative welfare outcomes, especially when the time spent in crates is prolonged or greater than 24 hours. Reducing space may impact the

ability of animals to lie down and rest, increase injury as animals step on and over each other, impact their ability to rise un-hindered and may result in insufficient ventilation, especially in mixed cargo and multi-tiered crates. The allowances in regulations are set as minimums for road, sea and air transport in recognition of the welfare needs. The committee accepted that air transport is similar to other modes where animals need to be somewhat supported by each other during crate motion and during turbulence, however it is different in that the costs are high compared to the other modes of transport. A prohibition on rounding up was considered but not endorsed.

The committee considered changing the rounding point from n.5 to n.7 to address the significant loss of space per animal and consequent impact on welfare when any rounding up occurs. The analysis showed that such a change would eliminate any large individual loss of space for animals less than 500kg, with the most space an animal may lose as a result of rounding up limited to about 5%. The results were more mixed for very heavy cattle (>800kg) – they would still experience a reduction in individual space from rounding up on short journeys of up to 10%, but on journeys over 24 hours cattle would get additional space of up to 30%.

Further, the committee examined all the cattle weights in the current standards (ASEL v2.3, Appendix 6.1, Table A6.1.1) to assess the impact of raising the point for rounding from n.5 to n.7. For journeys of less than 24 hours, it found that 15 of the 86 weight categories would have 1 less animal per crate. For journeys of 24 hours or more, it found that 21 of the 86 weight categories would have 1 less animal per crate. Table 11 lists the weight categories that would change. The greatest impact occurs for very heavy cattle: for journeys of less than 24 hours, 5 of the 15 categories that would incur a reduction are for cattle in excess of 700kg; and for journeys of 24 hours or more, 12 of the 21 categories that would incur a reduction are for cattle in excess of 600kg.

Table 11 Cattle weight categories that would change if the rounding point is raised from n.5 to n.7

Applies to	Journeys of less than 24 hours	Journeys of 24 hours or more
Cattle weight categories (kg) that would require 1 less animal per crate of the rounding point is raised from n.5 to n.7	150, 180, 210, 250, 290, 300, 350, 430, 540, 550, 710, 720, 730, 740, 750	150, 210, 260, 310, 380, 390, 480, 490, 500, 630, 640, 650, 660, 910, 920, 930, 940, 950, 960, 970, 980

The committee also examined the 'Calculation Table' for cattle in section 8.2.2 of the IATA Regulations. The table is not extensive and the rounding practice does not appear to be consistent. For example, using the standard pallet of external dimensions 224cm by 318cm (yielding a crate with internal space of 6.3 square metres) the 4 entries for cattle give mixed results. At 300kg, the theoretical loading is 7.5 cattle but the IATA table rounds this down to 7. At 500kg and 600kg the IATA table rounds to the nearest whole numbers. And at 700kg the IATA table indicates either 3 or 4 animals per crate, compared to the theoretical number of 3.8.

Discussions with industry, and practice observed by the committee, revealed that rounding down above n.5 is quite common. Exporters report that they make judgements about the animals in the consignment, how they will travel best and then stock crates at a rate they consider optimal even though they may be legally able to stock at a higher density. The exporters in these cases appear to be accepting that any financial loss through stocking at a lower density is offset by the welfare gains.

The committee noted that the rounding up point can affect the economics of the trade. The analysis showed that for cattle there are several key weights which would result in higher freight costs per head. While all export journeys differ, the impact can be illustrated by examining a B747-400 flying from southern Australia to South-East Asia. For a consignment of cattle of 350kg, the additional freight cost per head resulting from a change in the rounding point to n.7 would be in the region of \$250–\$300.

However, by selecting cattle at a slightly different weight, the impact could be avoided. For example, there would be no impact if the cattle in a crate were 340kg. Exporters could be expected to change their selection and loading requirements to mitigate the financial impact. And as noted, those exporters already rounding down are accepting an overall higher freight cost per head.

And as discussed in [chapter 9](#), aircraft performance limitations can also mean that it is not possible to stock at ASEL densities, forcing exporters to round down at above n.5.

Analysis for goats showed that reducing the number of 45kg goats in a crate from 27 to 26 would result in a 3.7% increase in the freight cost per goat. The heavier the animal, the more significant the impact.

In considering changing the rounding requirement, the committee's view was that the requirement to round up at n.5 should be revised to rounding down at n.7 (and below).

Recommendations

- 16) That the space allowances in [Appendix C](#) be adopted for alpacas (this table is based on the Land Transport Standards space allowances).
- 17) That the standards require camels over 300kg liveweight to be penned for air transport in accordance with a management plan.
- 18) That the standards require livestock to be penned for air transport with animals of the same species, class, gender and of a similar weight (note: castrated males may be penned with females however entire males must be penned separately). Animals must be crated with similar weighted and sized animals or the crate must be divided so that animals of unequal size are penned separately.
- 19) That the current wording in 6.1.1 (2)(b) be changed to – “that when calculating the stocking density per pen, the number of livestock per pen may be rounded to the nearest whole number. n.7 (and below) must be rounded down.”

4 Fodder and water requirements

4.1 Fodder and water requirements

4.1.1 Current requirements

Maximum water deprivation times are outlined within ASEL v2.3, Standard 2. They aim to prevent livestock suffering dehydration and other negative welfare impacts during transport. Feed and water are generally required to be offered to all livestock for export by air while in transit if the climatic conditions, species and class of livestock, and total journey time warrant, however there is no further elaboration of what these conditions are. There is also no provision for exporters to provide a plan addressing how they will provide water or feed to livestock on the journey or provision for a breach of water deprivation time to be a notifiable incident.

4.1.2 Discussion in submissions and literature review

There was strong support for a management plan for water deprivation time throughout the air export journey, including during transit. Many noted that the air export journey needs to be defined in the standards, with suggestions for the journey to begin at the approved premises and end at unloading at the final destination (on farm).

It was noted in a couple of submissions that exporters are very aware of managing water deprivation and feed and have a demonstrated history of working with importers to ensure livestock are not put at risk of any adverse animal welfare outcomes. These submissions did not support the inclusion of a management plan. Rather, they concluded that the current standards are working well and any additional regulatory burden, such as a management plan, would not provide an animal welfare benefit. A further submission suggested that water deprivation times are currently conservative and could be increased to reduce faeces and ammonia presence during transport, improving travel conditions.

Overall, the maximum water deprivation times in the Land Transport Standards were referenced by a number of submissions, with general agreement that any maximum water deprivation time should align with the species and class requirements included in the Land Transport Standards. One submission noted that exporters are currently adopting the 48 hour maximum water deprivation time for livestock for the air export journey, as specified in the Land Transport Standards (this requirement is for livestock over 4–6 months). While another submission suggested that maximum water deprivation time should be 12 hours.

Another submitter suggested that water deprivation limits should be applied cumulatively to all parts of the journey, including the air transport phase. This would require reliable communication between receivers, transport operators, drivers and persons responsible for pre-transit livestock preparations.

One submitter proposed IATA Regulations relating to feed and water recommendations and requirements before and during the air export journey should be considered. These regulations, while not strictly compatible or with current industry practise, apply generically to all species of animals, including livestock.

The literature review noted that the effects of extended water deprivation times on livestock during air transport are not reported. The effects of water deprivation during land transport has

been extensively reviewed by Fisher et al (2006) and research by Ferguson and Fisher (2008). In those studies it was noted that food, or food and water deprivation over varying periods up to 72 hours did not affect blood cortisol concentration in cattle (Gaylean et al. 1981, Parker et al. 2003a), sheep (Warriss et al. 1995; Horton et al. 1996) and goats (Kannan et al. 2000) indicating it was not stressful to ruminants.

Some studies have shown that cattle deprived of food and water up to 48 hours have shown some signs of dehydration (Schaefer et al. 1990, Phillips et al 1991, Parker et al 2003a). However, in these studies the level of dehydration even after 48 hours could not be classed as being of clinical concern.

A study by Fisher et al. (2010) found that loading and the initial phase of transport were the most stressful to livestock as indicated by the increase in blood cortisol concentration and body temperature. They also concluded that current maximum transport duration, which is based on the maximum period of water deprivation (48 hours), within the welfare codes for cattle and sheep are acceptable on animal welfare grounds for the class of stock examined and the experimental conditions that prevailed.

Parker et al (2003b) indicated that sheep may also be reasonably tolerant of considerable periods of water deprivation, with indications only appearing after 72 hours of water deprivation. The literature review also reported on the interaction between water deprivation and the environment, with animals subjected to hot and humid conditions are more affected by water deprivation that limits their capacity for evaporative heat loss and dehydration.

It was suggested that pre-transport curfews should be predicated on consideration of key factors such as the nutritional background and condition of the cattle and sheep, and the duration of the total transport process.

In addition, the literature review noted that total transport times is the most significant factor in transport stress (Wythes et al, 1981; Holmes et al, 1982; Warriss, 1990). All exporters and 90% of experts believed that minimising total transport time will have a moderate to high impact on performance of stock during live export (Alliance Consulting and Management, 2001). However, unlike most land transport journeys, the animals to be exported by air are not provided access to food and water upon completion of the road journey. It is important to keep the road journey to the airport as short as possible.

4.1.3 Committee views

In considering the fodder and water requirements of livestock undertaking export journeys by air, the committee was mindful of a number of aspects of the air export process: the practical limitations of providing feed and water to livestock once they are crated for transport; the short time frame of most air export journeys from Australia; and current industry practices regarding water deprivation times. It is also important to note that negative animal welfare outcomes may result from attempts to provide water and feed to livestock while in flight.

