liveexport

Review of the Australian Livestock Export Standards

Project LIVE.117
Final Report prepared for MLA and Livecorp
by:

Ian Whan, Rural Management Partners
Simon More, AusVet Animal Health Services
Andrew Bryant and Steve Bladeni, KPMG

Published by Meat & Livestock Australia Ltd
ABN 39 081 678 364
ISBN 1 74036 418 X
November 2003

MEAT & LIVESTOCK AUSTRALIA

LIVECORP

The livestock export program is jointly funded by the livestock exporters and producers of Australia

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PREFACE

Only too rarely do organisations open themselves to critical analysis that might threaten their future. It is highly commendable, therefore, that LiveCorp has commissioned this study and opened the way for fundamental change in the way the live export standards are administered. While the details of any organisational reform are beyond the scope of this review, it is clearly not possible to 'ensure animal welfare quality outcomes' unless the integrity, proficiency and acceptability of both the standards (for managing risk) and the standards delivery system, are equally balanced.

Accordingly, this study is dominated by two recurring themes:

- The first of these is risk management. Because the export of livestock is technically complex in terms of achieving satisfactory animal welfare outcomes and ongoing public acceptance, the industry operates with the assistance of a plethora of regulations, standards and practices all designed to manage the inherent risks and thereby ensure political sustainability.

- The second theme is administration of the various risk management activities and instruments. Because the maintenance of a viable livestock export industry has many stakeholders, it is critical that the relationship between interested groups is stable and effective and otherwise displays all the hallmarks of 'good governance'. It is most important that the industry's own rules be seen to apply as intended and without exception. From the perspective of the live export industry it is also important that a sound working relationship is maintained between the government's export licensing authority (AQIS) and the industry's own regulatory body (responsible for administering exporter accreditation and application of standards). As such, the review presumes that clear evidence of 'independence and objectivity' will be a prerequisite of effective administration of the standards.

The entity with primary responsibility for this review was Rural Management Partners and the principal authors were Ian Whan of Rural Management Partners, Simon More of AusVet Animal Health Services, and Andrew Bryant and Steve Bladeni of KPMG. Throughout the course of our investigations, advice was sought from many people. We wish to acknowledge with thanks the assistance of Bevan Blacklock and Denis Brett from AUS-MEAT, who provided valuable insights into the auditing function. Peter Lang and Rick Dunn also assisted in this area. Andrea Hope of AQIS provided details of the government's aspirations for the review while Steve Banney and Wayne Hall from MLA acted as project supervisors throughout the conduct of the review. Peter Stinson from LiveCorp provided a wealth of information regarding the industry's special problems and needs. Peter also held meetings with all the State Chapter of exporters for the purpose of gathering feedback regarding proposed changes to the rules of accreditation and the standards. This feedback is reported, as supplied, in Chapter 6. The feedback itself indicates that exporters throughout the nation have an acute appreciation of the weaknesses of the current system and are eager to assist with the implementation of beneficial change.

EXECUTIVE SUMMARY

Introduction

There is strong support for retaining Australia's livestock export industry due to the economic benefits it generates for livestock producers and for service providers. However, the number of animal deaths that periodically occur during livestock export has brought into question the capacity of the current management system to deliver outcomes that are socially acceptable. Indeed, maintenance of the live export trade is now seen to depend on universal and ongoing delivery of socially acceptable standards in animal welfare.

In the case of live exports, it is apparent that market forces are not sufficient on their own to bring about socially acceptable outcomes across the whole industry[1]. Therefore, the total management system must include a combination of natural incentives and regulations that are effective in controlling the risks surrounding live export. To this end, the regulations must include measurable standards, applicable to all stages of the supply channel, and monitoring systems that ensure compliance.

For the government to have confidence in the changes proposed by this review, it would seek outcomes along the following lines:

- Revision of the live export standards so that they are outcome-focused, manage key risks within the export chain, are scientifically based, assist in managing high risk consignments and are consistent with State legislation regarding animal welfare and model codes of practice.
- Revision of exporter accreditation processes for the purpose of demonstrating that exporters are both competent operators and compliant with the standards. The actual processes must embody clear standards for the granting and reviewing of accreditation and the application of appropriate sanctions by accredited bodies.
- Revision of the LEAP standards to recognise the relationship with export and all other relevant legislation and the importance of importing country protocols.

Scope and aims of the review

The aim of the study is to review the existing LEAP rules and standards and their administration for the purpose of making recommendations that will enable the industry to deliver animal welfare outcomes that are generally acceptable to the Australian public, and by means that are practical and commercially feasible. The review makes innovative recommendations in a range of areas, including the outcome-based model and opportunities for continuous improvement, the management of animal health and welfare risks, the management of incidents, and achievement of compliance through accreditation and auditing processes.

For the purpose of cross-referencing, each recommendation (in the Executive Summary) is numbered. Table 4, in the final chapter, provides details of each of the key recommendations together with their chapter reference and number in the Executive Summary. The reader may notice immaterial differences in the wording used to express each particular recommendation.

[1] A defining characteristic of the industry is large variations in the inherent riskiness of sea voyages depending on the species, exit port and destinations involved. Thus overt risk management has more relevance to some sectors of the trade than others. But from a public viewpoint, the good reputation of the whole trade is bundled together as one. This means that the reputation of the industry is only as good as its worst operator or worst event. Therefore all operators have a material interest in propagating acceptable performance.

Strategic response to current industry concerns

Strenuous efforts have been made over the past two years to equip the live export industry with support mechanisms and tools needed to meet the animal welfare demands being placed on the industry. This review formulates the industry's response to government initiatives that have included establishment of an Industry Consultative Committee (that will directly assist with self regulation) and a re-write of the pertinent legislation. It is expected that the revised legislation will make direct reference to ALES, thereby giving the standards legal status. As such, the livestock export standards are likely to be used to apply sanctions and accordingly, they must be structured and presented to withstand legal challenge.

An outcome-based model

The ALES documentation is currently modelled on a prescriptive standards approach. As such, it provides detailed information about *the actions that should be taken* by exporters at each stage of export. This is in direct contrast to an outcome-based approach, where emphasis is placed on outcomes rather than suggested actions. In other words, outcome-based standards *describe the results of actions (that is, outcomes) that should be achieved, rather than the actions themselves.* In unison with the project brief, the reviewers strongly support the adoption of outcome-based standards by industry. The outcome-based model will rely on each of the following elements:

- Agreed outcomes, as they relate to animal health and welfare;
- Defined performance targets, as they relate to the agreed outcomes;
- Tools relevant to the achievement of the performance targets, including improved risk and incident management;
- Compliance imperatives, including accreditation and auditing;
- A new Livestock Export Standards and Compliance Organisation (LESCO) with the commitment and capability to lead and manage these recommendations; and
- Compatibility with federal and state legislation.

The success of the outcome-based model can be assessed in terms of consistent delivery of animal health and welfare outcomes that are acceptable to industry, government and the general Australian community.

RECOMMENDATION 1: *It is recommended that industry adopt an outcome-based model, with outcomes forming the basis of risk management (as it relates to animal health and welfare), incident management, and compliance, both in terms of accreditation and auditing.*

Agreed animal health and welfare outcomes. Animal welfare has emerged as an area of intense international interest, and is one of the most important issues facing the live export industry. Opposition to the industry in Australia is almost-entirely based on animal welfare concerns. Animal welfare refers to the state of an individual as it attempts to cope with its environment. Welfare includes animal health, given the important impact of pathogens or pathogen-inducing circumstances on the environment of an individual. Indicators of good (and poor) health are also indicators of good (and poor) welfare. A range of methods are used to assess animal welfare, including behavioural and physiological evaluation, evaluation of production practices and performance, and evaluation of environmental design. To this point, animal welfare during live export has been assessed using two methods:

Method A. Consignment mortality rate. Although mortality is only a crude estimate of animal welfare, it is likely to remain the primary measure of health and welfare during live export because it is robust and there is not yet any practical alternative.

RECOMMENDATION 2*: It is recommended that mortality rates are used as the primary animal health and welfare outcome in the outcome-based standard. Further health and welfare outcomes may be added as knowledge improves.*

Method B. Critical evaluation of specific environments, such as the suitability of specific truck or pen designs. On-going research into live-export related issues is essential for the continuous improvement of standards and conditions and to support risk management measures. The industry should continue to support R&D projects that investigate export-related environments, with specific reference to the improvement of animal welfare.

RECOMMENDATION 3: *It is recommended that the industry continue to support R&D projects about export-related environments, with the specific aim to improve animal welfare.*

Defined performance targets. Performance targets have been defined for the shipboard component of live export. Similar targets are needed for the interval from property-of-origin to feedlot, during feedlotting, and the interval from the feedlot to the export vessel.

Tools relevant to the achievement of the performance targets. Risk management and incident management are tools that will assist exporters to achieve defined performance targets. These methodologies are considered in detail below (and also in chapters 3 and 4, respectively).

Compliance imperatives. Significant changes are recommended with respect to accreditation and auditing, in keeping with the shift to an outcome-based approach. These changes are considered in detail below (and also in Chapter 5).

The Livestock Export Standards and Compliance Organisation. The Livestock Export Standards and Compliance Organisation should play the central role in the implementation, management and improvement of the outcome-based model. LESCO should be an independent body with a broad-based membership, ensuring that the group is credentialed to interpret and uphold the public interest. Responsibilities of LESCO will include overall leadership and management of the outcome-based standards, management of the industry risk management development plan, management of minor incidents[2], management of industry compliance, and other responsibilities.

RECOMMENDATION 4: *It is recommended that LESCO play the central role in the implementation, management and improvement of the outcome-based model. The membership of LESCO will be broad, to ensure that the group is credentialed to interpret and uphold the public interest. LESCO will also need to draw on sound technical skills in order to fulfil many areas of defined responsibility.*

Compatibility with federal and state legislation. To ensure compatibility between government legislation and regulations and the industry's own rules and standards, it is necessary for the latter to be structured to deliver, to the maximum extent possible, outcomes that are consistent with those sought by government. The recommendations made throughout this review are considered to be broadly compatible, in terms of the outcomes they promote, with the outcomes sought by the government's legislation. It should be appreciated, however, that total avoidance of duplication will not be possible while any system of co-regulation exits. Moreover, perceptions about the degree of 'duplication and confusion' will partly reflect, in practice, how well the industry is performing in terms of achieving acceptable animal welfare outcomes and in particular, how well the industry's own standards administrator is performing. The proposal to 'call-up' the LEAP standards through revised export legislation is commended as a mechanism for reducing duplication and confusion.

[2] The management of major incidents is likely to be a shared responsibility (see later section dealing with 'incident management'.

Managing animal health and welfare risks

Key definitions relating to risk management include:

- *Adverse health and welfare outcomes,* which are outcomes that affect the ability of different sectors of the trade to meet agreed animal health and welfare standards;
- *Risk,* which is defined in terms of probability and consequence;
- *Risk factors,* which increase (or decrease) the risk of an adverse outcome; and
- *Risk management,* which is a defined and well-planned process to identify and manage those risks that are considered unacceptable.

There is a range of issues relevant to risk management during live export:

- *Animal health and welfare risks during live export are of critical concern.* As indicated by recent events, live export can lead to a complex mix of adverse health and welfare outcomes that are both physical and biological in nature.

- *Recent incidents can be traced to the use of prescriptive standards to manage risk.* Recent high-mortality incidents during live export, despite full compliance with the industry standards, can be directly attributable to the use of prescriptive standards as the basis of risk management. The prescriptive approach to risk management can only be effective in biological systems if the standards are all-encompassing, accounting for all eventualities. Physical risks can be managed using this approach, but only if the underlying system is completely understood.
- *There are recent – and relevant – international advances in the field of risk management.* Risk management is central to good management practice, and a significant number of risk management resources are publicly-available. Further, several risk management models have potential relevance to live export, including those developed by Standards Australia (a generic approach), and by the European Commission and the Office International des Epizooties (both relating to international animal health). Further, the reviewed risk management models each take a relatively generic approach to risk management and risk communication. Although the approach to risk assessment is generic within the Australian/New Zealand Standard, it has been significantly adapted in the latter models, reflecting the specialised nature of risk sources in different contexts.
- *The Australian and New Zealand Standard for risk management is an appropriate generic model for industry.* As explained in detail in the report, the A/NZ Standard is an appropriate model for risk management within the live export industry. For a range of reasons the EC and OIE methodologies are not directly applicable.

RECOMMENDATION 5*: It is recommended that the management of animal health and welfare risks during live export be based on the methodology of the Australian/New Zealand Standards for Risk Management.*

RECOMMENDATION 6*: Consistent with the subject matter of this review, it is recommended that the industry take an outcome- (rather than a hazard-) based approach to risk management. In simple terms, an outcome-based approach to risk management during live export should deliver each of the following:*

- *A clear and objective understanding of the adverse health and welfare outcomes that are most likely and of greatest consequence for any particular consignment*
- *A robust and appropriate series of strategies to enable exporters to reduce risks to acceptable levels*
- *An effective and practical framework for continuous improvement, underpinned by communication within industry, and between industry and government*

Adoption of an outcome-based model addresses many of the following concerns with respect to risk management, including:

- The need to move away from an approach based on prescriptive standards, whilst also recognising the important role that they could play (to exporters and the community) as a means to achieve baseline practice throughout the industry;
- The need for an outcome-based approach to risk management, utilising international best-practice in the application of risk management methodology;
- The recognition that knowledge is imperfect, particularly in terms of the contributory effect of individual risk factors on the development of adverse outcomes.

However, these recommendations – on their own – do not address each of the following issues:

- The need for risk management to be workable in a commercial setting;
- The need for risk management to adequately consider both biological and physical risks;
- The need for risk management to consider all of the outcomes that may have an adverse effect on health and welfare. For example, although the direct impact of scabby mouth on health and welfare are generally small, the indirect impact could be extremely large if it were to form the basis of rejection at the intended port of discharge;
- Recognition that some aspects of the trade are at greater risk of adverse health and welfare outcomes than others;
- Recognition that the risk environment is under constant flux, which is certain to require changes in focus and/or emphasis with respect to risk management;
- The need for close linkages between all levels of industry, and between industry and government, with respect to risk management; and
- The need for industry-level continuous improvement in risk management.