The committee was of the view that the provision of feed to livestock during export journeys by air was generally unnecessary and the current ASEL provisions and IATA Regulations relating to provision of feed to livestock were adequate.

In relation to maximum water deprivation times, the committee was concerned that when pre-export land transport, holding periods and transit stops were taken into account, some air export journeys from Australia could be quite long. Furthermore, unexpected delays along the journey could significantly extend the planned period that livestock are in transport crates beyond acceptable water deprivation times. Although the committee found no reports that confirmed the withholding of water during flight had created welfare problems, a number of submissions supported the idea that water deprivation should be closely managed.

The committee did not believe it was necessary to specify time limits for any particular phase of an air export journey, or to require provision of water during transit stops over and above the current requirements. Rather, the committee considered the matter in terms of a maximum water deprivation time covering the whole journey, that is from the time livestock are curfewed at the premises or farm to the point water is made available to them again. The committee was of the view that the Land Transport Standards provide an existing standard that is nationally agreed and widely adopted by industry already. This view was supported throughout submissions. The committee resolved that the maximum water deprivation time defined in the Land Transport Standards should be adopted into ASEL for each species.

The committee was of the view that a management plan setting out routine and contingency arrangements for avoiding unacceptable periods of water deprivation would provide a useful and practical means for exporters to demonstrate that risks will be managed. The plan should set out arrangements that will be in place to manage the water deprivation time and how the exporter will ensure that the acceptable maximum water deprivation time will not be exceeded.

For example, if the whole journey cannot be completed within the maximum water deprivation time, then the management plan would need to include arrangements for the animals to be offered water at a point in the journey so that the maximum water deprivation time is not exceeded. The department should examine the times proposed in the management plan to ensure they are realistic and require exporters to adjust them as needed.

In considering the potential added burden of such a requirement, the committee expected that most exporters make such provisions already in their planning for air consignments of livestock.

Additionally, the committee noted that current reporting arrangements were insufficient to provide information about water deprivation times currently experienced by livestock during air export journeys.

The committee is of the view that minimising water deprivation is extremely important to an animal's health and welfare and, as such, is recommending that a new notifiable incident be created if a consignment exceeds the allowable maximum water deprivation times. The committee also believes that it would be useful to include more information in end of journey reports. Further discussion on this is under [Section 6](#) of this report.

Recommendations

- 20) That a management plan for water deprivation time during the whole journey be required for all livestock consignments by air. This plan should address the time livestock are off water and include water management arrangements during delays and transit stops, aimed at ensuring maximum water deprivation times are not exceeded.

21) That the maximum water deprivation times reflected in the Land Transport Standards be adopted as detailed in [Appendix D](#).

5 Inspection of livestock

5.1 Inspection of livestock

5.1.1 Current requirements

In order to ensure the health and welfare of livestock exported by air, inspections must be carried out. These are prescribed at set points during the air export journey where it is feasible to inspect livestock. Any livestock that are identified during inspection as distressed or injured must be appropriately treated, separated or removed from others, or euthanized as necessary and feasible.

Table 12 Summary of inspection requirements in ASEL v2.3

Summary of requirement
<p>Livestock for export by air must be checked to ensure they remain fit to travel:</p> <ul style="list-style-type: none"> a) Immediately before departure; b) Where feasible: <ul style="list-style-type: none"> i. Within 30-60 minutes of commencement of the journey; ii. At least every 2-3 hours as conditions warrant; and c) Immediately prior to departure after any stops. <p>Any livestock for export identified during transport by air as being distressed or injured must, where feasible:</p> <ul style="list-style-type: none"> a) Be given immediate treatment if distressed or injured; b) Be euthanized without delay as necessary; and c) Arrangements must be made to remove or separate sick or dead livestock from pens carrying multiple animals in transit. If animals need to be off-loaded, arrangements must be made to ensure the health and welfare of the animals.

5.1.2 Discussion in submissions and literature review

Most submissions agreed that the current inspection requirements in ASEL were generally practical and feasible. However, there were some suggestions for additional inspection points including prior to departure from the premises; before being loaded into crates; once loaded into crates, before being loaded on to the aircraft; and as soon as the aircraft lands. Another submission suggested that in the absence of manual inspections – which can be stressful for animals – use of video monitoring should be utilised during flight. A number of submissions called for the continuous monitoring of conditions during the flight and suggested real time monitoring can be used to monitor the on-board environment – such as cabin pressure, ventilation, humidity, temperature and lighting – and may be included as a reporting requirement. One submission calls for the monitoring of ammonia levels in transport crates during the journey, and setting a maximum level for ammonia.

While there was wide support for an appropriately skilled and competent person to accompany livestock on-board flights, it was also understood that sometimes this was not possible. In those cases, where access to livestock transported in the lower hold was not possible, it was noted that the greatest risks for animals transported by air occur during loading and unloading from the aircraft, transit stops or if an aircraft is diverted. A number of submissions supported having a competent person available to monitor these aspects of the journey and argued that it is critical to ensure the welfare of the livestock.

It was noted in 1 submission that the facilities at airports do not always provide staff with appropriate access to inspect animals or remove any unfit/rejected animals. Another suggested that businesses should invest in good quality, fit-for purpose infrastructure, including loading and unloading equipment—forcing yards, ramps and enclosed gantries—to safely and efficiently load livestock into cargo planes, noting that currently trucks are used as mobile forcing yards, with livestock transferred directly from the truck into the crates in which they are transported.

One submitter noted that all animals transported by air should be accompanied by an experienced stock person. This attendant should have sufficient skills and status to make airline staff aware of the needs of the cargo at loading, during stopovers and at landing.

The literature review noted that there was very limited information on the ability to inspect livestock at airports. Anecdotal evidence suggests there can be a lack of access to crates during flights and transit, and it is unclear to what degree the current standard can be met.

The standards of loading and unloading facilities for livestock has been investigated and is an important factor for the welfare of livestock and the safety of personnel involved (Lapworth 1990). The Code of Practice for the Land Transport of Cattle (MCOP 1999) also has recommendations for loading/unloading facilities including, design of race, ramp and the need for artificial light at night.

In relation to monitoring temperature and environmental condition monitoring during flight, the literature review refers to a study by Hogan and Binns (2010) which looked at the Live Air Transport Safety Assessment (LATSA) software. The program presents the heat, moisture and carbon dioxide outputs for any single consignment of cattle, sheep and goats and any combination of these livestock. It then uses psychometric calculations together with publicly available aircraft ventilation data to determine if the aircraft has the basic capability to transport the consignment without incident.

5.1.3 Committee views

The committee examined the current ASEL requirements for inspection of livestock and considered all relevant submissions. The committee accepted that the opportunity for, and welfare benefits of, inspecting livestock during flight are limited. Livestock in netted crates are difficult to inspect, and attempts to do so may unduly agitate the livestock and have negative welfare affects. Notwithstanding this, it was the committee's view that the current requirements (ASEL v2.3, S6.22 and S6.23) were adequate as general provisions.

A number of submissions highlighted that the greatest risks to animal welfare involving air transport is during loading and unloading of the aircraft and during transit stops including when an aircraft is diverted. The committee also noted that where mortalities have occurred in the past and where exporters reported poor welfare incidents occurring, the incidents mostly relate to inadequate ventilation (for example due to delays in opening cargo door once planes on tarmac). Having a competent person available during these periods can ensure that the health and welfare of the animals is taken care of, and that handling, unloading and/or loading of livestock crates can be completed appropriately and with due regard to animal welfare. If this person were a representative/appointee of the exporter they would also be in a position to be in direct contact with the exporter during any unexpected delays or diversions should any situation of concern arise. Specifically, this person should be able to inspect livestock early after commencement of the flight, again during the flight and as soon as possible after landing paying

particular attention to the quality of ventilation and crate temperatures. It is also suggested that the livestock should be inspected immediately prior to departure after any transit stops, to ensure livestock remain fit to travel. Exporters' contingency plans should explain how, in the absence of an accompanying attendant, they would gain access to a competent person to oversight the animals' welfare in the case of unplanned stops/diversions.

The committee noted the support in submissions for an attendant to accompany major shipments. The committee also noted advice from 1 industry body that from 1 July 2019 the policy for their members is that an attendant accompany any shipment of livestock on a freighter aircraft, irrespective of the number of animals in the shipment. The cost of requiring an attendant to accompany a flight is not insignificant when salary, return air fare, hotel accommodation, ground transportation and incidentals are factored in.

The committee considered that there is justification for the ASEL to require a competent, exporter-appointed attendant accompany air consignments when the livestock were exported on a charter aircraft, to oversee the welfare of the livestock during flight, but in particular at transit stops and during unloading of the aircraft. The greatest risk to livestock welfare occurs when there is extended transit stops or unintended diversions as these are likely to extend the period of time the livestock are off water and remain in the crate. After such delays, the livestock must be reinspected to ensure they remain fit to travel.

The committee further considered that there may be justification for an attendant to be required on freighter services, depending on the size of the consignment, the number, if any of transit stops and the experience or performance history of the exporter. The committee was of the view that the responsible government authority should have scope to exercise some discretion to waive a requirement for an attendant on some freighter services based on these and other parameters it believes appropriate. The use of attendants should be detailed in the exporter's contingency plan.

For consignments transported on aircraft in the lower holds or passenger aircraft, that is when neither the stock nor the cockpit (i.e. ventilation controls) are accessible during flight, it is the committee's view that there should be an exporter-appointed attendant available/accessible at transit stops and during unloading of the aircraft to oversight the management and handling of the livestock to ensure due regard is taken to the health and welfare of the animals. The committee is of the view that this attendant may be a locally engaged person, who would have the necessary security and access clearances for the airport already in place, and this should be detailed in the exporter's contingency plan.

The committee received a number of submissions regarding the facilities at Australian airports for the inspection and loading of livestock into crates. The committee attended Melbourne airport during the loading of a consignment of cattle for export and observed the procedures and facilities. Cattle were unloaded from trucks, including from upper decks down reasonably steep ramps, directly into the crates. Arrangements for the orderly pushing of cattle between truck pens and down ramps were of a poor standard compared to most cattle unloading facilities in Australia, such as at saleyards. Based on submissions received, and the committee's observations, the committee believes the facilities at airports for livestock unloading (from trucks) and inspection could be improved.

Recommendations

- 22) The exporter must ensure a competent attendant is present during planned transit stops and unloading of livestock from the aircraft to oversee the welfare of the animals.
- 23) That the standards require a competent attendant appointed by the exporter(s) accompany consignments where the livestock are transported:
 - a) on all charter aircraft dedicated to livestock; and
 - b) on a freighter aircraft unless otherwise agreed by the relevant government authority.The role of the attendant is to oversee the welfare of the livestock during flight, at transit stops and unloading of livestock from the aircraft.
- 24) That standard 6.22 is amended to:
Livestock for export by air must be checked to ensure they remain fit to travel:
 - a) immediately before departure;
 - b) where feasible:
 - i) within 30-60 minutes of commencement of the flight;
 - ii) at least every 2-3 hours during the flight;
 - iii) as soon as possible after landing
 - c) immediately prior to departure during any transit stops.
- 25) The department should work with the relevant organisation(s) to review and improve the facilities available at airports for the unloading of livestock from land transport, inspection and loading into crates and loading onto the aircraft, to ensure they meet the standards expected to mitigate risks associated with animal health and welfare.

6 Reporting requirements

6.1 Reportable mortality rate

6.1.1 Current requirements

Reportable mortality is currently defined as a whole-of-consignment mortality rate for the livestock export journey which, if exceeded, triggers the requirement for the journey to be investigated as having a notifiable incident occur. A notifiable incident is defined by ASEL v2.3 as including a mortality rate equal to or greater than the reportable level as previously described.

Table 13 Summary of reporting requirements in ASEL v2.3

Species	Current requirements
Sheep, goats, camelids and deer	2% or 3 animals, whichever is greater
Cattle and buffalo, voyages \geq 10 days	1% or 3 animals, whichever is greater
Cattle and buffalo, voyages $<$ 10 days	0.5% or 3 animals, whichever is greater

6.1.2 Discussion in submissions and literature review

Performance indicators for the past 3 years show a very low mortality rate in sheep and goats and no mortalities for other species. It was generally agreed in submissions that the reportable mortality rates should be lowered in line with the recommendations from the ASEL: Sea Transport final report.

However, 1 submitter proposed that due to the comparatively much shorter journey time than that of sea export voyages, the reportable mortality rate for air export should be lowered to 0.5% for sheep, goats, camelids and deer, and 0.2% for cattle and buffalo. The submission also suggested that morbidity be reported for air export journeys, in line with purported community expectations.

One submission suggested that reportable mortality rate should be reported using median mortality values rather than average mortality values due to skewing of mortality rates by infrequent outlier events. Another submitter recommended that reportable mortality rate should apply to the whole journey including land transport phases.

The literature review found no relevant studies or projects on the mortality levels for livestock exported by air transport.

6.1.3 Committee views

The committee examined the current ASEL requirements for the reportable mortality rates and considered all relevant submissions. The objective of requiring notification 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 continual improvement. Factors that may impact a high mortality event are varied, and allowing investigations to better understand the specific circumstances that contribute to a notifiable mortality event is important.

The committee accepted that the recent performance of export consignments (during 2016–2018) shows, in general, very low mortality rates. It was also noted that the mortality rates

experienced are considerably lower than the current reportable rates, bringing into question the suitability of the current rates for air transport. The infrequent occurrence of a reportable mortality event or investigation was also noted by the committee. It was the committee's considered view that the mortality rates for air transport should be reduced, and in the first instance the mortality rates recommended in the ASEL: Sea Transport final report should be adopted.

The reportable mortality level covers the air export journey only, that is from the time animals are loaded into crates to when the consignment is unloaded at the destination airport. The committee noted in its discussion that animals may be trucked directly from the airport to farms still in the crates used for air transport, however this leg of the export journey is outside the scope of the standards and thus, the review. The committee is aware that any mortalities during land transport in the destination country would not be reported under this mechanism, and are beyond the scope of ASEL. For slaughter and feeder animals, land transport in the destination country is covered under the Exporter Supply Chain Assurance System (ESCAS) but this does not apply for breeder animals.

Reportable mortality levels for livestock exported by air should be monitored closely by the department and looked at again in the next review. The committee is of the view that subsequent reviews could provide an opportunity to assess mortalities in more detail given the recommendations for increased reporting. Future reviews may determine to remove this equivalence between reportable mortality levels for sea and air transport.

Recommendations

- 26) That the reportable level for mortalities for sheep, goats, camelids and deer should be set at 1%, or 3 animals, whichever is greater.
- 27) That the reportable level for mortalities for cattle and buffalo should be set at 0.5%, or 3 animals, whichever is greater.
- 28) That the question of mortality reporting be examined by the department in consultation with industry, in an attempt to cover the whole period that the animals are held in air export crates.

6.2 Contingency planning and reporting requirements

6.2.1 Current requirements

Contingency planning must be undertaken for each consignment exported by air transport. This planning must address how the following issues will be dealt with: unavailability of aircraft to be used for transport, mechanical breakdown and rejection of the consignment by the overseas market. There are currently no contingency planning requirements for euthanasia of livestock on-board the aircraft.

An end of journey report is required to be prepared and provided to the relevant Australian Government agency, in this case the Department of Agriculture, within 5 days of completion of discharge at final port of disembarkation and must contain the relevant details as outlined in ASEL v2.3, Appendix 6.2. This end of journey report currently only pertains to the air transport leg of the overall air export journey, and does not include any aspects of the road transport journey from the approved or registered premises to the airport of export.

6.2.2 Discussion in submissions and literature review

While many submitters felt that the current definition of notifiable incident is adequate – some offered some additions including: unavailability of aircraft, mechanical breakdown, severe turbulence, exceeding maximum water deprivation time or the disablement of the ventilation system – even if this does not have any adverse effect on animal health or welfare. The addition of the word ‘serious’ to clause (e) of the notifiable incident definition was proposed by 1 submitter, to ensure that notifiable incidents were not triggered by minor injuries such as an animal knocking its leg during unloading causing minor bruising.

It was noted in submissions that contingency planning, should also be required for any significant delays in any stage of the air export journey including during transit stops, air traffic or airport congestion.

It was also suggested by 1 submitter that as part of the contingency planning, a list of alternative non-hostile airports or premises with adequate facilities and trained personnel be prepared and provided to the captain.

One submission accepted the committee’s recommendations on end of journey reports, but advocated for the department to make better use of the collected data and make it readily available, once de-identified, for trade performance monitoring. Ammonia level monitoring during flight was suggested by another submission for inclusion in the end of journey report.

Further submissions recommended that end of journey reports should apply to the whole journey including land transport phases such as the land transport from the premises or property to the airport.

The literature review found no relevant studies or projects on the contingency reporting for livestock exported by air transport.

6.2.3 Committee views

The objective for collecting data other than mortality rates is to provide more detail about the welfare of animals on each consignment; to promote increased transparency, identify factors contributing to animal welfare outcomes, and enable improved risk mitigation for future consignments. Importantly, reporting should allow the early detection of subtle changes in animal or environmental conditions on-board and allow proactive decision-making and corrective action to reduce risk of poor welfare outcomes.

Reporting may initiate communications with the exporter or the department, provide support to personnel, and facilitate detailed analysis of any adverse event. Ideally, reports should include measures on animal welfare and morbidity and mortality data, including animal identification. This data should be analysed post-flight with an epidemiological approach. The analysis should involve discussion with the exporter representative and the department.

The committee accepted that there was opportunity for, and welfare benefits of, improved planning, monitoring and reporting of travelling livestock with particular attention to the total water deprivation time for livestock, and the potentially extended time animals remain crated. In addition, it was decided that more details regarding contingency planning were required.

Several submissions highlighted the potential risks to animal welfare when transport by air is delayed, before departure from Australia, during transit stops and when an aircraft is diverted. The committee viewed a loading of dairy heifers exported from Melbourne and witnessed the routine wait that is undertaken once animals are loaded into crates and before they are loaded into the aircraft (so that flight planning, load calculations and fuel requirements can be determined). The committee also consulted with key personnel involved and calculated the anticipated total journey times for animals on a range of journeys.

In order for the department to gain a better understanding of the total water deprivation time, its potential impact on animal welfare and at what point common delays occur, it is suggested that exporters should be required to provide more details on the travel time for each leg of the total journey.

The committee believes that the exporter should provide detailed estimates of journey times in the NOI and report on actual journey times in the end of journey report. This will allow points where repeated delays occur to be identified, and consequently lead to ways that extended times in crates, or water deprivation can be minimised improving animal welfare.