In response to these additional issues, the reviewers recommend that risk management be undertaken using the following stepped approach:

A. For all consignments

- *A mandatory requirement that each exporter complies with 'standards of baseline practice'.* These standards would be similar to the existing ALES, but with periodic revision to reflect new knowledge.

B. For all consignments to the Red Sea and/or Persian Gulf

- A mandatory requirement that each exporter adequately manages heat stress risk.

C. For all consignments considered at 'high-risk'

- A mandatory requirement that each exporter develop a consignment risk management plan.

RECOMMENDATION 7*: It is recommended that risk management be undertaken during live export as follows:*

- *For all consignments, there is a mandatory requirement that each exporter complies with 'standards of baseline practice';*
- *For all consignments to the Red Sea and/or Persian Gulf, there is a mandatory requirement that each exporter adequately manage heat stress risk; and*
- *For 'high-risk' consignments, there is a mandatory requirement that each exporter develop a consignment risk management plan.*

A. Standards of baseline practice. The Australian Livestock Export Standards is currently considered the minimum standards for achieving acceptable animal welfare when exporting cattle, buffalo, sheep and goats from Australia. Although there is a need to move from prescriptive standards, it is also logical that the current ALES documentation be retained as *'standards of baseline practice'.*

RECOMMENDATION 8: *It is recommended that the current standards be retained as 'standards of baseline practice', and become mandatory for all consignments as part of the new approach to risk management during live export.*

B. Management of heat stress. Heat stress has been an important cause of mortality during live export, particularly in *Bos taurus* cattle. However, because the physical system leading to heat stress is very complex, it is important that risk management efforts are based on a detailed understanding of this system.

RECOMMENDATION 9: *It is recommended that heat stress risk management become mandatory for all consignments destined for ports in the Red Sea and/or Persian Gulf. Heat stress will be managed with the assistance of recently-available software, or equivalent methodology. As more data becomes available, there may be a need for LESCO to extend this requirement to other destinations where there is also a risk of heat stress.*

C. The consignment risk management plan. It is anticipated that most risks will be managed through adherence to baseline practice and heat stress risk management. However, these strategies will not be sufficient to adequately manage all risks in all situations. It is recommended, therefore, that a risk-management plan be prepared for all consignments considered at 'higher-than-average' risk.

RECOMMENDATION 10*: It is recommended that consignment risk management planning become mandatory for all 'high risk' consignments as part of the new approach to risk management during live export. Each plan would be linked to a defined consignment, and would provide documented evidence that individual exporters have completed a well-defined series of steps relating to risk management. Each plan should aim to reduce the risk (to acceptable levels) of adverse health and welfare outcomes during a particular consignment.*

A number of consignments can be considered at higher-than-average risk of adverse health and welfare outcomes, based on accumulated data. At present, 'high risk' consignments could include those with southern *Bos taurus* cattle, goats, sheep held in paddock-based feedlots, as well as older and fatter sheep shipped in the second half of the year. Other consignments at 'high risk' include those that have been prepared by exporters with limited experience, those with links to earlier poorly-performing consignments and those where rejection-at-destination is considered a real possibility. The LESCO should regularly review the 'high-risk' criteria, based on objective mortality summaries, emerging R&D information and general market intelligence.

The risk management plan should be developed collaboratively, using both technical and non-technical input. The accredited veterinarian is expected to play an important technical role during plan development.

RECOMMENDATION 11: *It is recommended that consignment risk management plans follow an agreed proforma, and include:*

- *PART A, to identify, analyse and evaluate animal health and welfare risks*
- *PART B, to identify and assess risk treatment options, to develop a detailed plan to manage the most-important risks.*

Detailed information about the development of consignment risk management plans is presented in the review.

The responsibilities of exporters and the LESCO.

A. Exporters. As part of the new approach to risk management, individual exporters will be required:

- *For all consignments*: to comply with the *'standards for baseline practice'*.
- *For all consignments destined for ports in the Red Sea and/or Persian Gulf:* to adequately manage heat stress risk, using the HS software or an equivalent and justifiable methodology. This requirement may be extended by LESCO to other destinations, as further data become available.
- *For all 'high-risk' consignments:* to prepare a robust and considered consignment risk management plan using accepted methods, as discussed later. The 'high-risk' criteria will be periodically reviewed by LESCO, as further data become available.

RECOMMENDATION 12*: As part of the new approach to risk management, it is recommended that the responsibilities of individual exporters include:*

- *For all consignments: to comply with the 'standards for baseline practice'.*
- *For all consignments destined for ports in the Red Sea and/or Persian Gulf: to adequately manage heat stress risk, using the HS software or an equivalent and justifiable methodology.*
- *For all 'high-risk' consignments: to prepare a robust and considered consignment risk management plan using accepted methods.*

B. The LESCO. As part of the new approach to risk management, the Livestock Export Standards and Compliance Organisation will be required:

- To provide leadership for risk management throughout the live export industry; and
- To manage the industry's risk management program.

i. Risk management leadership

LESCO will play a pivotal role by leading all aspects of risk management throughout the live export industry, by providing vision, sponsorship and direction in the area of risk management, by promoting a positive attitude towards risk issues and risk management, and by developing relevant resources.

RECOMMENDATION 13*: It is recommended that LESCO provide risk management leadership to industry, with the following responsibilities:*

- *Providing vision, sponsorship and direction of all risk management activities;*
- *Promoting a positive attitude to risk investigation and risk management and a commitment to continuous improvement; and*
- *Developing relevant resources, including training opportunities, as necessary.*

ii. Management of the industry risk management program

LESCO will be responsible for the development and management of the industry *'risk management development program'.* This program will have the specific purpose of facilitating continuous improvement in the effectiveness of risk management throughout industry, and will operate through two sub-programs:

- *The Current operations sub-program,* which will encompass an ongoing critical evaluation of current approaches to risk management throughout industry. Expected sub-program outcomes will include consistent, robust and appropriate use of this methodology, improved alignment to government and community expectations, improved understanding and communication of adverse animal health and welfare outcomes and of appropriate risk management strategies, focused and informed feedback, and a developing industry culture of continuous improvement.

- *The Future directions sub-program,* which will encompass an assessment of short- and longer-term changes that will impact on industry, including the development of effective risk management strategies in response to these changes. Expected sub-program outcomes will include an understanding and communication of short- and longer-term changes in the industry risk profile, with respect to animal health and welfare, and appropriate responses to these changes, including – as appropriate – informed support for relevant R&D.

RECOMMENDATION 14*: It is recommended that LESCO also develop and manage an industry 'risk management development program', with the specific purpose of facilitating continuous improvement in the effectiveness of risk management throughout industry. It is recommended that the program include two sub-programs, as follows:*

- *Current operations, encompassing an ongoing critical evaluation of current approaches to risk management throughout industry; and*
- *Future directions, encompassing an assessment of short- and longer-term changes that will impact on industry, including the development of effective risk management strategies in response to these changes.*

Managing incidents

Where pre-determined mortality rates are exceeded for any stage of export, an 'incident' will be deemed to have occurred. It is recognised that two different types of incidents can occur:

- *Major incidents*, with a very high mortality rate and intense public scrutiny, with investigation required and undertaken on the basis of cooperation between government and industry.
- *Minor incidents*, with mortality rates that exceed pre-agreed thresholds, but where government involvement is not considered necessary.

Major incidents will necessarily invoke 'managed investigation' by a government agency and are not considered further in this report. As such, the following recommendations relate specifically to minor incidents. Although minor incidents may not attract sustained public interest, they do highlight failure in the planning or implementation of risk management strategies on specific consignments. *For this reason, it is critical that all minor incidents are investigated*. Detailed guidelines for these investigations are provided in this report, including:

- Routine data collection;
- Terms of reference;
- The skills, attributes and experience of the investigator(s); and
- The format of the investigation report, including detailed description of best-practice during the veterinary investigation of mortality incidents.

All minor investigation reports should be considered and acted upon by LESCO, with this organisation having a specific brief to facilitate continuous industry improvement.

RECOMMENDATION 15*: To maximise the value of an incident investigation, it is recommended that the following data are collected during each sea voyage:*

- *The total number of animals loaded by species, class, deck and port of loading*
- *The total number of animal deaths by species, class, deck, port of loading and date*
- *Daily environmental data, including wet-bulb temperature (either directly or from dry-bulb temperature and relative humidity)*

RECOMMENDATION 16: *It is recommended that minor incident investigations address each of the following terms of reference:*

- *Identification of the cause of the incident, including an understanding of all contributing factors;*
- *Assessment of the adequacy of relevant risk management strategies; and*
- *Development of recommendations on how future consignments should be handled, on the basis of 'lessons learned'.*

RECOMMENDATION 17: *It is recommended that the investigation team, involving one or more people, should be selected on the basis of skills, attributes and experience.*

RECOMMENDATION 18: *It is recommended that the incident investigation report be submitted to LESCO within one month of the incident.*

The responsibilities of exporters and LESCO.

A. Exporters. It is the responsibility of individual exporters to fully-cooperate with any investigation required by LESCO.

B. The Livestock Export Standards and Compliance Organisation. This organisation will play a central role in minor incident management. It will be responsible for ongoing management of a program of minor incident management, ongoing responsibility to review relevant monitoring systems, identification of incidents requiring investigation, overall management of each investigation and critical review of the report findings.

Achieving compliance

Accreditation

Exporters seeking accreditation are currently not required to either demonstrate their knowledge of the ALES or have practical experience regarding the export of live animals. This is considered a significant flaw in current accreditation arrangements. As a consequence of these concerns and as part of the accreditation process, it is recommended that pre-accreditation training become mandatory, and accreditation would only be determined once the training on the appropriate method of export has been completed. LESCO should be responsible for the development, conduct and scheduling of relevant pre-accreditation training and the monitoring of attendance. The fee structure for such training would be determined on a fee-for-service basis.

RECOMMENDATION 19: *It is recommended that pre-accreditation training become a mandatory requirement for new entrants seeking accreditation. Before achieving accreditation, exporters and key staff would be expected to attend relevant training, and demonstrate competence in a range of topics, including outcome-based standards, risk management, incident management, compliance and legislative issues.*

RECOMMENDATION 20: *It is recommended that LESCO be responsible for the relevant pre-accreditation training, including development, conduct, scheduling and quality assurance.*

Exporters should only be accredited on the basis of livestock-type and export-method. This would reinforce the need for exporters to be able to demonstrate a level of skill and knowledge that specifically relates to the type of livestock and method of export, prior to being accredited.

RECOMMENDATION 21: *It is recommended that exporters be accredited on the basis of livestock-type (for example: sheep, cattle and/or goats) and export-method (that is, air and/or sea). Associated training should be specific to livestock-type and export-method.*

The fee structure determined for accreditation could be assessed based on the level of associated risk. There are several reasons for this:

- It is in keeping with the broad approach of the outcome-based standard, which is underpinned at many levels by the issue of risk; and
- It may help to restrict new entries into high-risk areas

RECOMMENDATION 22: *It is recommended that a risk-based approach to determining the costs of accreditation be considered. Using this approach, riskier ventures (which are associated with higher levels of adverse animal health and welfare outcomes) would incur higher accreditation costs.*

The penalty system available to LESCO should range from downgrading in accreditation category to complete withdrawal of accreditation and be consistent with the overall aim of serving the public interest in respect to animal welfare and keeping the trade in place for those suppliers who operate within achievable risk limits.

RECOMMENDATION 23: *It is recommended that LESCO not be constrained in its ability to withdraw or downgrade an exporter's accreditation.*

As an alternative to withdrawing accreditation, it is recommended that LESCO be able to accept formal undertakings from an exporter which outlines the action that (s)he intends to take in order to remedy any identified failure to comply with the standards.

Formal undertakings may also be appropriate where LESCO becomes aware that an exporter does not have, or may not have, the appropriate levels of skill or training. In such skill deficiency situations, LESCO would seek undertakings to ensure that the organisation does not engage in certain activities – for example to only export certain types/breeds of animals or only export to certain countries – until the exporter can demonstrate specified levels of skill or training have been achieved.

RECOMMENDATION 24: *It is recommended that LESCO be given additional powers, in the form of formal undertakings. The formal undertaking regime would be appropriate in minor situations of non-compliance where deterrence is needed, but where more draconian action is not justified.*

Auditing

In view of concerns about the effectiveness of the existing auditing approach, and also as a consequence of the proposed changes to LEAP, significant changes to the scope and emphasis of auditing are required as summarised below.

The timing and intensity of auditing should be determined using a risk-based approach. Particular attention should be given to those exporters associated with high-risk consignments (as defined previously). It would be anticipated that these people would be audited regularly (preferably 3-4 times each year) whereas auditing of other exporters would be undertaken infrequently (according to some demonstrative reason).

RECOMMENDATION 25*: It is recommended that the timing and intensity of audit testing be determined using a risk-based approach utilising designated LESCO assessment scores. This would result in exports with high scores being audited more frequently than low risk exporters.*

Although there is provision for unannounced audits within the current LEAP rules (LEAP 5.1.4), this provision is rarely enacted. The reasons for this include problems associated with notification-to-export, and the limited value that random audits would provide when auditing against prescriptive standards. With respect to an outcome-based standard, however, there are occasions when auditing is more effective if unannounced.

RECOMMENDATION 26: *It is recommended that unannounced audits be conducted as required. Unannounced audits will be most effective if LESCO receives universal and advanced notice of intention to export.*

Currently, the ALES only requires exporters to advise LiveCorp of an intended export where the enterprise is exporting cattle or buffalo on a voyage of 10 days or more. In respect of all export shipments of sheep, goats and in the case of cattle/buffalo on voyages of less than 10 days, neither LiveCorp nor the auditors have any way of knowing when enterprises intend to carry out such exports. Irrespective of the livestock exported and the duration of the voyage, exporters should be required to notify LESCO of their intention to export prior to the event.