In addition, as the department and various stakeholders have agreed, the revised ASEL should move away from mortality as the main indicator of welfare. The committee recommends that more details on how the livestock travelled as well as the weather and climate experienced during the journey should be included in the end of journey report.

The committee suggests amending the end of journey report to include:

- time animals are removed from access to water (at the premises or property)
- time when first crated (first animal is loaded in a crate)
- time of flight(s) including any stopovers or transits
- time of arrival at final destination airport
- time when animals are released from the crate (time when the last animal is out)
- time when animals are first offered water
- weather details at each airport and if ventilation was provided during transit stops
- number, species, type of any animal that is affected by injury or ill-health, including the cause and any treatment
- general behaviour of the animals - standing, resting or other
- a description of the effect on animals of any episode of turbulence or alteration to ventilation whilst inside the aircraft.

There was some discussion in submissions about requiring the reporting of levels of ammonia on-board aircraft. Ammonia is a strong mucosal irritant and at harmful levels predisposes to respiratory disease due to inflammation of the respiratory tract, and adversely affects fodder intake. There is universal agreement in the literature review that high concentrations of ammonia gas are known to be deleterious for welfare and health.

There was no evidence available to the committee that showed excess ammonia levels have caused animal welfare issues during air transport (from Australia). The nature of aircraft

ventilation systems, coupled with typical feed and water curfews for livestock exported by air, will generally prevent ammonia reaching unacceptable levels.

The committee notes, however, that practical and consistent measurement of ammonia gas levels as a routine, regular measure is currently problematic. In particular, there is no technology currently available to provide the ongoing automated ammonia measurements that would be necessary to demonstrate compliance with such a standard, particularly to calculate a time-weighted average. Until more reliable methods for measuring ammonia can be deployed the committee is of the view that reporting of ammonia levels should not be mandatory rather, ammonia levels should be reported qualitatively in the end of journey report.

Given the likelihood that delays and diversions to aircraft may occur and sometimes will occur in foreign ports, and possibly in hot humid climates, the committee felt more detailed contingency planning was required for each consignment prior to approval.

As described by at least 1 submission, aircraft have limited endurance and therefore the holding of animals is limited, before the aircraft may need to land at the closest suitable airport. A clear plan of the livestock management in the event of a diversion from the intended destination should be provided by exporters. This may include details of how livestock could be offloaded for spelling, rest or watering as required or if animals cannot be unloaded, details of inspection and provision of water by bucket if required. An exporter's contingency plan must also demonstrate how a suitable person will attend unplanned stops to oversee the welfare of the animals as discussed in [Section 5.1.3](#).

Additional planning must include airports where access to, and use of, captive bolt or other firearm or veterinary drugs (sedation or barbiturate) for humane euthanasia is possible. Some airports and jurisdictions are known for strict animal biosecurity arrangements, which may forbid the unloading of animals from an aircraft, even for animal welfare grounds and these must be considered. It is suggested that unless the exporter can produce realistic contingency plans, the consignment should not be approved.

As discussed in [Section 4](#) of this report, in keeping with several views expressed in the submissions, the committee deemed that it was important to ensure animals were transported within acceptable water deprivation times, and not any longer than those established in the Land Transport Standards. The committee determined that a journey in which the maximum water deprivation period is exceeded should be a notifiable incident. The additional reporting requirement will assist the department in monitoring this element of the air export journey. It was also noted that within the 1 consignment there may be varying upper limits for maximum water deprivation times if the consignment includes animals in the last third of pregnancy.

Recommendations

- 29) That the standards require that each shipment has a contingency plan for the management of livestock in the event the aircraft is diverted and forced to land at a location different from the intended transit stop(s) or destination. An exporter's contingency plan must demonstrate how a suitable person will attend unplanned stops to oversee the welfare of the animals.

- 30) That the standards require a contingency plan for euthanasia for any animal where it is deemed as required either on-board the aircraft if livestock are accessible and it is safe to do so, or as soon as possible after unloading from the aircraft.
- 31) That the requirements for the end of journey report be updated as per [Appendix E](#) of this report to include more detailed animal welfare and environmental monitoring and to cover more aspects of the air export journey.
- 32) That the standards include a notifiable incident if the maximum water deprivation time is exceeded. If maximum water deprivation times are exceeded, exporters should notify the department as soon as possible. The report should include details of any mitigating measures that have been employed to address the issue.

7 General

7.1 General

7.1.1 Current requirements

The IATA Regulations were considered in the development of ASEL v2.3 and many provisions within Standard 6 are consistent with them.

7.1.2 Discussion in submissions and literature review

It was suggested in submissions that ASEL should reference international standards such as the IATA Regulations and the OIE Code, rather than reproduce these international standards. It was also suggested that where the ASEL provides further regulation over that of international standards, then the ASEL should prevail.

7.1.3 Committee views

The committee considered that referencing international standards in ASEL was good practice. As the IATA Regulations are updated annually on the recommendations of an expert group, the committee is of the opinion that specific references to particular regulations would not be appropriate. A general compliance clause would suffice. Additionally, the department should provide exporters with a notice of any changes that occur on an annual basis, through an Export Advisory Notice.

The committee noted that there are times when international regulations differed from ASEL. It was suggested that standards in the IATA Regulations should apply, unless the ASEL provided for over and above the IATA Regulations requirements in which case ASEL should apply.

Recommendations

- 33) That the standards include a provision that the IATA Regulations, as amended and in force from time to time, shall apply to the export of livestock by air from Australia, unless there is a variance with the ASEL, in which case the ASEL should apply.
- 34) That the department releases an Export Advisory Notice when the IATA Regulations are amended.

8 Management plans

8.1 Management plans

Throughout the report the committee has recommended the use of management plans to address additional risks faced by certain classes of livestock.

8.1.1 Current requirements

All livestock exporters need an approved arrangement to export livestock from Australia. Since 1 January 2017, under the *Export Control (Animals) Order 2004*, the department cannot approve Notices of Intention (NOI) for exports or issue export permits and health certificates for livestock to exporters who do not have an approved arrangement (unless a small and infrequent exporter exemption has been granted).

An approved arrangement is an agreement between the department and a livestock exporter that allows for a streamlined export certification process. The purpose of the approved arrangement is to describe the operations which, when correctly applied by a livestock export business (the exporter), will effectively manage the preparation and certification of livestock exported from Australia. This approach is consistent with other export commodity approved arrangements.

Where an exporter wants to undertake certain activities, such as exporting heavy cattle, they need to include a management plan to cover this activity in their approved arrangement.

Once these management plans are approved, any consignment that requires a management plan must invoke the relevant management plan in the consignment specific export plan (CSEP) and include the relevant management plan(s) on the application for Export Permit and Health Certificate.

Exporters must have management plans of these types approved as part of their approved arrangement before they submit a NOI where the relevant management plan is required.

8.1.2 Discussion in submissions and literature review

Management plans have been considered by submissions heavily in earlier sections of the report. Further to earlier comments, 1 submission suggested management plans should be developed in consultation with a veterinarian and a veterinary declaration submitted for auditing purposes. Another submission indicated that if animals such as vulnerable classes of livestock were not allowed to be exported, then management plans were not needed as all other requirements would be addressed in ASEL.

The literature review found no relevant studies or projects on management plans for livestock exported by air transport.

8.1.3 Committee views

The committee has recommended that ASEL is updated to require the use of management plans for certain activities when exporting livestock by air. The management plans should detail how the exporter intends to manage the heightened risk of animal welfare issues associated with the:

- export of young animals

- sourcing and export of miniature breeds and other livestock that do not meet the minimum liveweight requirements
- export of livestock during the last third of pregnancy
- export of livestock that have recently given birth
- export of livestock with young at foot
- penning arrangements for camels over 300kg liveweight
- management of total water deprivation time during the air export journey.

8.1.4 General inclusions in a management plan

A management plan must include details of how the exporter will manage the sourcing and transport of these animals, in particular:

- The age, weight and breed (where applicable) of the animals covered by the plan
- Induction and sourcing activities – including weighing, inspection and segregation (if required)
- Animal health and treatments - including additional treatments or veterinary requirements
- Feeding and water requirements – details of any feeding programs/regimes
- Loading and penning arrangements – detail the process for selecting and stocking appropriate crates, including segregation where required
- Monitoring and inspections during the air transport journey – detail how animal welfare will be monitored throughout the journey.

8.1.5 Total water deprivation time

A management plan for the total water deprivation time during the air export journey must include details of how the exporter will manage the water deprivation time for animals, in particular:

- Routine curfew arrangements
- Expected journey time – including from the premises to the airport, time spent at the airport prior to and including loading, total flight time and expected time until the animals will be uncrated and offered water at the destination.
- Expected total water deprivation time (in hours)
- Provision of water during delays or transit stops
- Contingency arrangements if the maximum water deprivation time is exceeded – including details of how animals can be provided water enroute or during transit

9 Economic impacts

The committee's terms of reference require it to balance the implications for animal welfare with the practicalities of livestock management, compliance costs and industry sustainability. This chapter summarises the committee's assessment of the impact its recommendations may have on industry sustainability and regulatory compliance costs.

The likely impact of the committee's recommendations is summarised in Table 14. Of the 34 recommendations, there are only 2 that the committee considers have the potential to have anything more than a minimal impact: [recommendation 19](#) changing the rounding point to n.7; and [recommendation 23](#) requiring an attendant to accompany livestock on charter and freighter aircraft.

As noted in [chapter 3](#), the impact of the proposed change in the rounding point from n.5 to n.7 varies depending on the weight of the animals. If animals of the optimal weights are exported (i.e. the calculation per crate is less than n.5 or greater than n.7), then the change to the rounding point will have no economic impact. Only if animals are all of a weight that results in a number between n.5 and n.7 would the cost impact occur. Exporters would be able to avoid this situation by sourcing and preparing animals of optimal weights.

It is also relevant to note the performance limitations of aircraft can also result in reduced numbers of animals from what ASEL may permit. For example, at 300kg ASEL allows 0.84 square metres for cattle. In a 6.3 square metre crate, this translates to $6.3/0.84 = 7.50$ animals, which can be rounded up to 8 animals per crate. A B747-400F can accommodate 39 crates, so in theory 312 animals can be loaded. Assuming each crate weighs about 650kg before animals are loaded into it, then the weight of each loaded crate is 3,050kg; and 39 crates weigh 118,950kg. However, the maximum payload of a B747-400F is about 112,000kg and at this payload has a range of 8,250km. So operational requirements mean that 6950kg, or 24 animals could not be loaded from the simple ASEL calculation. For flights beyond 8,250km, more cattle would have to be left behind as additional fuel would be required (for example Melbourne to Xian in China is more than 8,800km).

So while the change from n.5 to n.7 does result in a theoretical reduction in stocking density, its practical cost impost is unlikely to be as great as it may initially seem. Either aircraft limitations will make maximum ASEL loads impossible; or the exporter can modify its practices to ensure crates do not fall into the n.5 to n.7 bracket.

The cost of an attendant to accompany charter flights is likely to be in the range of \$4,000 to \$5,000 when wages, accommodation, return air fare and incidentals are included. For a full charter aircraft, this is likely to be a relatively modest overall cost impost when compared to the total cost of buying the animals, preparing them for export, getting them to the airport and the cost of the aircraft charter. Assuming a B747 load of 200 cattle, then the additional cost is \$20 to \$25 per head. Given the fact that a number of exporters are already sending an attendant on flights, and 1 industry organisation has now mandated this for its members, the additional cost is considered to be manageable for the industry.

In addition, as discussed in [chapter 5](#), the committee reached the view that consignments on freighter aircraft may not require an attendant and that the department be given the power to

determine on a case-by-case basis whether 1 is required. Should such a dispensation be granted by the department, it would eliminate the regulatory compliance cost.

Table 14 Summary of cost impacts arising from recommendations

Recommendation number	Possible economic impact
1	No impact. Minor change from current requirements.
2	No impact. Export of deer under 6 months old is currently prohibited. This change will broaden options for exporters.
3	No impact. This change will broaden options for exporters.
4	No impact.
5	Minor impact. Minor change from current requirements.
6	Minor impact. Very few deer are exported by air (none in 2017 or 2018) and the selection process can accommodate this exclusion easily.
7	Minor impact for slaughter animals. A positive impact for breeder animals by extending the period of validity of a pregnancy test.
8	Minor impact.
9	No impact on non-farmed goats as this requirement already exists. A positive impact for farmed goats as they qualify automatically for export by virtue of their domesticated status.
10	A modest impact as buffalo are not currently subject to this requirement. However, few buffalo are exported by air (10 in the last 3 years) and so the total impact is low.
11	A positive impact. This change creates a more flexible regulatory regime.
12	A minor impact. The current standard requires fit to export certification for animals that have given birth in the last 2 days before export.
13	Minimal impact as it brings the standard into line with the domestic animal welfare standards that exporters will already be complying with.
14	Minimal impact as it brings the standard into line with the Land Transport Standard that exporters will already be complying with.
15	Minimal impact as occurrence is likely to be low, and in instances where animals are returned from an airport for 1 reason or another, a rest period is being given. The recommendation codifies existing best practice.
16	No impact. Majority of exporters are already applying these space allowances. The recommendation remedies a known defect in the existing regulation.
17	Minimal impact. Very few camels are exported, and even fewer in this weight category. Consistent with IATA Regulations for camels over this weight to have special crates.
18	Minimal impact. Exporters already pen animals in accordance with species, class and weight. The recommendation is consistent with the IATA Regulations and OIE Code.
19	Variable impact (see discussion in text). The most significant potential impacts can be avoided through sourcing animals of optimal weights or mixing animals to achieve the required crate average. Aircraft performance specifications also mean maximum stocking densities cannot be achieved now.
20	Minor impact. Exporters already know this information but will now be required to include it in export applications and have their analysis checked by the department. For longer journeys, there may be an additional cost in organising water at an appropriate point to meet the requirement.
21	Minor impact.
22	Variable impact. A number of exporters already meet this requirement. For those that do not, it will be sufficient to have a locally engaged person undertake the task. Likely to be less than 1% of the total export cost base.

Recommendation number	Possible economic impact
23	Manageable impact (see discussion in text). Some exporters already meet this requirement. Cost in the region of \$4000–\$5000 per shipment to cover wages, return air fare, hotel accommodation and incidentals.
24	Minimal impact. The additional requirement for checking livestock as soon as possible after landing can be done by either the attendant accompanying a charter flight (recommendation 23) or the competent attendant on arrival (recommendation 22). The 1 person could do both (that is the attendant who accompanies the flight could also be the attendant checking the livestock during unloading from the aircraft).
25	No impact at this stage. May result in a cost impact if upgraded facilities are installed.
26	No impact.
27	No impact.
28	No impact.
29	Minimal impact. A contingency plan is already required under ASEL. The attendant required on charter aircraft will be able to fulfil this role. For livestock on freighter and passenger aircraft, the exporter will need to be able to demonstrate an arrangement with an appropriate person in possible alternate airports enroute, with a consequent cost if the person is needed in an emergency.
30	Minimal impact.
31	Modest additional cost arising from completing more items in the end of journey report.
32	No significant impact arising from the reporting requirement.
33	No impact as this applies now.
34	No impact on exporters. Minor additional cost to the department in drafting and issuing an EAN.

The committee is of the view that none of the recommendations contained in its report would increase the regulatory compliance costs significantly nor jeopardise the sustainability of the industry.

10 Definitions

Air export journey covers the period from the time the first animal is loaded into a crate for transport by air, until the time the last animal is unloaded from the aircraft at the final destination airport.

Approved premises is a place approved in accordance with the Export Control (Animals) Order 2004 for the preparation, quarantine or isolation of livestock for export by air.

Competent pregnancy tester a person permitted under a relevant state or territory law to conduct pregnancy tests in livestock. Competent pregnancy testers may only diagnose pregnancy for feeder/slaughter cattle or buffalo by manual palpation and are not approved to use ultrasound diagnoses or the IDEXX pregnancy test. They cannot complete pregnancy testing of breeder or buffalo consignments for any market.

Charter aircraft is an aircraft on a non-scheduled operation dedicated to the export of livestock. It may have consignments from 1 or more exporters.

Emaciated or over-fat body condition Livestock is in an emaciated or over-fat body condition if it is assessed by a competent person against the corresponding species scoring system within [Appendix A](#), as having the following body scores:

Species	Body condition		
	Emaciated (inclusive)	Fit to export (inclusive)	Over-fat (inclusive)
Cattle	Less than 2	2 or more, less than 5	5 or more
Dairy cattle	Less than 3.5	3.5 or more, less than 5.5	5.5 or more
Buffalo	Less than 2	2 or more, less than 5	5 or more
All other livestock	Less than 2	2 or more, less than 4	4 or more

Freighter aircraft is an aircraft on either a scheduled or non-scheduled freight service carrying goods in addition to livestock.

Management plan details how the exporter will manage the risks associated with undertaking certain activities. Exporters must have management plans approved as part of their approved arrangement before they submit a notice of intention to export where the relevant management plan is required.

Mixed cargo a shipment made up of 2 or more different types of goods. In this standard, a mixed consignment refers to a shipment that includes livestock and other good(s).

Notifiable incident with regard to export of livestock by air includes, but is not limited to:

- a) loss of aircraft;
- b) disablement of ventilation systems on an aircraft carrying livestock causing a serious adverse effect on animal health and welfare;
- c) rejection of livestock at an overseas airport;
- d) a mortality rate equal to or greater than the reportable level;
- e) any other incident that has an adverse effect on animal health and welfare; or
- f) the maximum water deprivation times are exceeded for the air export journey.

Registered Premises Premises registered for holding and assembling livestock for export in accordance with the *Export Control (Animals) Order 2004*.

Reportable level in respect of a species, means the percentage listed or 3 animals, whichever is the greater number of animals:

- a) sheep and goats: 1%;
- b) cattle and buffalo: 0.5%;
- c) camelids: 1%;
- d) deer: 1%.

Valid pregnancy test a valid pregnancy test is that which has been completed in accordance with the species pregnancy testing requirements within [Appendix B](#) of this standard. For the purposes of pregnancy testing requirements where required within 30 days of export, the day that the animal is pregnancy tested is taken to be day zero (0). For example, if a heifer is pregnancy tested on 1 July, day zero is 1 July and the day of loading must be no later than 31 July to meet the valid pregnancy test requirements of testing during the 30 day period.

Water deprivation time the time that animals can be deprived of access to adequate water of a quality to maintain good health and welfare. Water deprivation time is the total continuous period of water deprivation, starting when all animals last had access to water. The Land Transport Standards uses the term time 'off water' to describe this.