RECOMMENDATION 27: *It is recommended that changes be made to ALES requiring exporters, irrespective of shipments involved, to notify LESCO of intention to export at least seven days prior to the event.*

RECOMMENDATION 28: *It is recommended that auditing continue to be undertaken for LESCO by an independent body. Criteria for selection of this body should include independence, proven and relevant auditing skills, coverage and cost-effectiveness.*

RECOMMENDATION 29: *It is recommended that auditing change both in scope and emphasis, as follows:*

- *A primary audit (of all exporters) would be undertaken to assess compliance with agreed animal health and welfare outcomes and competency in the planning and implementation of risk management (relating to animal health and welfare) throughout the export process.*
- *A secondary audit (to be enacted if aspects of the primary audit were considered uncertain or unsatisfactory) would involve more substantive testing to obtain assurances over the exporters' compliance with the standards. It is recommended that a secondary audit be conducted where the primary audit results are unsatisfactory or inconclusive.*

RECOMMENDATION 30*: To assist with the auditing of mortality rates it is recommended that:*

- *Electronic national vendor declaration forms become mandatory for all animals at the point of entry to the live export trade. Further, consideration should be given to the use of individual animal identification to enable numbers to be reconciled at all stages between property of origin and feedlot.*
- *LESCO investigate practical methods to improve the rigour of auditing during the final phase of export, before arrival at the consignment destination.*

RECOMMENDATION 31: *As part of the primary audit, it is recommended that the auditor assess whether appropriate risk management frameworks have been applied by exporters (and other bodies relevant to specified consignments) to effectively identify, analyse, evaluate, treat, manage and communicate key risks associated with animal health and welfare. Key criteria relevant to this assessment would include evidence of an integrated risk management approach, commitment and leadership, a positive and proactive focus, a process-driven approach, planning for continuous improvement, review and documentation, active communication among staff members, resourcing, and training and education.*

RECOMMENDATION 32: *It is recommended that the auditors review risk management plans against model plans that have been developed by LESCO. Further, it is recommended that feedback from this process be used by LESCO as part of the industry risk management development program.*

RECOMMENDATION 33*: It is recommended that a secondary audit be enacted where the primary audit results are unsatisfactory or inconclusive. The secondary audit would audit an increased sample of shipments in addition to increased instances of random physical audits of shipments in order to obtain sufficient evidence to assess compliance or non-compliance.*

RECOMMENDATION 34*: It is recommended that Section 5.3 of the LEAP Accreditation Rules be amended to state that follow-up audits will be conducted for all initial audits that result in the issue of a Corrective Action Request (CAR) to ensure that required actions have been implemented.*

RECOMMENDATION 35*: It is recommended that intelligence detailed above be reviewed by the Compliance Committee on a quarterly basis and incorporated in the LEAP Handbook and subsequently the audit process.*

Review of the LEAP Handbook

The LEAP Rules of Accreditation and the Australian Livestock Export Standards were reviewed and a number of changes recommended in keeping with the move to an outcome-based standard and to achieve better animal welfare performance throughout the live export industry. Relevant sections of ALES have been redrafted as a consequence of the change to an outcome-based approach. The sections incorporating changes include:

- An overview of an outcome-based approach;
- Relevant animal health and welfare outcomes;
- Managing animal health and welfare risks;
- Managing incidents; and
- Achieving compliance, including accreditation and auditing.

The ALES documentation currently forms the basis of risk management within the industry. As a result of the recommended changes, risk management will rely on several strategies, including adoption of the 'standards of baseline practice', which will be based on the current ALES document. As part of the conversion from ALES to 'standards of baseline practice', the current documentation has been critically evaluated, given its new role, against advances in scientific knowledge and against current industry knowledge and experience. As part of the development of 'standards of baseline practice', a number of amendments to current documentation are recommended. These amendments relate to the Notice of Intention to Export, notification of incidents, pen area and heat stress risk management and incident management.

Communication and implementation

LESCO will be responsible for independent administration of exporter accreditation and application of the standards. The operation and resourcing of LESCO should be as follows:

- LESCO would comprise nine voting members representing sheep and cattle producers and exporters (not members of LiveCorp or ALEC), one government officer (from AQIS), membership from the National Consultative Committee on Animal Welfare and the liveship industry, a state government representative and an independent chair. The industry standards manager of merged ALEC / LiveCorp would attend meeting but have no voting rights.
- LESCO would be supported by a professional service provider. Some of the functions presently performed by LiveCorp would logically belong with LESCO eg, collection of statistics pertaining to shipments and administration of the standards.

Several mechanisms are envisaged, as follows:

- Auditing will be undertaken to assess the competency and compliance of the enterprises in relation to the industry's outcome standard. In addition, it is proposed that the auditor routinely

provide generic feedback and recommendations to LESCO. This information would assist LESCO to promote continuous improvement across all sectors of the trade.

- ALES should be reviewed periodically, based on input from LESCO. The revision process would be based on the data stemming from a range of sources, including auditor reports, consignment risk management plans (matched with subsequent consignment performance), incident reports and any relevant findings from research and development. LESCO would give due regard to the full supply chain from the farm gate to the point of disembarkation.

RECOMMENDATION 36*: To garner widespread respect and to be effective in practice, LESCO should be provided with strong and independent leadership and be issued with clear terms of reference and operating guidelines.*

Form of the report

The original terms of reference for the review are specified in section 1.4. To assist with matching specific terms of reference with the reporting system, the following guidelines are offered.

- Terms of Reference 1 *(Review of LEAP)* is provided in Chapter 6
- Terms of Reference 2 *(Managing animal health and welfare risks)* is provided in Chapter 3
- Terms of Reference 3 *(Review of ALES)* is provided in Chapter 6
- Terms of Reference 4 *(Achieving compliance)* is provided in Chapter 5

All other sections of the report supplement the above three sections.

1 INTRODUCTION

1.1 Importance of the industry

In 2002 the export of livestock generated over a billion dollars in export revenue and made Australia the world's largest exporter of livestock. Cattle exports (including buffalo) of 977,540 head contributed 59% of the total revenue while 6.1 million sheep contributed 40% and 135,530 goats contributed 1%. At these levels, live exports of cattle accounted for almost 10% of the total annual turnover and about 16% in the case of sheep (including lambs). Moreover the industry is in growth mode with lack of supply a constraining influence at this time.

While being remote from some of its markets, Australia enjoys a competitive advantage in the supply of live animals due to the nation's freedom from serious diseases such as FMD and BSE. This advantage is complemented by the preference for some countries to import meat animals live, rather than as carton meat. This preference is linked to cultural and logistical imperatives prevailing at this time.

There can be no doubt that the live export trade has put a floor under farm gate prices and strengthened the economics of livestock production throughout Australia – but most particularly in northern and western Australia. If the trade were to be phased out from tomorrow, however, it is unlikely that all of the income generated by the livestock currently exported live, would be lost. Cessation of the trade could, in our opinion, to bring about the following economic impacts:

- Specialist livestock exporters would be put out of business and they would lose the future income stream associated with ongoing trade. In this event, there would be second round implications for employees and service providers.
- The economics of sheep and cattle production in northern and western Australia would suffer severely. Not only would there be less competition but transport costs to a terminal market would be much higher. The age profile of flocks and herds would probably advance with negative implications for production efficiency and product quality. Also more livestock would die in the paddock.
- Abattoir throughput would increase – albeit not proportionately. The additional supply of carcass and carton meat could potentially depress prices in traditional markets. However, such price impacts depend on the elasticity of demand, with the export market being relatively elastic and therefore less responsive to supply from Australia. But saleyard prices are affected most by the number of local abattoirs competing for slaughter sheep at the time. In the short term at least, bid prices would probably plummet and might be kept artificially low due to the market having too few buyers.
- Overall employment within Australia would increase due to the higher labour demands associated with production of carton meat versus live export. The average distance cattle travel might also increase, thereby increasing the demand for transport services.
- The live export industry's customers would be made worst off on account of losing the world's largest supplier to fresh meat markets. In many cases this would mean higher prices and a long period of painful adjustment.

It is clear from the above generalisations that the individuals who would be impacted most in the event of a cessation in the trade would be front line exporters. Without the trade the exporters would have no business to operate and grow. Livestock producers would also suffer significant losses – particularly in the shorter term. Many producers in the more remote areas would suffer capital losses and some might be forced out of business.

On top of the above economic impacts of cessation, there might be implications for animal welfare. It is apparent that continuation of the trade must satisfy a simple mathematical relationship. For the trade to continue, the sum of its net economic gains less any contiguous social costs must exceed

the sum of any social gains, if the trade were to stop, less the net economic losses. Clearly the prospects of this condition being satisfied will be enhanced by any measures that reduce the social costs associated with exporting livestock.

SUMMARY: Australia is the world's largest exporter of livestock with this distinction applying to both sheep and cattle. The live export market underpins saleyard prices throughout much of the nation and as such has the strong support of producers. However, there are other stakeholders in the trade, including members of the Australian public who are concerned about the animal welfare implications of live export.

1.2 Significance of animal welfare

Despite its importance to the nation, the industry does not enjoy universal support due to a widely held perception that it poses too great a risk to the health and wellbeing of the livestock. This concern extends to the treatment of the animals following disembarkation in the importing country. The situation is serious to the extent that it threatens the future of the industry. However, much of the trade is very low risk and could continue with virtually no threat to the welfare of the livestock. In short, community concerns with the industry can be traced to a relatively small number of high impact incidents that have exhibited one or more of the following characteristics:

- Problems with the standards in adequately addressing known biological and physical risks eg,:
  - Selection of unsuitable livestock;
  - Use of paddock based feedlots (without covered troughs) prior to shipment; and
  - High temperature differentials between the exit and entry ports relative to the adaptation of the livestock
- A failure by some enterprises to comply with the spirit of the existing standards.
- Poor treatment of the animals in the recipient country.
- Rejection of animals by the importing country for pseudo political reasons.

Thus the greatest risk to the sustainability of the live export industry is the public's perception of the treatment and consequent welfare of the animals during the assembly and transportation processes that accompany export and the handling practices following disembarkation. Unless the Australian public can be convinced that the livestock can withstand the export and disembarkation processes, without significant welfare impacts, it is likely that the contiguous political pressure could put the trade itself at risk. Reliance on countervailing political influence (from exporters and producers) is not seen as a long term solution[3]. Therefore, developing a knowledge, understanding and acceptance of the welfare standards applicable to the utilisation of livestock is considered to be the crucial first step in implementing management systems that will deliver acceptable outcomes.

[3] The political 'environment' surrounding animal welfare is inherently unstable and unpredictable depending on who is involved at the time. While governments can be highly sensitive to lobbying by exporters, the effectiveness of this lobbying depends on how incidences are reported and interpreted in the press and the subsequent tenor of public reactions.

Developing management systems that will make the live exporting industry sustainable because it is profitable for direct participants and acceptable from a community perspective is difficult because of the number and complexity of influences that determine performance and outcomes. The situation, illustrating the many risks faced by exporters, is shown in Figure 1.

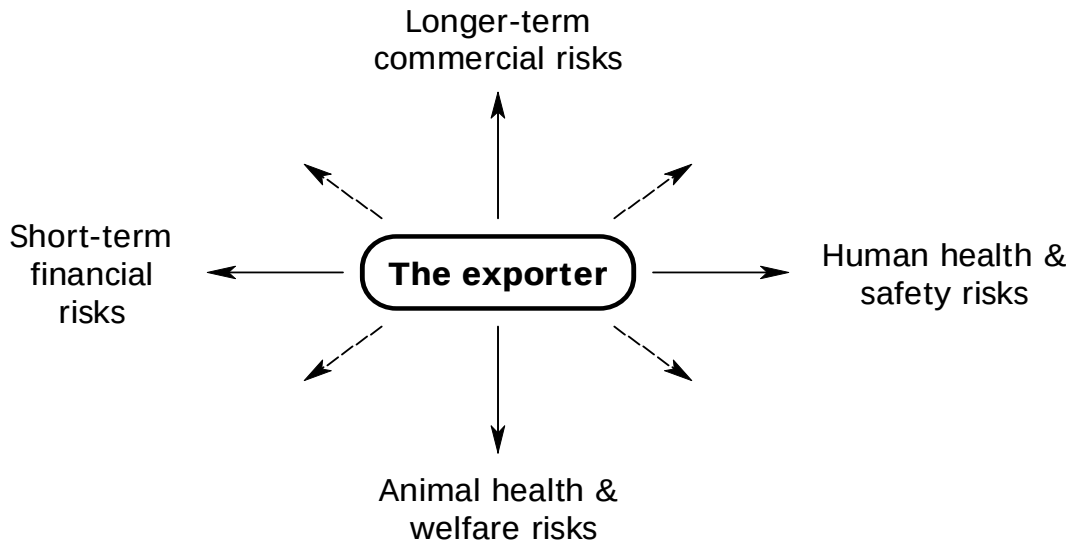


Figure 1: Live exporters face many risks

SUMMARY: Achieving prescribed animal welfare outcomes is the key to the industry's ongoing acceptability to the Australian public. Achieving acceptable outcomes is difficult in the first instance because of the many inherent risks faced by the industry.

1.3 Weaknesses of the current system

Regulating the industry is difficult in the first instance because there is a gap between outcomes that are acceptable to exporters, and those that are acceptable to the community-at-large. It appears that economic forces do not always provide the exporter with sufficient inducement to strive for welfare outcomes that at least match those required to make the industry socially acceptable. Regulation is also physically difficult because live exporting is carried out by vastly different enterprises operating through different ports (often remote and seasonal) at no set time.

Notwithstanding these difficulties, regulation is required to bring about the alignment of private and social goals. Presuming this to be the case, the challenge for development of a total management system is to design and implement a combination of regulations and incentives that optimises the economic and social performance of the trade.

Currently, accredited livestock exporters are meant to achieve compliance by following the 'prescriptive[4] standards approach' as set out in the LEAP handbook (March 2001). These standards provide technical 'advice' with respect to a range of issues, including selection of animals, preparation for shipment and use of veterinary chemicals, and are ultimately designed to result in acceptable animal welfare outcomes. The current standards, however, are unable – by definition – to cope with new risks, or risks additional to those that were considered during Standard formulation. In practice, and as illustrated on a number of occasions during 2002, exporters can comply with the current standards but still suffer mortality rates that are socially unacceptable. In addition, some exporters might be suffering compound losses because they are not complying with the standards in the first instance.