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Appendix A: Body condition score tables

Table A1 Cattle body condition scoring

Score	Traditional muscle score equivalent	Traditional fat score equivalent	Description
0	E	0	Severely emaciated
1	D	0	The individual bones are sharp to the touch, with no fat at the head of the tail. Hip bones and ribs are prominent.
2	B-E	1	The individual bones can be felt easily, but feel rounded rather than sharp. There is some tissue cover around the tail head. Individual ribs are no longer visually obvious.
3	A-E	2	The short ribs can be felt only with firm thumb pressure. Areas either side of the tail head have fat cover which can be felt easily.
4	A-E	3	The ribs cannot be felt and fat cover around the tail head is easily seen as slight mounds, soft to touch. Folds of fat are beginning to develop over the ribs and thighs.
5	A-E	4-6	The bone structure of the animal is no longer noticeable and the tail head is almost completely buried in fatty tissue.

Figure A1 How to apply body condition scores for beef cattle

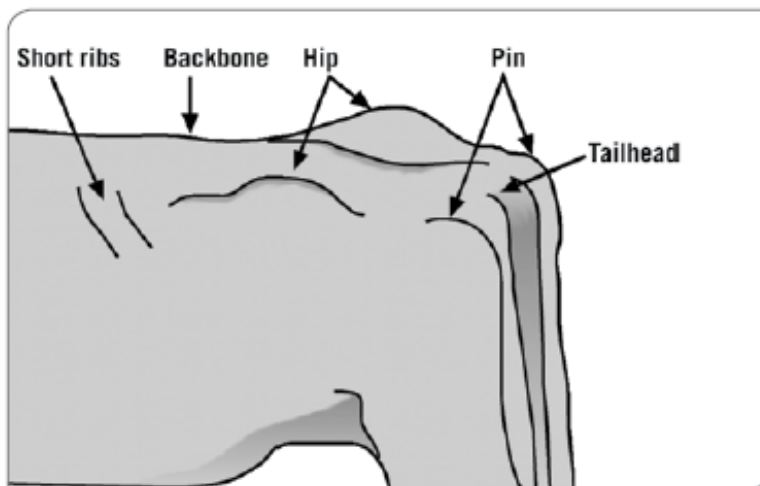
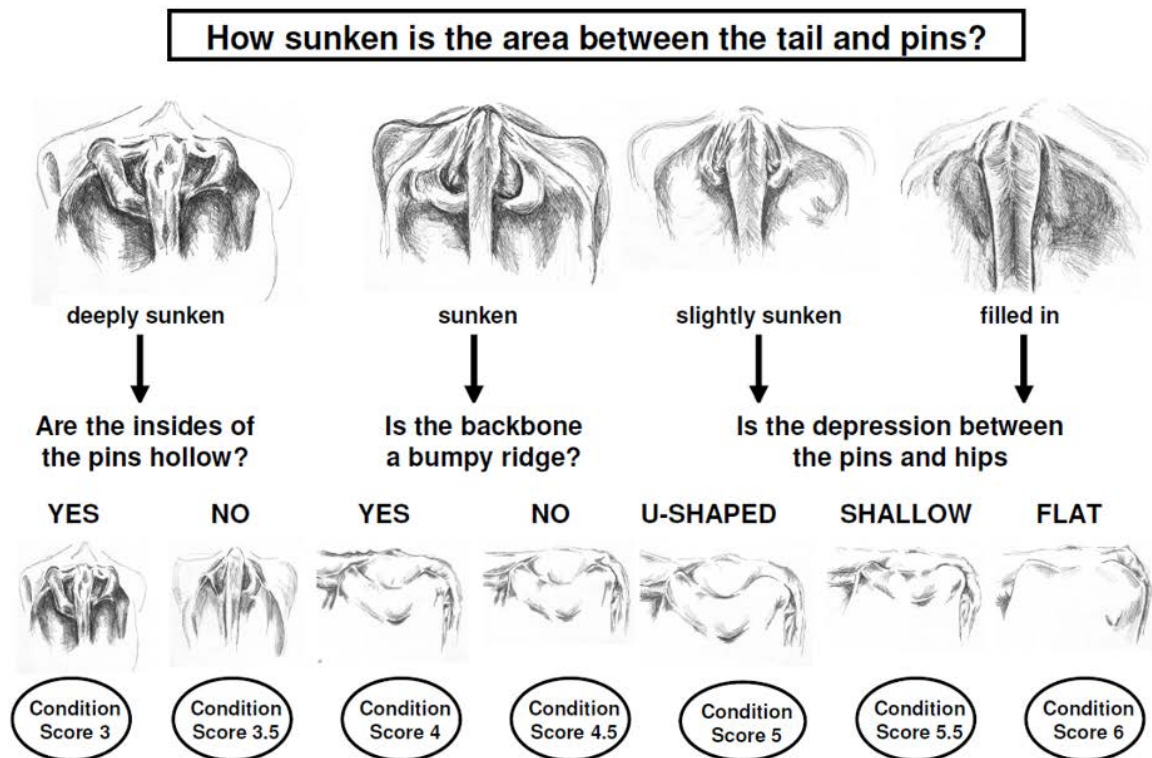











Figure A2 Dairy cattle body condition scoring








Source: Tropical dairy farming:feeding management for small holder dairy farmers in the humid tropics
<http://www.publish.csiro.au/ebook/chapter/SA0501209>

Table A2 Buffalo body condition scoring

Score (1-5) Export (suggested)	Optional score [1-9] (production/ research)	Description	P8 fat mm thickness (1-5) [1-9]	Loin surface	Illustration of vertical section of loin between spinous and transverse processes
1	1	Emaciated; very weak— extreme muscle wastage. All bones highly visible. Skin 'draped' over skeleton. Unsteady gait.	0	Severely concave	
–	2	Very lean; becoming quite angular, concave around most muscle groups including legs with muscle depletion evident.	0	Very concave	
2	3	Lean; short ribs visible, hook and pin bones still prominent. Can easily count all ribs. Some muscle depletion. No subcutaneous fat visible or palpable.	0	Moderate ly concave	
–	4	Backward store; tail head still prominent with hollows to pins. Ribs visible only at top and rear.	[1-2]	Slightly concave	
3	5	Store; (average) good muscle definition, with fat starting to be deposited, rib outlines disappearing, hook and pin bones still defined.	(1-4) [3-4]	Level, even slope	
–	6	Forward store; hook and pin bones becoming more rounded. Pin to stifle leg straight to slightly convex.	[5-7]	Slightly convex	
4	7	Prime; quite even and smooth over whole backline. Muscling becoming more convex due to fat deposition.	(5-35) [8-14]	Moderate ly convex	
–	8	Fat; well-rounded all over all bone. Some unevenness of fat deposits appearing around rump area.	[15-35]	Very convex	
5	9	Overfat; usually only mature cows can achieve this condition. Bulbous fat deposits both sides of tail head. Pin and hook bones not discernible.	(>36) [>36]	Severely convex crease/di p along spine	

Source: Northern Territory Buffalo Association

Table A3 Sheep body condition scoring

Score	Backbone	Short ribs	Illustration
1	The bones form a sharp narrow ridge. Each vertebra can be easily felt as a bone under the skin. There is only a very small eye muscle. The sheep is quite thin (virtually unsaleable).	The ends of the short ribs are very obvious. It is easy to feel the squarish shape of the ends. Using fingers spread 1cm apart, it feels like the fingernail under the skin with practically no covering.	<p>Condition Score 1</p> 
2	The bones form a narrow ridge but the points are rounded with muscle. It is easy to press between each bone. There is a reasonable eye muscle. Store condition – ideal for wethers and lean meat.	The ends of the short ribs are rounded but it is easy to press between them. Using fingers spread 0.5cm apart, the ends feel rounded like finger ends. They are covered with flesh but it is easy to press under and between them.	<p>Condition Score 2</p> 
3	The vertebrae are only slightly elevated above a full eye muscle. It is possible to feel each rounded bone but not to press between them. Forward store condition ideal for most lamb markets now. No excess fat.	The ends of the short ribs are well rounded and filled in with muscle. Using 4 fingers pressed tightly together, it is possible to feel the rounded ends but not between them. They are well covered and filled in with muscle.	<p>Condition Score 3</p> 
4	It is possible to feel most vertebrae with pressure. The back bone is a smooth slightly raised ridge above full eye muscles and the skin floats over it.	It is only possible to feel or sense 1 or 2 short ribs and only possible to press under them with difficulty. It feels like the side of the palm, where maybe one end can just be sensed.	<p>Condition Score 4</p> 
5	The spine may only be felt (if at all) by pressing down firmly between the fat covered eye muscles. A bustle of fat may appear over the tail (wasteful and uneconomic).	It is virtually impossible to feel under the ends as the triangle formed by the long ribs and hip bone is filled with meat and fat. The short rib ends cannot be felt.	<p>Condition Score 5</p> 

Source: Lifetime Wool.

Table A4 Goat body condition scoring

Body score	GR site tissue depth	Long ribs (A)	Short ribs (B)	Backbone (C)	Eye muscle (D)
1	1 to 3mm	Individual ribs can be felt very easily; cannot feel any tissues over the ribs.	Short ribs are prominent; it is easy to feel between them. The muscle mass extends two-thirds or less of the way along them.	Bones are raised and sharp; it is easy to feel between them. The muscle mass extends two-thirds or less of the way along them.	Feels noticeably dished.
2	4 to 6mm	Individual ribs can be felt very easily but	Ends of short ribs feel square; it is easy to feel between them. The	Bones are slightly raised and can be easily felt, with	Feels straight or slightly dished.