The major faults with the current standards can be summarised thus:

Technical faults

- There is the dual problem of some exporters complying with the existing standards but still suffering mortality rates that are unacceptably high, while other exporters are not complying with the standards in the first place and finding ways of avoiding sanctions.
- There is no easily identifiable outcome standard, directly linked to animal welfare, that can be used as a performance target and as a practical measure of compliance with ALES.
- No system is available that exporters can use to explicitly identify, incorporate and manage risks, and particularly 'high' risks that might be outside the scope of the existing ALES.
- Apart from the recent formation of the Industry Consultative Committee, there is no systematic capacity for bringing about continuous improvement and monitoring progress within the industry against international best practice.

Administrative faults

- Within LiveCorp[5], there is inadequate separation of powers between administration of the LEAP rules and standards, and achievement (via sanctions) of compliance. Through time, this lack of separation has impacted (and is continuing to impact) negatively on both the development of risk management systems and the implementation of systems that result in effective compliance by exporters. Other administrative problems that may be symptomatic of LiveCorp's position include:
  - Low knowledge / experience barriers to entry allowing people to operate as exporters without any prior demonstration of competency.
  - Poor definition of roles and responsibilities in the case of incident investigation. The absence, too, of a clearly defined protocol for investigating incidents including subsequent use of the findings and experience gained.
  - Deficient auditing arrangements that are routine and only test exporters in terms of competency to apply the standards, rather than actual performance of a total management system for achieving acceptable welfare outcomes.
  - Some confusion among exporters regarding the respective roles of LiveCorp as the industry's regulator and AQIS as the government's agency responsible for Commonwealth legislation.

[4] The current standards are 'prescriptive' because they make recommendations as to what action *should be* followed with respect to situations that fall within the scope of contemporary experience. There are several concerns with this approach. It makes use of authoritarian – and generally negative – terminology, in contrast to the exporter's own QA manual, which details actions that *will be* followed. More importantly, a prescriptive approach is of limited value when exporters are faced with 'new' situations, which may involve complex risks. In these circumstances, it will be necessary to supplement the prescriptive standards with detailed risk management planning, as discussed later.

[5] LiveCorp also plays an active role in promoting the industry. This role would appear to compromise its capacity to act objectively in the administration of the standards.

SUMMARY: The current system suffers from technical and structural faults. This review puts forward innovative and practical recommendations for addressing each of the faults identified.

1.4 Aims of the project

In view of the above, the primary purpose of this review is to suggest changes to the system to enable consistent compliance with agreed animal health and welfare outcomes.

The principal objectives as specified in the terms of reference are as follows:

1. *Review and make recommendations on LEAP as contained in the LEAP Handbook*

- The recommendations will be practical and consider commercial constraints
- The recommendations will be based on best industry practice
- Each recommendation will be communicated to industry, with any feedback documented.

2. *Design and formulate outcomes standards based on risk identification*

- These standards will reflect the outcomes required by customer countries and animal welfare stakeholders within accepted industry bounds.
- The outcomes will be practical and achievable and pass consultation with industry.

3. *Review and make recommendations on the relevance of the present ALES*

4. *Examine and make recommendations on the auditing process and other processes needed to gain assurance of compliance.*

- Such recommendations will be based on the most current theory and practice in quality management
- The recommendations should be focussed on achieving a degree of assurance such that the desired outcomes from 2 above are met
- Any commercial implications to the audited exporter will be made apparent and be well documented
- Recommendations should be accompanied by an implementation plan.

1.5 Method

The generic management system

The outcome-based model is being based on the management system as portrayed in Figure 2. By necessity, this system incorporates all the institutional, operational and compliance issues surrounding the trade.

The institutional structure that maintains and applies the standards is seen as critically important to the overall functionality of the system. Unless the standards are jointly agreed and applied by industry and government, their technical quality will count for nothing.

Live export industry stakeholders

Although exporters are ultimately responsible for the animal welfare outcomes of each shipment, the implications due to welfare concerns are much wider, and can include the country as a whole. For this reason, the current review has considered a wider range of industry stakeholders, as listed in Table 1.

SUMMARY: The outcome-based model has been developed with regard to the broader management system that impacts on industry regulation. Further, the review has been undertaken with regard to the wide range of stakeholders associated with the live export industry.

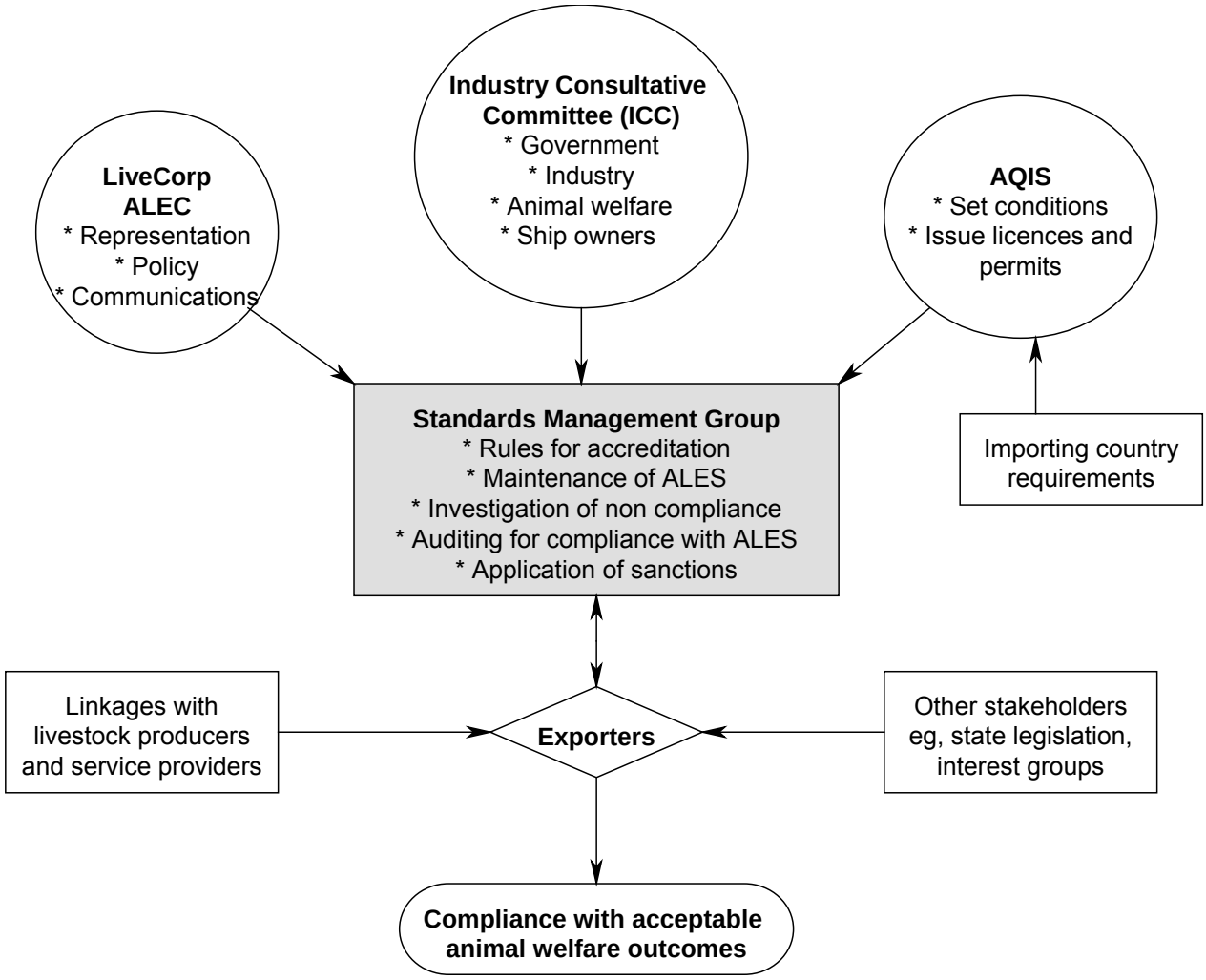


Figure 2: Regulation of the live export industry

Table 1: Industry and government organisations and their roles in livestock exporting

Organisation	Role	Accountable to….
AFFA	Coordination and implementation of government policy, management of major incidents	Minister for Agriculture, Fisheries and Forestry
AQIS	Responsible for inter-government certification; licensing of eligible exporters; assess compliance with industry standards for issuance of export permits under the Export Control Act; issue health certificates to allow entry into importing countries; investigate mortality events.	AFFA, importing countries, Australian livestock industries and exporters
Livestock Export Standards and Compliance Organisation	Governed by a broad based representation with the power and authority to administer LEAP accreditation rules and ALES.	Industry and government but demonstratively free to administer accreditation and the standards in the public interest.
Industry Consultative Committee (ICC)	Communication and coordination between industry and government on livestock export issues. Also evaluation of issues requiring a strategic response.	Industry and government.
ALEC, LiveCorp, MLA	Represent industry to government and the Australian public; fund and manage R&D; determine industry representation on organisations	Industry constituents and the government.
Australian Maritime Safety Authority (AMSA)	Administers maritime orders; investigates mortality events in relation to Maritime Orders.	Minister for Transport, the shipping industry and livestock exporters.
State governments	Animal welfare legislation[6].	Public perceptions of animal welfare

[6] Legislation varies between states but is otherwise general (for example, the avoidance of cruelty to animals etc). Compliance with LEAP and ALES ensures observance of the animal welfare legislation applied by the states, as well as consistency with voluntary QA programs such as Flockcare and CATTLECARE.

2 KEY ELEMENTS OF REFORM

2.1 Introduction

In this chapter, the reviewers have presented a detailed synopsis of the key elements of recommended reform, including:

- The proposed outcome-based model
- Agreed outcomes, as they relate to animal health and welfare;
- Defined performance targets, as they relate to the agreed outcomes;
- Tools relevant to the achievement of the performance targets, including improved approaches to risk and incident management;
- Compliance imperatives, including accreditation and auditing;
- The responsibilities and outputs of the Livestock Export Standards and Compliance Organisation (LESCO); and
- Compatibility with federal and state legislation.

2.2 Key elements of reform

2.2.1 An outcome-based approach

The ALES documentation is currently modelled on a prescriptive standards approach. As such, it provides detailed information about *the actions that should be taken* by exporters at each stage of export. This is in direct contrast to an outcome-based approach, where emphasis is placed on outcomes rather than actions. In other words, outcome-based standards *describe the results of actions (that is, outcomes) that should be achieved, rather than the actions themselves.* In agreement with the project brief, the reviewers strongly support the adoption of outcome-based standards by industry. This latter methodology is preferred because:

- It addresses a range of inherent flaws in the prescriptive standards approach. A detailed critique of these issues, including the management of biological and physical risks, is presented in Chapter 3.
- It infers a close and direct relationship between exporter responsibilities and actions (on the one hand) and levels of animal health and welfare that are considered acceptable to the Australian public (on the other).
- It is consistent with a general international move in business to reward performance rather than activity.

In order to achieve consistency throughout this review, and for the reasons given previously, it is recommended that an outcome-based model is adopted uniformly throughout industry, such that outcomes form the basis of:

- Risk management, as it relates to animal health and welfare;
- Incident management;
- Compliance, both in terms of accreditation and auditing.

RECOMMENDATION 1: The reviewers strongly support the adoption of outcome-based standards by industry. In order to achieve consistency throughout this review, it is recommended that an outcome-based model also form the basis of risk management (as it relates to animal health and welfare), incident management, and compliance (both in terms of accreditation and auditing).

The outcome-based model will rely on each of the following elements:

- Agreed outcomes, as they relate to animal health and welfare;
- Defined performance targets, as they relate to the agreed outcomes;
- Tools relevant to the achievement of the performance targets, including improved risk and incident management;
- Compliance imperatives, including accreditation and auditing;
- A Livestock Export Standards and Compliance Organisation (LESCO) with the commitment and capability to lead and manage these recommendations; and
- Compatibility with federal and state legislation.

The success of the outcome-based model can be assessed in terms of consistent delivery of animal health and welfare outcomes that are acceptable to industry, government and the general Australian community.

SUMMARY: The outcome-based model is reliant on agreed outcomes, defined performance targets, tools relevant to the achievement of these targets, compliance imperatives, a committed and capable Livestock Export Standards and Compliance Organisation and compatibility with federal and state legislation. The success of the outcome-based model can be assessed in terms of consistent delivery of animal health and welfare outcomes that are acceptable to government, industry and the general Australian community.

2.2.2 Agreed animal health and welfare outcomes

2.2.2.1 Animal health and welfare

Animal welfare has emerged as an area of intense international interest, and there is now heightened interest of this issue in relation to animal-based agriculture. Further there have been several key texts on animal welfare (also termed animal well-being in North America) in recent years (Broom and Johnson, 1993; Ewing et al., 1999).

The definition of animal welfare has only been recently agreed – the welfare (also termed well-being in North America) of an individual is defined as its 'state' as it attempts to cope with its environment (Broom and Johnson, 1993). The 'state as it attempts to cope' refers to both:

- how much has been done (in terms of physiology, immunology and behaviour) in order to cope with the environment; and

- the extent to which coping attempts are succeeding (Broom and Johnson, 1993).

The implications of this definition are numerous:

- Welfare is a characteristic of the animal, not something given to it. Consequently, although welfare is affected by what freedoms are given to individuals and the needs of these individuals, it is not necessary to refer to these when specifying welfare;
- Welfare is a continuum, varying from very poor to very good. Logically, an animal's welfare is poor when it is having difficulty in coping, or is failing to cope, with its environment;
- Pain and suffering are important aspects of poor welfare;
- Animals use a variety of methods when trying to cope with their environment; and
- Welfare can be measured scientifically (Broom and Johnson, 1993).

This definition is somewhat at odds with earlier models for animal welfare, including the concept of *'the five freedoms'*, namely freedom from (1) hunger and thirst; (2) discomfort; (3) pain, injury and disease; (4) fear and distress; and freedom to (5) display normal behaviour (Independent Reference Group, 2002). These concepts, while helpful, are now considered to provide a conceptual guide for the design of animal environments (Ewing et al., 1999), rather than a definition of welfare *per se.* To assess whether an essential level of a freedom has been met, it is first necessary to determine what the 'essential' level is, and then to objectively measure whether this has been achieved.

Animal welfare can be considered to include animal health because pathogens or pathogen-inducing circumstances have an important impact on the interaction between an individual and its environment (Broom and Johnson, 1993). Animal health is defined as a state of physical and psychological well-being and of productivity including reproduction (Blood and Studdert, 1988). Logically, indicators of good or poor health are also indicators of good or poor welfare (Broom and Johnson, 1993).

SUMMARY: Animal welfare refers to the state of an individual as it attempts to cope with its environment. Welfare includes animal health, given the important impact of pathogens or pathogen-inducing circumstances on the environment of an individual. Indicators of good (and poor) health are also indicators of good (and poor) welfare.

2.2.2.2 Animal health and welfare during live export

Animal health and welfare (but particularly welfare) is perhaps the most-important issue currently facing the live export industry. Although the industry has been under scrutiny for many years, the intensity of community concern about live export has been heightened over the last 12 months following a number of recent incidents and as a consequence of increased air-play. Animal welfare during live export is now a common topic in the national media, including the ABC and *Sixty Minutes.*

According to opponents of the industry, the trade 'subjects millions of animals to cruel and inhumane practices within Australia, on the journey overseas and at their final destination'[7]. The RSPCA has highlighted a number of specific concerns including 'excessive journey times, the poor husbandry conditions and inherently cruel slaughter and transport conditions in importing countries'.

[7] Media Release 28 July 2003. RSPCA website, www.rspca.org.au

SUMMARY: Animal welfare is perhaps the most-important issue currently facing the live export trade. Opposition to the industry in Australia is almost-entirely based on animal welfare concerns.

2.2.2.3 Assessing animal health and welfare

In order to assess, manage and/or modify animal health and welfare, it is necessary first to be able to measure it. A range of methods are now available (Broom and Johnson, 1993; Ewing et al., 1999), including:

A. Behavioural and physiological evaluation

- *Behavioural:* Preference tests; orientation, startle and reflex responses; responses to pain; movement difficulties, movement prevention; consequences of frustration and lack of control including aggression, stereotypies, apathy and unresponsiveness
- *Physiological:* Heart rate; respiratory rate and body temperature; assessment of the adrenal axes, particularly the hypothalamic-pituitary-adrenal stress-response; general neural response, including neurotransmitters; enzymes and metabolic products; muscle and other characteristics; measures of immune system function, including white cell numbers, antibody production, T-lymphocyte function

B. Evaluation of production practices and performance

- *Production practices:* Critical evaluation of specific production practices
- *Performance:* Reproductive success, life expectancy, weight changes, disease and injury incidence measures.

C. Evaluation of environmental design

- Critical evaluation of all aspects of the environment, including physical, dietary and social.

SUMMARY: A range of methods are used to assess animal welfare, including behavioural and physiological evaluation, evaluation of production practices and performance, and evaluation of environmental design.

2.2.2.4 Assessing animal health and welfare during live export

Current measures of animal welfare during live export

To this point, the welfare of animals during live export has been measured in two different ways:

- Using mortality rates; and
- By critically evaluating specific environments, such as the suitability of specific truck or pen designs.

The former of these measures is undertaken, on a continuing going basis, particularly during the sea voyage. The latter has generally been undertaken as part of a focused evaluation, such as LiveCorp-funded research and development.

SUMMARY: To this point, animal welfare during live export has been assessed using two methods:

- *Through the use of mortality rates, generally with each consignment (although often only during the sea voyage); and*
- *Based on a critical evaluation of specific environments, such as the suitability of specific truck or pen designs.*

Mortality as a measure of animal health and welfare during live export

There has been considerable support for the use of mortality as a measure of animal welfare during live export. For example, the reporting of voyage mortality rates is a requirement under Marine Orders 43 (Independent Reference Group, 2002), and rates have been used as a key monitor of industry performance for some years (Norris and Norman, 2001; Norris and Norman, 2002). Moreover, the rationale for creation of the Independent Reference Group and indeed for this review, has been expressed directly in terms of mortality rates eg, *'Following recent livestock export incidents involving unacceptably high mortalities …'(Independent Reference Group, 2002)*."

Although mortality is only a crude indicator of animal welfare, it is likely to remain the primary measure of health and welfare during live export for several reasons:

- Firstly, *mortality rates are a robust measure of performance.* In a commercial environment, mortality rates can be determined simply, objectively, without bias and without significant cost. Furthermore, because mortality relates to the whole consignment, sampling issues[8] need not be considered and historical data are readily available.[9]
- Secondly, at this stage it would appear that there is no alternative measure of animal welfare that could reasonably be adopted during live export. In most settings, mortality rate is generally accepted as a relatively insensitive[10] measure of welfare. Although this problem could be overcome with the use of alternative measurements, they could only realistically replace or complement mortality rate if they too were simple and able to be measured objectively, without bias and at minimal cost. At this stage, alternative measures (such as various physiological indicators of stress) do not meet all of these criteria.

[8] With many measures, population information is inferred on the basis of sample data. In such situations, rigorous methodology is required to ensure that the sample is representative of the broader population. In contrast, because mortality rates are generally measured on a population basis, sampling issues are not relevant.

[9] All sheep and cattle export mortality data since 1997 is available from LiveCorp http://www.livecorp.com.au/download/%25All%20Cattle%20with%20morts.pdf and http://www.livecorp.com.au/download/%25Sheep%20with%20morts.pdf

[10] That is, the number of deaths is less than the total number of animals receiving less-than-optimal standards of care. A measure of high sensitivity would identify most of the animals affected by poor welfare, whereas measures of low sensitivity would identify a smaller proportion of the animals affected by poor welfare.

This issue of sensitivity should be considered further. When livestock are run in open paddocks, death is generally a rare event following less-than-ideal standards of care. Despite the welfare of many animals being poor, mortality on-farm is low and therefore is considered a relatively insensitive basis for measurement. However, the situation is different in the case of live export. During live export, animals are under greater welfare and disease challenge, being exposed to a wide range of unfamiliar pathogens and stresses as a result of transport, social change, unfamiliar environments and high stocking densities. As a consequence, and in the face of less-than-ideal standards of care, there is the potential for disease course to be shorter and mortality rates higher than would occur under on-farm conditions. Consequently, the sensitivity and related utility of mortality rate as a measure of animal welfare during live export is likely to be higher than would be the case with animals run in open paddocks.

The above mentioned discussion provides a critical evaluation of mortality as the basis of the proposed outcome standards. It does not imply, or intend to imply, that acceptable levels of mortality (and therefore welfare) cannot be achieved during live export. As indicated throughout this document, acceptable mortality rates can be achieved in practice, provided mortality thresholds are set low, and risks are understood and managed appropriately.

SUMMARY: Mortality is only a crude estimate of animal welfare. Nonetheless, it is likely to remain the primary measure of health and welfare during live export: because:

- *It is robust; and*
- *There is not yet any practical alternative.*

Other measures of animal health and welfare during live export

As indicated in the previous section, there is currently no robust and practical alternative to mortality as a measure of animal health and welfare during live export. However, additional measures would be helpful, providing additional information about animal welfare at defined stages of export. It is recommended that industry support R&D to identify additional measures of health and welfare that would be suitable for use during live export.

It is further recommended that the industry continue to support R&D projects about export-related environments, with the specific aim to improve animal welfare. The recent investigation of the *MV Becrux* is a useful example, where a potential welfare problem (that is, animals' access to feed and water whilst penned at sea) was identified (More, 2002), and R&D funds are since been used to evaluation and, as necessary, resolve these concerns.

RECOMMENDATION 3: It is recommended that the industry support R&D to identify additional measures of health and welfare that would be suitable for use during live export. Further, it is recommended that industry continue to support R&D projects about export-related environments, with the specific aim to improve animal welfare.

2.2.2.5 Recommended animal health and welfare outcomes

Based on the earlier discussion, it is recommended that mortality rates are used as the primary animal health and welfare outcome in the outcome-based standard. Further outcomes, relevant to health and welfare, may be added as knowledge improves. Such additions would not alter the basic framework of the outcome-based approach.

> *RECOMMENDATION 2: It is recommended that mortality rates are used as the primary animal health and welfare outcome in the outcome-based standard. Further health and welfare outcomes may be added as knowledge improves.*

2.2.3 Defined performance targets

With respect to mortality rates, several performance targets are already defined, including:

- Voyage mortality rate for sheep and goats *(of no more than 2% of the consignment)*
- Voyage mortality rate for cattle and buffalo *(of no more than 1% of the consignment)* (LiveCorp, 2001)

The level of these thresholds has been the subject of recent debate, but is not considered further in this review.

There is also a need (following input from industry, government and community) for mortality thresholds to be determined for all other intervals during the export process, including:

- property-of-origin to feedlot;
- feedlot; and
- feedlot to export vessel.

> *SUMMARY: With respect to mortality rates, performance targets have been defined for the shipboard component of live export. Similar targets are needed for property-of-origin to feedlot, feedlot and feedlot to export vessel.*

2.2.4 Tools relevant to the achievement of the performance targets

In order to achieve defined levels of performance (in this case, mortality thresholds at each stage of export), there is a need for significant changes in risk management and incident management, as follows:

Risk management (considered in detail in Chapter 3)

Risk management is a key element of reform. The review recommends a shift from the current prescriptive approach to an outcome-based approach modelled on international best practice in this area. It is important that risk management is robust and transparent, in keeping with accepted business practice.

It is recommended that risk management be undertaken within industry using the following stepped approach:

- For all consignments, a mandatory requirement that each exporter complies with 'standards of baseline practice';
- For all consignments to the Red Sea and/or Persian Gulf, a mandatory requirement that each exporter adequately manage heat stress risk; and
- For 'high-risk' consignments, a mandatory requirement that each exporter develop a consignment risk management plan. 'High-risk' consignments can be defined as all consignments that are at increased risk of one or more adverse health and welfare outcome. The consignment risk management plan would be linked to a defined consignment, providing documented evidence that individual exporters have completed a well-defined series of steps relating to risk management, including risk assessment, risk management and risk communication.

Incident management (considered in detail in Chapter 4)

Incident management is another key element of reform. An incident is deemed to have occurred when agreed outcomes are not achieved – in this case, the mortality rate has exceeded defined performance targets. In Chapter 4, detailed information is presented about the investigation of a minor incident (those not involving government), including routine data collection, terms of reference, the investigating team, the investigation report, timing and linkages with the LESCO.

SUMMARY: Risk management and incident management are key elements of reform. These tools are critical to industry efforts to achieve defined performance targets. These methodologies are considered in detail in Chapters 3 and 4.

2.2.5 Compliance imperatives

As mentioned in Section 2.1, the overall goal of the model will be compliance with acceptable animal health and welfare outcomes. For this reason, compliance imperatives are critical to the overall review.

Under the current LEAP, compliance is achieved through two related mechanisms, namely accreditation and auditing. These elements will be retained, but amended in line with an outcome-based approach. Detailed information regarding compliance is presented in Chapter 5.

Accreditation

It is recommended that the accreditation be strengthened to include each of the following elements:

- Pre-accreditation training;

- Accreditation on the basis of livestock-type (for example, sheep, cattle and/or goats);
- Publication, at least within industry circles, of the circumstances surrounding code violations and sanctions imposed on exporters;
- An accreditation fee structure determined on the basis of associated risk; and
- The introduction of formal undertakings, as an alternative to the downgrading or withdrawal of accreditation.

Auditing

Auditing arrangements are currently based on a prescriptive standard. With the shift to an outcome-based standard, it is recommended that there be significant changes to the scope and emphasis of auditing, as follows:

- A primary audit would be conducted with all exporters. The purpose of the primary audit is two-fold. With respect to animal health and welfare outcomes, it would be undertaken to test the validity of reported information, and would also be used to compare actual results with agreed thresholds throughout the export process. With respect to risk management, it would be conducted to assess competency in the planning and implementation of risk management relating to animal health and welfare throughout the export process.
- A secondary audit would only be enacted if aspects of the primary audit were considered uncertain or unsatisfactory, and would be undertaken to assess compliance with all other aspects of LEAP, including adherence to the 'standards of baseline practice'.

It is also recommended that the timing and intensity of auditing be determined using a risk-based approach, with particular attention being given to those exporters associated with high-risk consignments.

> *SUMMARY: Significant changes are recommended with respect to accreditation and auditing, in keeping with the shift to an outcome-based approach. These changes are considered in detail in Chapter 5.*

2.2.6 The Livestock Export Standards and Compliance Organisation

At the time of writing this report, a proposal has been developed by LiveCorp and the Australian Livestock Export Council (ALEC) for the establishment of a standards organisation (with legal status) that would incorporate a Livestock Export Standards and Compliance Organisation (LESCO) and a Compliance Group as shown in Figure 3. LESCO would have representation from industry, government and other stakeholders and would replace the LEAP Accreditation and Standards Committee.

This proposal is very timely, and fits neatly within the key elements of reform of the current review. Relevant to the reforms recommended in this review, LESCO would have overall responsibility for the new outcome-based industry standards, and would provide leadership in the implementation, management and improvement of the outcome-based model. LESCO membership will be broad, thereby ensuring that the group is credentialed to interpret and uphold the public interest[11]. Further, LESCO will need to draw on sound technical skills in order to fulfil many areas of defined

[11] Making the representation of LESCO 'broad-based' will maximise the scope for reconciliation through time between the LEAP standards and other relevant regulations.

responsibility. The central purpose of substituting the current arrangements with LESCO is to impose an administrative structure that is demonstratively expert but also independent of exporter self interest.