Body score	GR site tissue depth	Long ribs (A)	Short ribs (B)	Backbone (C)	Eye muscle (D)
		slight amount of tissue is present.	muscle mass extends to the end of the short ribs.	noticeable dishing between them.	
3	7 to 9mm	Individual ribs can be felt easily but some tissue is present.	End of short ribs are rounded; it is still possible to feel between them.	Bones are raised and the ends are rounded; it is still possible to feel between them.	Feels slightly rounded.
4	10 to 12mm	Individual ribs can still be felt but tissue is prominent.	Ends of short ribs are rounded; it may be possible to press between them with pressure.	Bones are slightly raised; it is possible to feel them but not between them.	Feels well rounded.
5	Over 12mm	Individual ribs can be felt or just felt; tissue is very prominent and may be fluid.	None or only 1 or 2 bone ends nearest the rib cage may be felt. It is not possible to press between them.	Some bone ends may still be felt or backbone may be recessed in fat and difficult to feel. It is not possible to feel between bone ends.	Feels very well rounded.

To determine the condition score, feel the grid reference (GR) site of the goat. This point is located 110mm from the backline along the second-last long rib. The condition score relates to the tissue depth (in mm) at the GR site. Table A4 provides guidance on what to feel for when condition scoring. As the table indicates, the live condition scores assigned in Australia are from 1 to 5. Refer to Figure A3 to locate the positions on the goat indicated by A, B, C and D in the first row of Table A4.

Figure A3 How to apply body condition score for goats

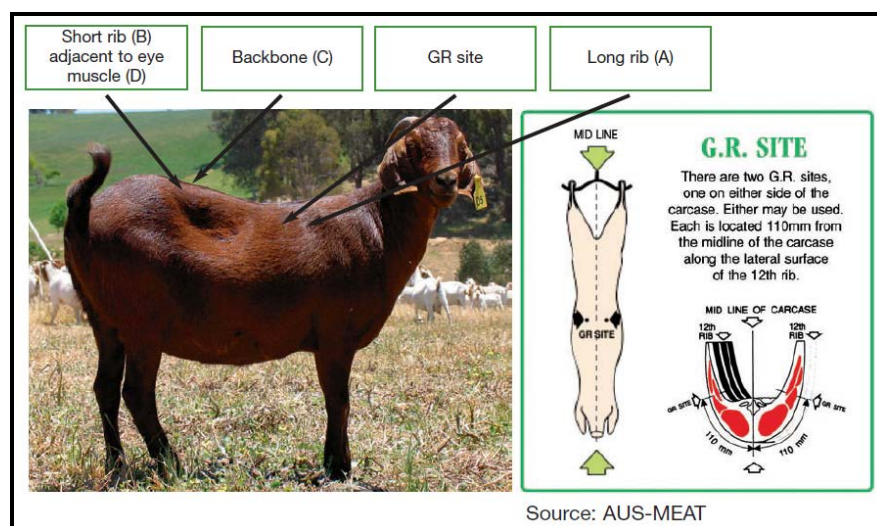


Table A5 Alpaca body condition scoring

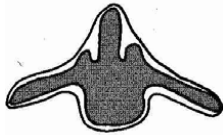
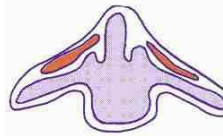
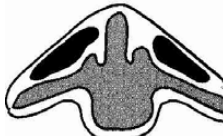

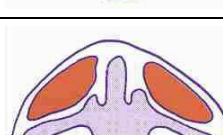










Score	Description	Illustration
1	Severely concave between spine and ribs. The backbone is very noticeable, ribs are clearly felt and brisket shows no fat.	
2	Slightly concave between spine and ribs. You can feel backbone, ribs are noticeable and brisket is firm.	
3	Neither concave nor convex between spine and ribs. You can feel the backbone, but it does stand out and you can just feel the ribs and the brisket.	
4	Slightly convex between spine and ribs. You can feel the backbone, but it does not stand out and you can just feel the ribs and the brisket.	
5	Severely convex between spine and ribs, the top of the back feels flat. You cannot feel backbone or ribs, brisket wobbles when touched.	

Figure A4 How to apply body condition score for alpacas

An example of how to body score an alpaca by placing hand on the backbone, just forward of the pelvic area (or toward the last of the ribs).

Source: The Australian Alpaca Association

Table A6 Camel body condition scoring

Score	Description	Illustration
1	<p>Little or no fat in the hump sac; hump hairy and may be leaning to 1 side.</p> <p>Ishium/tuber coxae/shoulder/spinous and transverse processes of vertebrae very prominent</p> <p>Recto-genital zone very deep</p> <p>Hollow of flank very visible</p>	  <p>Note 1</p>
2	<p>Hump with moderate development rising 5% higher than chest depth, but may also be leaning to 1 side.</p> <p>Ishium/tuber coxae/shoulder/spinous and transverse processes of vertebrae prominent</p> <p>Recto-genital zone deep</p> <p>Hollow of flank visible</p>	  <p>2</p>
3	<p>Hump with good development and rising to 10% higher than chest depth. Hump is still sculptured inwards on both sides and still fits over the chest and abdominal area.</p> <p>Ishium/tuber coxae/shoulder/spinous and transverse processes of vertebrae slightly prominent</p> <p>Recto-genital zone shallow</p> <p>Hollow of flank not visible</p>	  <p>3</p>
4	<p>Hump fully developed and rising to 15% higher than chest depth. Hump rounded outwards on both sides and runs from the shoulder to the rump.</p> <p>Ishium/tuber coxae/shoulder/spinous and transverse processes of vertebrae not visible</p> <p>Recto-genital zone full of fat</p> <p>Hollow of flank not visible</p>	  <p>4</p>
5	<p>Hump overextended and rising more than 15% higher than chest, or so full that it is rounded on the sides like a semicircle.</p> <p>Ishium/tuber coxae/shoulder/spinous and transverse processes of vertebrae covered in fat</p> <p>Recto-genital zone bulging</p> <p>Ribs hollow of flank not visible</p>	  <p>5</p>

Source: Descriptive language for live camels. 2001. Central Australian Camel Industry Association

Table A7 Deer body condition scoring

Score	Description	Pelvis, ribs and spine	Rump area
1	Emaciated—no fat cover	Prominent	Concave
2	Lean—minimal fat cover	Prominent but appear rounded rather than sharp	Slightly concave
3	Prime—ideal fat cover	Not readily distinguished	Flat
4	Fat—fat (some trimming necessary)	Pelvis rounded, spine covered by fat	Rounded
5	Over-fat—over-fat (excessive trimming required)	Pelvis concealed by fat, spine hard to palpate	Very convex

Source: Deer Industry Association of Australia

Appendix B: Pregnancy testing requirements for livestock exported by air

Pregnancy testing for breeder cattle or buffalo

A valid pregnancy test for breeder cattle or buffalo must:

- a) be evidenced by written certification by the person carrying out the test that the animal is no more than 250 days pregnant at the scheduled date of departure.

NOTE: For consignments where an accredited PREgCHECK® tester is required, the exporter must ensure the name of the accredited tester, their accreditation number and a statement of their accreditation is provided on the pregnancy declaration for the consignment.

- b) That the veterinarian may base this certification on assessment of the animals by a method other than manual palpation if the veterinarian:
 - i) is accredited under the PREgCHECK® Scheme, and
 - ii) determines that the cattle or buffalo are too small to be manually palpated safely.

Pregnancy testing for feeder or slaughter cattle or buffalo

A valid pregnancy test for feeder or slaughter cattle or buffalo must:

- a) have been carried out during the 30 day period before export, unless otherwise agreed by the relevant Australian Government agency, with that agreement to be provided only where necessitated by circumstances outside the control of the exporter and where the exporter can demonstrate it will not impact on animal welfare
- b) be carried out by a registered veterinarian
- c) be evidenced by written certification by the person carrying out the test, that the animal is not detectably pregnant.

Pregnancy testing for camelids

A valid pregnancy test for camelids must:

- a) except in the case of breeders, have been carried out during the 30 day period before export, unless otherwise agreed by the relevant Australian Government agency, with that agreement to be provided only where necessitated by circumstances outside the control of the exporter and where the exporter can demonstrate it will not impact on animal welfare
- b) have been carried out by ultrasound, or in the case of breeders by ultrasound foetal measurement
- c) be carried out by a registered veterinarian with demonstrable current experience in camelid pregnancy diagnosis
- d) be evidenced by written certification by the person carrying out the test, that the animal is not detectably pregnant, or in the case of breeders, not more than 250 days pregnant.

Pregnancy testing for breeder goats, sheep and deer

A valid pregnancy test for breeder goats, sheep or deer must:

- a) have been carried out by ultrasound, or in the case of breeders by ultrasound foetal measurement
- b) be carried out by a person able to demonstrate a suitable level of experience and skill
- c) be evidenced by written certification by the person carrying out the test that the animal is not more than the specified number of days pregnant at the scheduled date of departure in Table B1.

Pregnancy testing for feeder or slaughter goats and sheep

A valid pregnancy test for feeder or slaughter goats and sheep must:

- a) have been carried out during the 30 day period before export, unless otherwise agreed by the relevant Australian Government agency, with that agreement to be provided only where necessitated by circumstances outside the control of the exporter and where the exporter can demonstrate it will not impact on animal welfare
- b) have been carried out by ultrasound, or in the case of breeders by ultrasound foetal measurement
- c) be carried out by a person able to demonstrate a suitable level of experience and skill
- d) be evidenced by written certification by the person carrying out the test, that the animal is not detectably pregnant.