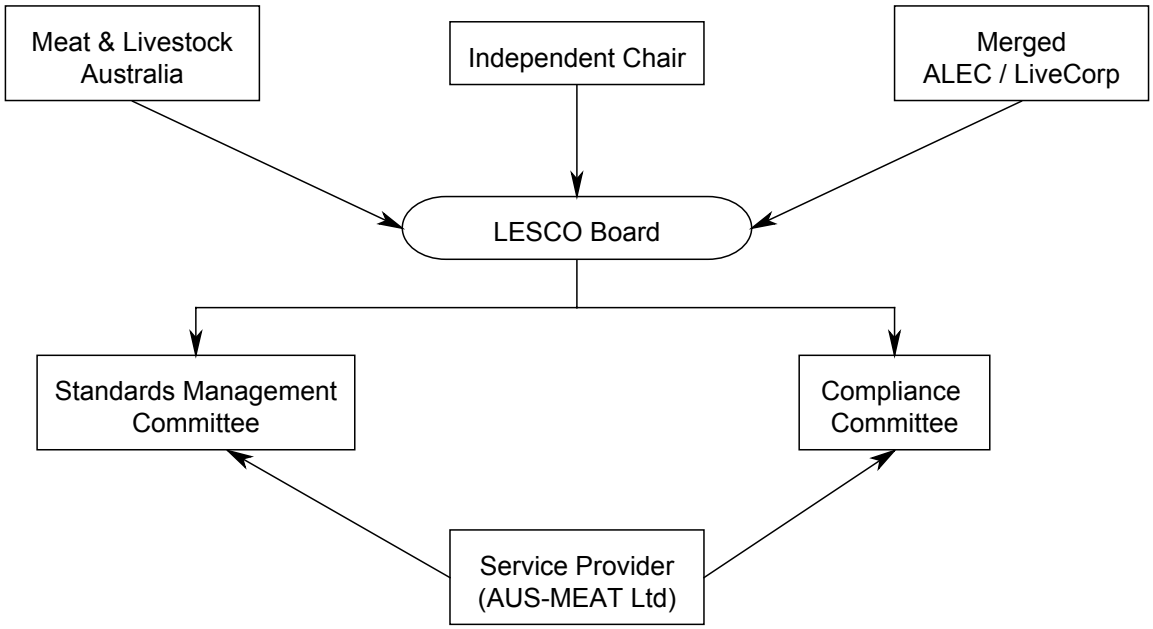


Figure 3: Structure of the Livestock Export Standards and Compliance Organisation

RECOMMENDATION 4: It is recommended that LESCO play the central role in the implementation, management and improvement of the new outcome-based standards. The membership of LESCO will be broad, to ensure that the group is credentialed to interpret and uphold the public interest. LESCO will also need to draw upon sound technical skills in order to fulfil many areas of defined responsibility.

In order to implement, manage and improve the new outcome-based standards, it is recommended that the responsibilities of the LESCO include:

A. Overall leadership and management of the outcome-based standards

- Maintaining the process of developing the Australian Livestock Export Standards – ALES;
- Acting as an independent standards consultative body on behalf of industry and government;
- Monitoring Codes of Practice relevant to industry operating standards and assessing their impact on the industry;
- Providing input in the development and application of relevant Standards outside ALES including Government regulation.

B. Leadership of the outcome-based approach to risk management

(see Chapter 3 for further details)

- Providing vision, sponsorship and direction throughout industry in the area of risk management, thereby ensuring that:
  - the principles and methods of risk management are effectively understood by relevant industry people,
  - risk management methods are consistently applied; and
  - adverse health and welfare outcomes are effectively managed by individual exporters.
- Promoting a positive attitude towards risk and risk management, and a genuine commitment to continuous improvement, at all levels of industry.
- Developing relevant resources, including training opportunities and risk management guidelines/templates, as necessary.

C. Management of the industry risk management development plan

(see Chapter 3 for further details)

With respect to *current operations:*

- Ensuring that risk management is being developed and applied consistently throughout industry, and is in line with the expectations of government and the wider community;
- Ensuring that risk management (both in general terms and with respect to specific risk mitigation strategies) is consistent with ongoing advances in knowledge. The LESCO would be expected to periodically review the content of the *'standards of baseline* practice', the destinations requiring management of heat stress risk and the 'high-risk' criteria relating to risk management planning.
- Ensuring that consignment risk management plans are appropriate and pragmatic with risk mitigation strategies benchmarked against industry best-practice, thereby encouraging continuous improvement.
- Ensuring that adequate monitoring is provided throughout the live export supply chain to assess risk management issues.

With respect to *future directions,* taking responsibility for:

- The critical evaluation of existing risks, the identification of short-term changes and of potential responses in the industry risk profile, with respect to animal health and welfare; and
- The forecasting of longer-term changes in the industry risk profile, with respect to animal health and welfare, and to respond to these forecasts as appropriate.

D. Management of incidents

(see Chapter 4 for further details)

In general terms:

- Overall management of a program of minor incident management, including all issues relating to cost, timeliness, quality and continuous improvement; and
- Ongoing responsibility to review the appropriateness and effectiveness of relevant systems to monitor defined health and welfare outcomes.

With respect to specific incidents:

- Identification of minor incidents requiring investigation;
- Overall supervision of the investigation process, including ongoing linkages with the investigation team; and
- Critical review of the investigation findings. Findings from each report may impact on individual exporters (through compliance) and on the industry as a whole (through the industry risk management development program - see 3.4).

E. Management of industry compliance

(see Chapter 6 for further details)

- Overseeing the on-going development of the LEAP Rules for Accreditation.
- Overall supervision of pre-accreditation training
- Ongoing review of auditing reports
- Overseeing investigations and detailed review of non compliance matters.
- Providing leadership in the application of sanctions authorised under the Rules of Accreditation including dispute procedures.

F. Additional responsibilities

- Overseeing the AQIS Accredited Veterinarian scheme.

Figure 4 and Figure 5 illustrate the expected inputs into and output/outcome from LESCO, with respect to these responsibilities.

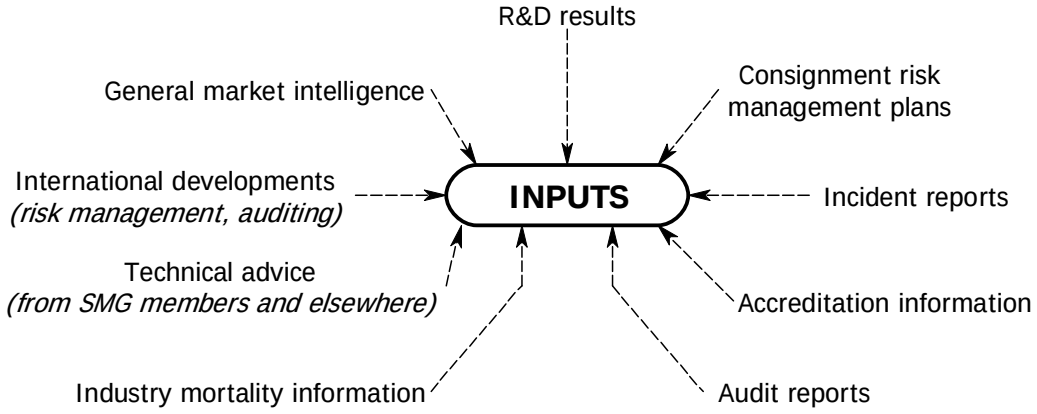


Figure 4: Expected inputs into LESCO

It is anticipated that sub-committees may operate within LESCO. Relevant sub-committees could relate to risk management leadership, the risk management program, minor incident management and management of compliance. As illustrated in Figure 2, there will be a need for detailed collaboration between sub-committees.

SUMMARY: Responsibilities of LESCO will include overall management of the outcome-based standards, risk management leadership, management of the industry risk management, minor incident management and management of industry compliance.

It is expected that LESCO would meet at regular defined intervals and would accept submissions from a variety of sources including bodies represented in membership. Given the detailed responsibilities of LESCO, full- and/or part-time commitment from one or more persons would be required.

The proposed system of reporting between the exporter, LESCO and AQIS is shown in Table 2. A reduction in perceived duplication will depend on the commitment and proficiency with which exporters achieve the industry's own standards.

Table 2: Exporter's external reporting agenda

Exporter	Livestock Export Standards and Compliance Organisation	AQIS
Notice of Intention	√	√
Consignment risk management plan[a]	√	Indication only
Export permit		√
Incident report	√	√

a See section 3.4 for further details

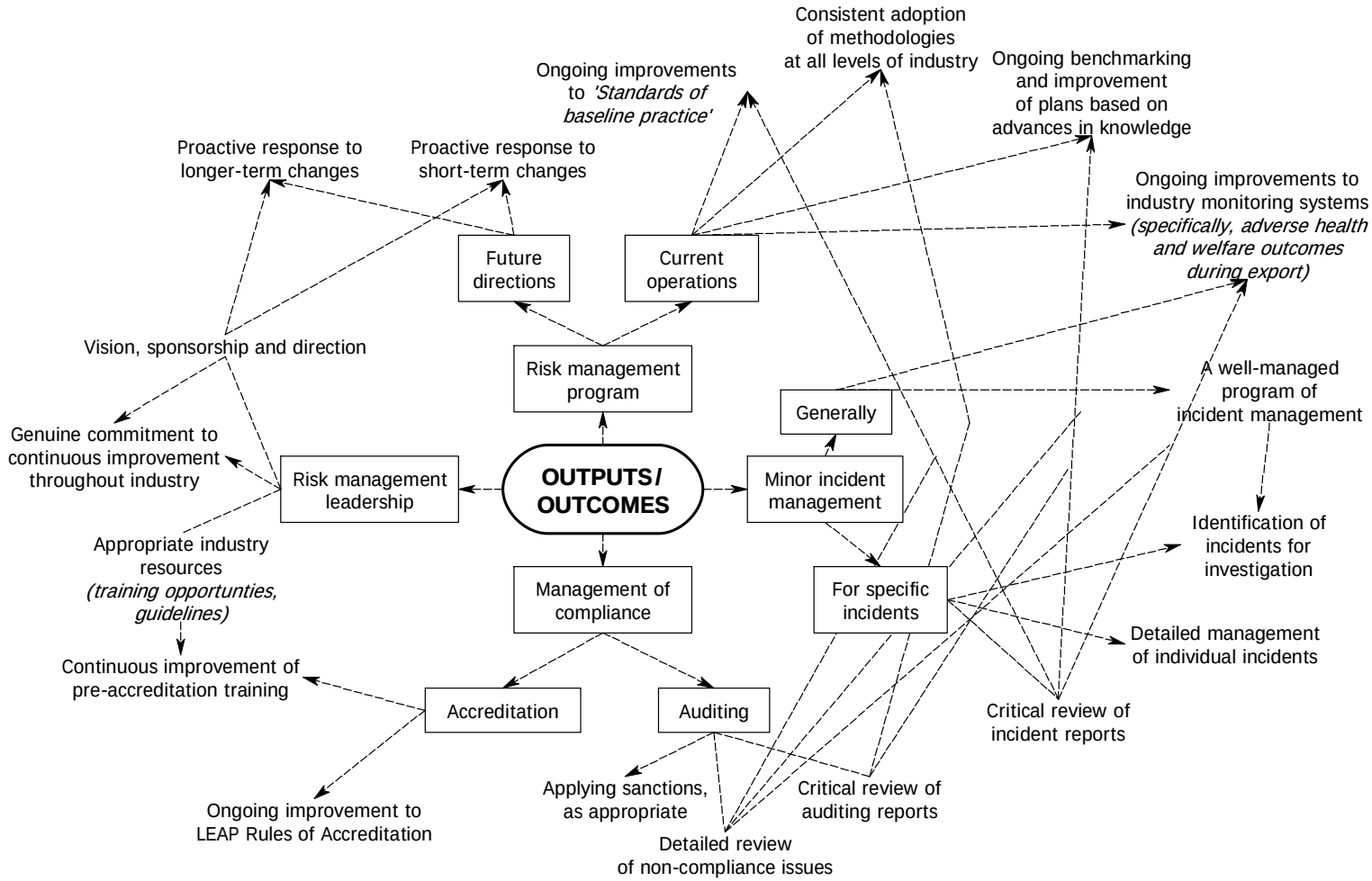


Figure 5: Expected outputs/outcomes from LESCO

2.2.7 Compatibility with federal and state legislation

The Independent Reference Group recognised that government legislation and regulation is needed to support the industry's own QA standards. It also made the point that government must maintain an ability to intervene directly or through judicial action if necessary. Thus the guiding principle is to find the optimal combination of industry rules and standards and government regulations. This review supports the role of regulation in achieving compliance and concedes there might be a need for more regulation providing it is not cumbersome in terms of application and administration.

Federal and State legislation impinge on the industry via a number of legislative responsibilities. The 'export interface' is governed by the *Commonwealth's Export Control Act 1983* and the *Navigation Act 1912*. With respect to live exports, the *Export Control Act* requires that the livestock are fit to travel and otherwise meet importing country standards. The *Australian Meat and Livestock Industry Act 1997* is also relevant in terms of requiring exporters *(inter alia)* to be fit and properly persons, competent and financially viable.

State animal welfare legislation is not completely consistent across the nation but imposes a clear cut demand for the industry to observe basic animal well being. To be effective, the industry's rules and standards must be consistent and compatible with the above legislation.

However, a number of problems have been identified for achieving optimal functionality between industry and government regulation. Apart from the sheer complexity of reconciling all the demands, mechanisms and organisations that are involved, several specific problems exist:

- For example, the different sets of legislation can lead to duplication and inconsistencies with respect to incident investigation and imposition of sanctions.
- Also, the *AMLI Act* does not differentiate between the species of animal covered nor does it differentiate between exporters by sea and air.

The government is currently reviewing the legislation and regulations that are applicable to the live export industry with the aim of producing a new model. Key elements of the government's proposed model have been made public and have direct relevance to the industry's response. In particular, the legislation is likely to make reference to the livestock export standards, thereby giving them legal status.

AQIS has indicated that LESCO will be able to function as surmised throughout this review providing:

- It is recognised by the industry as a standards setting body;
- It holds national accreditation powers; and
- It is subject to independent audit.

A possible outcome of the government's review is a merging of the *Export Control Act* and the *Australian Meat and Livestock Industry Act*. It is likely that export licences issued under the revised legislation will be specific to the species of livestock and the mode of travel. In addition, renewal of licences is likely to give consideration to the past performance of the applicant. These changes are seen to be totally consistent with the form and intent of the changes recommended in this review for the LEAP rules and ALES.

SUMMARY: To ensure compatibility between government legislation and regulations and the industry's own rules and standards, it is necessary for the latter to be structured to deliver, to the maximum extent possible, outcomes that are consistent with those sought be government. The recommendations made throughout this review are considered to be broadly compatible, in terms of the outcomes they promote, with the outcomes sought by the government's legislation. It should be appreciated, however, that total avoidance of duplication will not be possible while any system of co-regulation exits. Moreover, perceptions about the degree of 'duplication and confusion' will partly reflect, in practice, how well the industry is performing in terms of achieving acceptable animal welfare outcomes and in particular, how well the industry's own standards administrator is performing.

AQIS have developed a pictorial model that places the exporter within the context of sourcing livestock and achieving all the prerequisites associated with exporting livestock successfully. This model has been reproduced in Figure 6.

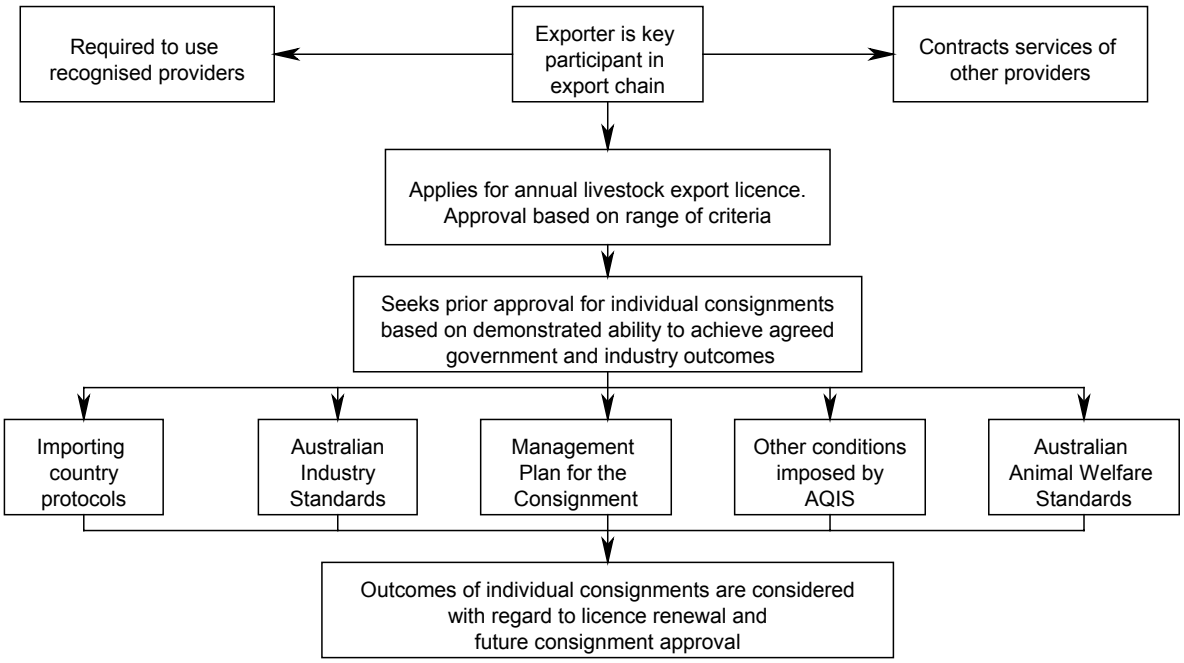


Figure 6: Model for Exporter (Source: AQIS)

References

Blood, D.C. and Studdert, V.P., 1988. Baillière's comprehensive veterinary dictionary. Baillière Tindall, London.

Broom, D.M. and Johnson, K.G., 1993. Stress and animal welfare. Chapman & Hall Animal Behaviour Series. Chapman & Hall, London, 211 pp.

Ewing, S.A., Lay, J., D.C. and von Borell, E., 1999. Farm Animal Well-Being. Prentice Hall, Upper Saddle River, New Jersey, 357 pp.

Independent Reference Group, 2002. A way forward on animal welfare: a report on the livestock export industry, Canberra.

LiveCorp, 2001. LEAP Handbook. Livestock Export Accreditation Program. Accreditation Rules and Australian Livestock Export Standards. March 2001. LiveCorp, Sydney.

More, S.J., 2002. Investigation of cattle deaths during Voyage 1 of the MV Becrux. Final Report prepared for Meat and Livestock Australia, Revision A, 23 September 2002., AusVet Animal Health Services, Brisbane.

Norris, R.T. and Norman, G.J., 2001. Livestock export trade from Australia: summary information for 2000. Miscellaneous Publication 15/2001, Agriculture Western Australia, LiveCorp, and Meat and Livestock Australia.

Norris, R.T. and Norman, G.J., 2002. LIVE.206. Live export trade from Australia: summary information for 2001. Miscellaneous Publication 007/2002, Agriculture Western Australia, LiveCorp, and Meat and Livestock Australia.

3 MANAGING ANIMAL HEALTH AND WELFARE RISKS

3.1 Introduction

Risk management is a defined process, based on the identification, assessment, management and communication of risks (Standards Australia, 1999; Toma et al., 1999). It is widely used as a means to support decision-making, and is now considered central to good management practice in a wide range of disciples (Hardaker et al., 1997).

SUMMARY: Risk management is central to good management practice.

A significant number of risk management resources are publicly-available, having been issued by various government bodies and private associations throughout the world. The intention of most of these documents is to provide guidance to organisations or industries on the approach to risk management. The documents represent good international practice, and should be considered when further developing risk management methodologies for a particular organisation or industry.

SUMMARY: A significant number of risk management resources are publicly-available, providing a basis for good international practice.

3.2 Definitions

3.2.1 Adverse health and welfare outcomes

During live export, a range of outcomes may occur that adversely affect the ability of different sectors of the trade to meet agreed animal health and welfare standards. The *adverse health and welfare outcomes,* which generally cannot be predicted with certainty, include:

- *Injury / physical trauma* during transport;
- *Cold stress* and *feedlot-related salmonellosis* during feedlotting; and
- *Heat stress* and the *PSI complex* during the sea voyage.

3.2.2 Risk

Risk is defined in terms of probability and consequence. Therefore, the risk of an adverse outcome can be estimated after considering both its probability (the likelihood that it will occur) and its

consequence (the impact of this outcome once it does occur). An overall assessment of risk is generally obtained using a risk matrix (which considers both probability and outcome), and can be considered either acceptable or not. Unacceptable risk requires some form of intervention (or risk management).

3.2.3 Risk factors

There are a wide range of *risk factors* that can impact on animals during live export. These factors increase (or decrease) the risk (that is, probability and/or consequence) of an adverse outcome, but are not outcomes themselves. For example, each of the following has been identified as risk factors during live export:

- the breed, sex, age and innate fitness of the animal;
- characteristics of the property-of-origin, including length of curfew, standard of property management; and
- factors relating to feedlotting, including weather and feeding regimes

A broad range (or web) of risk factors that influence health and welfare during live export is presented in

Figure 7.

Risk factors have several important characteristics:

- Adverse outcomes generally develop following the influence of a number of risk factors. For example, a web of risk factors contribute to the development of the PSI complex, including animal factors (age, condition score) and factors related to the property-of-origin (pasture, location);
- The web of risk factors for one particular outcome is generally different to the web of risk factors for another outcome. As examples, risk factors for injury during transport include length and type of curfew, length of trucking and standard of care by the transport operator. In contrast, risk factors for feedlot-related salmonellosis include a range of factors affecting host resistance and salmonella challenge; and
- Although risk factors may only occur at a specific stage of the export process (such as the animal, the farm-of-origin, during transport, the feedlot etc), it is critical to note that their influence may occur at this or later stages of export. For example, although the PSI complex mainly occurs on-ship, key risk factors for this condition mainly relate to the animal and the property-of-origin.

3.2.4 Risk management

Risk management is a defined and well-planned process to identify and manage those risks that are considered unacceptable. The desired outcome of a risk management program is a reduction in risk to levels considered acceptable. It involves a number of steps, as follows:

- identifying options for managing risk;
- assessing those options; and
- preparing and implementing appropriate risk management plans (Standards Australia, 1999).

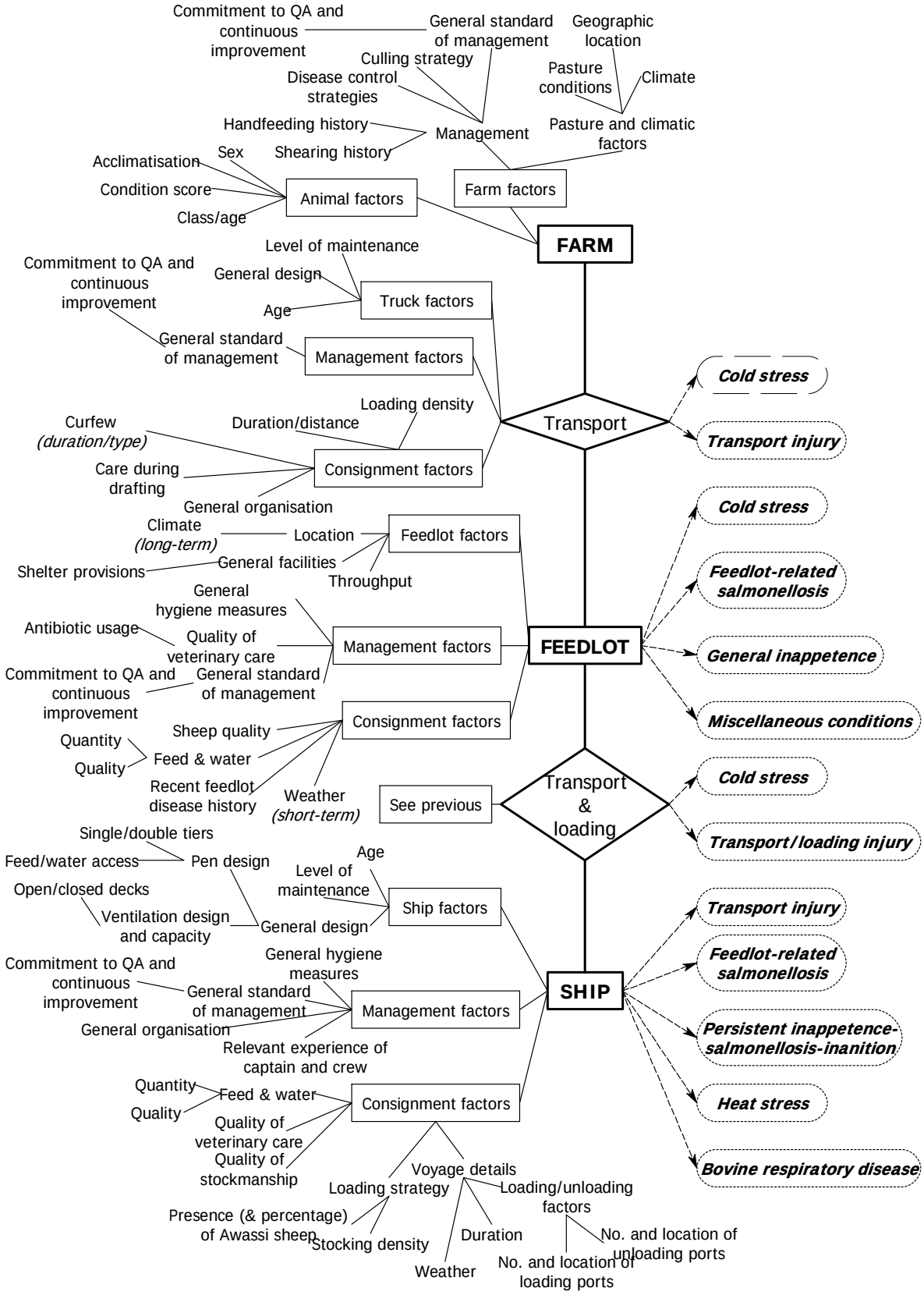


Figure 7. Causal Web of Risk Factors - A diagrammatic representation of the live export process, including the causal web of risk factors (on the left) leading to adverse health and welfare outcomes (to the right) during live sheep export.

3.2.5 Risk management

Risk management is a defined and well-planned process to identify and manage those risks that are considered unacceptable. The desired outcome of a risk management program is a reduction in risk to levels considered acceptable. It involves a number of steps, as follows:

- identifying options for managing risk;
- assessing those options; and
- preparing and implementing appropriate risk management plans (Standards Australia, 1999).

3.3 Risk management – a critical review

3.3.1 Current approaches to risk management during live export

Until very recently, industry has managed risks during live export using a "prescriptive standards approach". This approach has been based on the Australian Livestock Export Standards (ALES), which documents a set of prescriptive instructions relevant to all stages of export. Using this approach, the management of animal health and welfare risks was considered satisfactory provided these instructions were fully complied with.

It is now clear, however, that there are serious flaws with the prescriptive standards approach to risk management. Based on recent events, particularly during 2002, there is now compelling evidence of high mortality events despite full compliance with these industry standards. Although these events have been relatively uncommon (with ALES proving adequate in most circumstances), they have, nonetheless, added to existing community concerns about live export.

Reasons for the failure in the prescriptive standards approach have been uncovered following a critical review both of the standards and of the causes of recent mortality events. These can be specifically attributed to the ongoing use of prescriptive standards to manage biological and physical risks, as follows:

- *Biological risks.* By their nature, biological systems are complex, and system outcomes are not highly predictable. To illustrate, the 'cause' of feedlot-related salmonellosis can best be described using a diagrammatic web, with disease being associated with a wide range of interacting risk factors at each stage of export. Furthermore, although the probability of an outbreak is increased when certain risk factors are present, it cannot be predicted with any level of certainty. *Therefore, a prescriptive approach to risk management can only be effective in biological systems if the standards are all-encompassing, accounting for all possible eventualities.* Although the current ALES documentation is very sound, it is not all-encompassing and cannot be used successfully as the basis for risk management in all situations.
- *Physical risks.* Although physical systems are also complex, system outcomes can generally be predicted with a much higher level of certainty. For example, with a sound understanding of heat gain and heat loss on ship, it is possible – with some certainty – to predict deck conditions during live export. *Therefore, prescriptive standards can be used as the basis of risk management in physical systems.* The failure to adequately manage physical risks (specifically, heat stress) using the current ALES documentation can be attributed to gaps in understanding. These standards do not consider all of the factors relating to heat gain and heat loss on-ship, and therefore cannot be used – in its current form – as a means to manage heat stress risk in all situations.