Table B1 Maximum days gestation for breeder livestock

Livestock	Maximum days gestation
Cattle and buffalo	250
Deer (axis, fallow, sika)	170
Deer (rusa, red, reindeer)	185
Sheep	115
Goats	115
Camelids	250

Appendix C: Pen space allowances for alpacas

The following pen space allowances have been taken from the stocking densities specified for alpacas in the Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock.

Table C1 Pen space allowance for alpacas

Mean liveweight (kg)	Minimum floor area (m ² /head)
20	0.4
30	0.5
40	0.6
50	0.7
60	0.8
80	1.0

1. Alpacas must have enough space to be able to cush during transport, that is sit with their legs folded underneath them.

2. The estimated area for an alpaca to cush is approximately 0.55m² for a 40–50kg alpaca.

Appendix D: Maximum water deprivation times

The following maximum water deprivation times have been taken from the Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock. The maximum water deprivation time begins at the time animals are curfewed at the farm and covers the whole journey, until the point animals are provided with water again.

Table D1 Maximum water deprivation time

Species	Class	Maximum water deprivation time
Alpacas	over 12 months	24 hours
	6 to 12 months, or up to last third of pregnancy	8 hours
	in the last third of pregnancy; lactating with young at foot; or cria up to 6 months	4 hours
Buffalo (note: Buffalo must not be held off water prior to transport, no curfew is permissible)	over 6 months; or up to second third of pregnancy	36 hours
	1 to 6 months; in last third of pregnancy; or lactating with young at foot	24 hours
Camels	over 6 months; or up to second third of pregnancy	48 hours
	1 to 6 months; in second third of pregnancy; or lactating with young at foot	24 hours
Cattle	over 6 months	48 hours
	1 to 6 months; lactating with young at foot; or in the last third of pregnancy	24 hours
Deer	over 6 months	48 hours
	1 to 6 months	28 hours
	in last third of pregnancy	24 hours
Goats	over 6 months	48 hours
	1 to 6 months	28 hours
	Last third of pregnancy	24 hours
Sheep	over 4 months	48 hours
	1 to 4 months	28 hours
	in the last third of pregnancy	24 hours

Appendix E: Air export journey report

This report must provide a general overview of the air export journey, with mention of any specific issues relevant to the health and welfare of the livestock, and must include the following information:

- 1) Approved premises/property
- 2) Departure airport(s); Total loaded, by species
- 3) Aircraft type(s) and airline(s)
- 4) Location of livestock on aircraft (main hold/belly hold); Charter, freighter or passenger aircraft; Attendant on board
- 5) Flight number(s); Date and departure time (of flight)

Table E1 Water deprivation time

Details	Details and time (local)	Cumulative time off water (hours)
Curfew time – animals are removed from access to water (at premises or property)	For example curfew began at xx:xx.	0
Loading time – time that the loading of crates began	For example loading began at xx:xx	4
Total flight(s) time—including any stopovers or transits	For example flight departed at xx:xx	15
Time when animals are first offered water	For example flight departed at xx:xx flight arrived at xx:xx	19
TOTAL water deprivation time	-	22

- 6) Transit stops
 - a) Feed and water
 - b) Access to animals
 - c) Maintenance issues
 - d) Weather conditions
 - e) Ventilation
- 7) Flight conditions
 - a) Weather conditions
 - b) Temperature (where the livestock are kept)
- 8) Health and welfare of livestock
 - a) Number of livestock born during the journey

- b) Number of abortions
 - c) Number of mortalities and details of mortality/cause of death
 - d) Number, species of any animal that is affected by injury or ill health, including cause and any treatment.
 - e) General behaviour of animals in flight (standing, resting, etc)
 - f) General demeanour of animals: Alert/active/lethargic/anxious/dull or other
 - g) Effect on animals of any turbulence or alteration to ventilation inside aircraft.
- 9) Discharge airport(s)
- a) Date and arrive time (of flight)
 - b) comments on discharge operations at airport and/or farm

Appendix F: Consultation report

Overview

A Technical Advisory Committee (the committee) was appointed by the Department of Agriculture (the department) to review the standards. The committee's membership structure was designed to ensure a breadth of skills and expertise relevant to the standards in order to facilitate equitable consideration of issues and sound advice to the department.

The committee was chaired by Mr Steve McCutcheon and comprised:

- Dr Teresa Collins, Animal Health and Welfare Expert
- Dr Hugh Millar, Animal Health and Welfare Expert
- Mr Russell Phillips, Regulation Specialist
- Mr Kevin Shiell, Livestock Export Industry Expert

The committee consulted widely to ensure that they heard views from the diversity of stakeholders affected by any regulatory changes. The committee was also aware of the high level of community interest in the welfare of exported livestock. The review process included 2 rounds of public consultation where written submissions were sought. Key steps in the process are outlined in Table F1.

The committee also engaged with a reference group made up of representatives from bodies with a direct interest in the livestock export industry. The role of the reference group was to provide the committee with a resource to discuss technical and practical aspects of the review, drawing on their experience with export conditions relevant to Australian livestock species and export processes. Members included: RSPCA; Australian Livestock Exporters' Council; Australian Veterinary Association; Cattle Council of Australia; Sheep Producers Australia; Australian Dairy Farmers; Australian Alpaca Association; Australian Buffalo Industry Council; Australian Camel Industry Association Inc.; Deer Industry Association of Australia; Goat Industry Council of Australia; and LiveAir.

Table F1 Public consultation milestones

Date	Activity
10 April 2019	Meeting with Reference Group
11 April 2019	Public consultation on Stage 1 – Issues Paper opens
16 May 2019	Public consultation on Stage 1 closed – 12 Submission received
18 June 2019	Meeting with Reference Group
20 June 2019	Public consultation on Stage 2 – Draft Report
18 July 2019	Public consultation on Stage 2 closed – 12 submissions received
6 August 2019	Meeting with Reference Group

Issues Paper

Stage 1 of the air review commenced in April 2019 with the release of an issues paper for public consultation. The issues paper posed a series of questions regarding key issues identified in Stage 1 of the ASEL review in early 2018, as well as through consultation the committee held with key stakeholders in early 2019.

The consultation opportunity was advertised on the department's homepage, live animal export page and *Have your Say* site. A departmental media statement was released. Alerts and reminders were issued via social media platforms such as Twitter. The committee also made direct contact with members of the stakeholder reference group, AAVs, exporters, registered premises owners and state and territory governments.

Consultation closed on 16 May 2019. The committee received 12 submissions from industry, animal welfare organisations and government departments. Those submitters who agreed to be identified are:

- Agriculture Victoria
- Australian Alpaca Association
- Australian Livestock and Rural Transporter's Association
- Australian Livestock Exporters' Council
- Australian Veterinary Association
- Cattle Council of Australia
- Deer Industry Association of Australia
- LiveCorp
- RSPCA
- Western Australian Department of Primary Industries and Regional Development.

Of the submissions, 60% were from organisations directly involved in the live export industry. A breakdown is provided in Table F2.

The non-confidential submissions are available on the department's web page [Review of standards for the export of livestock by air – Australian Standards for the Export of Livestock](#).

Table F2 Stage 2 Issues paper submission breakdown

Category	No. of Submissions	Percent (%)
Individual (affiliation not specified)	0	0
Individual (veterinarian/other profession)	0	0
Individual (Livestock producer)	0	0
Representative Organisation (animal welfare)	2	20
Representative Organisation (industry)	6	60
Business	0	0
Government (State, Federal, Agency)	2	20
Scientific/Research/Academic	0	0

Note: Only submitters that agreed to be identified are included in the table.

The committee used the information provided in submissions to produce a draft report. Further information is available at [ASEL air review](#).

In addition, the department commissioned an independent review of scientific literature relevant to the standards.

Draft Report

Stage 2 of the air review began in June 2019. The committee used the information provided in submissions to the issues paper and the independent literature review to form draft recommendations for changing the standards. It released the recommendations with a draft report for public consultation on 20 June 2019.

The consultation opportunity was again advertised on the department's homepage, live animal export page and *Have your Say* site. A departmental media statement was released. Alerts and reminders were issued via social media platforms such as Twitter. The committee also made direct contact with members of the stakeholder reference group, AAVs, exporters, registered premises owners and state and territory governments.

Consultation closed on 18 July 2019. The committee received 12 submissions from individuals, industry, animal welfare organisations and government departments. Those submitters who agreed to be identified are:

- Agriculture Victoria
- Australian Livestock Exporters Council
- Cattle Council of Australia
- Carolyn Young
- Dorothy Long
- Group of AAVs
- Jan Kendall
- LiveCorp
- Peter Arnold
- RSPCA
- WA Department of Primary Industries and Regional Development.

Of those submissions, 37% were from organisations or individuals directly involved in the live export industry. A breakdown is provided in Table F3.

Table F3 Draft report submission breakdown

Category	No. of submissions	Percent (%)
Individual (affiliation not specified)	2	18
Individual (veterinarian/other profession)	1	9
Individual (Livestock producer)	1	9
Representative Organisation (animal welfare)	2	18
Representative Organisation (industry)	3	28
Government (State, Federal, Agency)	2	18

The non-confidential submissions are available on the department's web page [Review of standards for the export of livestock by air – Australian Standards for the Export of Livestock](#).