SUMMARY: Recent high-mortality incidents during live export, despite full compliance with the industry standards, can be directly attributable to the use of prescriptive standards as the basis of risk management. The prescriptive approach to risk management can only be effective in biological systems if the standards are all-encompassing, accounting for all eventualities. Physical risks can be managed using this approach, but only if the underlying system is completely understood.

3.3.2 Alternative risk management models

3.3.2.1 Relevant models

Prescriptive frameworks are no longer a common approach to risk management. Rather, risk management in a range of settings is now undertaken using one of a series of generic 'risk management models'. For the purposes of this review, several risk management models have been considered in detail, including:

- The Australian and New Zealand Standard on Risk Management (Standards Australia, 1999) *[a generic approach to risk management]*;
- Import risk analysis, within the Terrestrial Animal Health Code of the Office International des Epizooties (OIE, 2003) *[relating to international animal health]*; and
- The first report on the harmonisation of risk assessment procedures from the European Commission (European Commission, 2000) *[relating to international animal health and welfare].*

SUMMARY: Several risk management models have potential relevance to live export, including those developed by Standards Australia (a generic approach), and by the European Commission and the Office International des Epizooties (both relating to international animal health).

3.3.2.2 Areas where these models agree

Throughout the literature, and in each of these above-mentioned documents, there is general agreement about broad approaches to risk management[12] (see Figure 8), which includes:

- Risk assessment – the identification of potentially adverse events, and assessment of these events in terms of likelihood and consequence
- Risk management – the development of strategies (as required) to reduce risk to acceptable levels
- Risk communication - focusing on improved understanding of the process and of risk management decisions (Toma et al., 1999).

In the above-mentioned documents, the risk assessment process is described and defined slightly different but ultimately use the same set of steps to assess a risk.

[12] Risk management terminology is not used consistently among disciplines. In veterinary science, for example, 'risk analysis' replaces 'risk management' as the broad term encompassing risk assessment, risk management and risk communication. In other disciplines, 'risk treatment' is sometimes preferred over 'risk management' as the term to encompass the development of risk mitigation strategies.

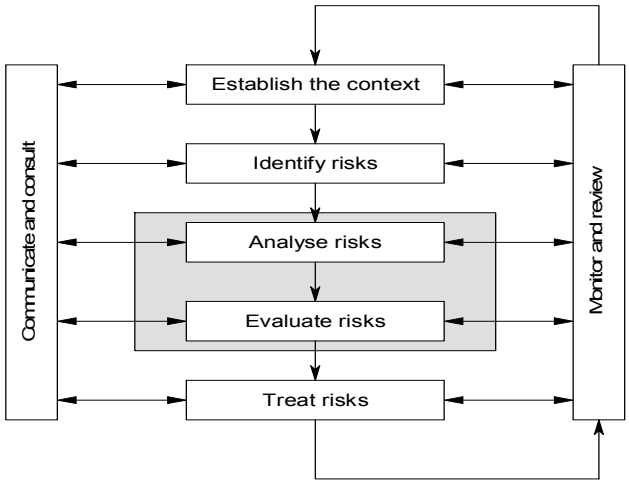


Figure 8: Risk management pathway (Standards Australia, 1999)

SUMMARY: There is general agreement about the approach to risk management, which should include risk assessment, risk management and risk communication.

3.3.2.3 Areas where these models do not agree

Although there is general agreement in most areas of risk management, in the above-mentioned documents a number of different approaches to risk assessment are described:

- In the Australian/New Zealand Standard for Risk Management (Standards Australia, 1999), risk assessment is considered to encompass risk identification *(identifying the events that may affect the objectives of an organisation)*, risk analysis *(critical evaluation of the likelihood and consequence – the risk – of each of these events)* and risk evaluation *(developing a prioritised list of risks for further action)*.
- In documentation from the European Commission (European Commission, 2000), the key components of risk assessment are considered to include hazard identification *(identifying the hazards – such as an infectious or toxic agent – capable of causing an adverse event)*, hazard characterisation *(quantifying the effects of each hazard)*, exposure assessment *(determining the likely level and duration of exposure to the hazard)*, and risk characterisation *(estimating likelihood and severity of adverse effects, based on estimated exposure and hazard characterisation)*.
- In documentation from the OIE (OIE, 2003), disease risks associated with importation of animals and/or by-products are conducted after considering hazard identification *(identifying disease agents that may be imported)*, release assessment *(the likelihood of a hazard being introduced into a country)*, exposure assessment *(the likelihood of susceptible animals being exposed to the hazard if it were introduced)*, and consequence assessment *(the potential impacts of a hazard if it were established in a country)*.

It is important to note that the initial document (from Standards Australia) provides a generic approach to risk assessment, being purposefully independent of any industry or economic sector. In contrast, the latter two documents are highly specific, presenting methodologies of risk assessment

for defined situations. Nonetheless, there is general acceptance in all documents regarding the fundamental issues of risk assessment – namely, the identification, analysis and evaluation of hazards or events on the basis of risk. In the latter documents, there has been considerable adaptation of these generic themes according to the purpose of the risk assessment. For example and as acknowledged by the relevant committee, the approach in the EC document is specifically designed to assess risk to human or animal health from defined 'risk sources' (such as chemicals, micro-organisms and physical factors). Likewise, import risk analysis (described in the OIE document) is undertaken specifically to minimise disease risks associated with international trade. These approaches each relate to the risk assessment of a specific hazard or hazards, such as a chemical, infectious agent or physical factor.

SUMMARY: The reviewed risk management models each take a relatively generic approach to risk management and risk communication. Although the approach to risk assessment is generic within the Australian/New Zealand Standard, it has been significantly adapted in the latter models, reflecting the specialised nature of risk sources in different contexts.

3.3.3 Risk management in other industries

Approaches to risk management have been reviewed in a number of industries, in Australia and elsewhere, including:

- Correction Health Services, Hunter Health (each in Australia), Shire Pharmaceuticals and AstraZeneca (both based in the UK)
- Queensland Health, Gold Coast Water and the Department of Human Resources (Victoria)

In the first group of industries, strategies for risk management were developed with assistance from KPMG, an international advisory firm with specialist skills in this area. The second group of industries is reviewed for comparison.

The Australian/New Zealand Standard for Risk Management (AS/NZS 4360:1999 – currently under revision) has been used as the basis for risk management in all of these industries. Further, and in keeping with accepted international practice, this framework has then been adapted to address a specific industry context. In each of the former four industries, KPMG's role was to embed a risk management culture by assessing current risk management activities and developing a simple yet robust framework that allowed entities to manage, monitor and report on their strategic risks ciontinuously. During this process, KPMG also contribute tools, templates and information on *'what works and what doesn't'* (based on collective experience over many years) to ensure that the approach to risk management is practical and easily adopted. Further detail about risk management in the latter three industries is available as follows:

- Queensland Health (*Guidelines for Managing Risk in the Health Care Sector)*[13]*;*
- Gold Coast Water (*Water Quality Management System*)[14]; and
- the Victorian Department of Human Resources (*Code of Practice for Water Treatment Service Providers – Cooling Tower Systems)*[15].

[13] http://www.health.qld.gov.au/infectioncontrol/documents/pdf/Infection%20Control%20Program.pdf
[14] http://www.goldcoast.qld.gov.au/attachment/Environmental_Report_2000_pgs10_12.pdf
[15] http://www.legionella.vic.gov.au/downloads/0951201code_practice.pdf

It is important to note that many of the international standards (such as the Australia/New Zealand Standard for Risk Management) are generic, and specifically aim to provide guidance to organisations when developing their own approaches to risk management. Logically, it is expected that these frameworks will be modified by industries to meet specific needs, to address specific risks and to maximise adoption throughout any given organisation. In contrast, reports such as the *'The first report on the harmonisation of risk assessment procedures from the European Commission'* (reviewed previously) have been developed specifically to ensure greater harmonisation amongst already-adapted risk management frameworks. Although this latter document has been developed to address a specific need and may not be directly relevant to live export, it could assist the LESCO with the development of educational material and templates, and when conducting training courses on risk management.

SUMMARY: The Australian/New Zealand Standard for Risk Management is used as the basis of risk management in a diverse range of industries. This Standard has been developed with the intention that it will be modified by individual industries to meet specific needs, to address specific risks, and to maximise adoption throughout any given organisation.

SUMMARY: The recommendations from this review – namely, the adaptation of the Australian/New Zealand Standard for Risk Management – is consistent with the general approach is risk management within a diverse range of industries in Australia and elsewhere.

3.4 A new approach to risk management during live export

3.4.1 An appropriate risk management model

After considering each of the previous comments, it is clear that there is a need for a shift from a prescriptive standards approach. Logically, the risk management models (which are accepted internationally as appropriate approaches to risk management) deserve detailed consideration.

With respect to each of the reviewed models, the broad approaches to risk management (namely, the assessment, management and communication of risk) are relevant to all industries, including the live export trade. Further, each of the fundamental issues relating to risk assessment (that is, risk identification, analysis and evaluation) is also relevant. Logically, therefore, the methodology of the Australian/New Zealand Standard for Risk Management – with modification as required – is appropriate to this industry.

In contrast, there are sound reasons why the EC and OIE methodologies are not directly applicable in this context, as follows:

Hazard identification (that is, the identification of defined infectious or toxic agents) is central to the EC/OIE methodology. However, adverse health and welfare outcomes in live export[16] are not the result of a defined number of specific hazards, but rather as a consequence of the interaction of a complex web of risk factors at and between each stage of export. This is illustrated in

- **Figure 7**, which represents current knowledge of the web of risk factors leading to adverse health and welfare outcomes during live sheep export. The web of risk factors relating to live cattle export is very similar.

    - The EC/OIE methodology is also based on a sound understanding of the contributory effect of individual risk factors on adverse events. Although we have a reasonable understanding of the structure of these causal webs, our understanding of the magnitude of these risks within these causal webs remains very limited. To illustrate, although the causal web for feedlot-related salmonellosis is now understood, there is currently no quantitative information about the effect of various risk factors (such as the contributory effect of various combinations of farm, transport and feedlot factors) on the probability of disease occurrence. Similar comments are relevant to other adverse health and welfare outcomes during live export. Consequently, efforts towards hazard estimation (as required within the EC and OIE methodologies) would be speculative at best.

For these reasons, it is recommended that the management of animal health and welfare risks during live export be based on the methodology of the Australian/New Zealand Standard.

RECOMMENDATION 5: It is recommended that the management of animal health and welfare risks during live export be based on the methodology of the Australian/New Zealand Standards for Risk Management.

3.4.2 An outcome-based focus

It is recommended that the industry take an outcome-based approach to risk management. There are two reasons for this recommendation:

- It is consistent with the broader shift towards an outcome-based approach
- An outcome-based approach to risk management is also consistent with current knowledge of disease causation within this industry. As discussed in section 3.4.1, a hazard (or input) based approach (which is the logical alternative to an outcome-based approach to risk management) would be unworkable, given the large number of potential risk factors, and the limited knowledge about the contributory effect of each.

In simple terms, an outcome-based approach to risk management during live export should deliver each of the following:

- A clear and objective understanding of the adverse health and welfare outcomes that are most likely and of greatest consequence on any particular consignment

[16] Exporters need to manage a wide range of risks during export, including animal health and welfare, commercial issues and human health and safety. Given the context of this review, however, the current discussion relates solely to management of risks that impinge on animal health and welfare.

- A robust and appropriate series of strategies (in relation to the above-mentioned outcomes) that enable exporters to reduce risks to acceptable levels
- An effective and practical framework for continuous improvement throughout industry, underpinned by communication within industry, and between industry and government.

RECOMMENDATION 6: Consistent with the broad changes recommended within this review, it is also recommended that the industry take an outcome- (rather than a hazard-) based approach to risk management. In simple terms, an outcome-based approach to risk management during live export should deliver each of the following:

- *A clear and objective understanding of the adverse health and welfare outcomes that are most likely and of greatest consequence on any particular consignment*
- *A robust and appropriate series of strategies to enable exporters to reduce risks to acceptable levels*
- *An effective and practical framework for continuous improvement, underpinned by communication within industry, and between industry and government*

As a result of the previous recommendation and contrary to the original project brief, it is no longer appropriate to conduct a detailed critique of risk nodes from property-of-origin to discharge. Rather, using an outcome-based approach, best-available knowledge about causal webs and related risk factors should be used when developing risk management strategies for specific health and welfare outcomes. This is illustrated later in this document.

SUMMARY: A detailed technical assessment of the risk nodes from property-of-origin to discharge is not required as part of the proposed model for risk management. Rather, there is a need to utilise best-available knowledge about causal webs and related risk factors when developing risk management strategies for specific health and welfare outcomes.

3.4.3 The approach in detail

The previous recommendations have addressed each of the following:

- The need to move from an approach based on prescriptive standards, whilst also recognising the important role that they could play (to exporters and the community) as a means to achieve baseline practice throughout the industry;
- The need for an outcome-based approach to risk management, utilising international best-practice in the application of risk management methodology; and
- The recognition that knowledge is imperfect, particularly in terms of the contributory effect of individual risk factors on the development of adverse outcomes.

However, these recommendations – on their own – do not address each of the following issues:

- The need for risk management to be workable in a commercial setting;
- The need for risk management to adequately consider both biological and physical risks;
- The need for risk management to consider all of the outcomes that may have an adverse effect on health and welfare. For example, although the direct impact of scabby mouth on health and welfare are generally small, the indirect impact could be extremely large if it were to form the basis of rejection at a planned port of discharge;
- The recognition that some aspects of the trade are at greater risk of adverse health and welfare outcomes than others;
- The recognition that the risk environment is under constant flux, which is certain to require ongoing changes in focus and/or emphasis with respect to risk management;
    - The need for close linkages between all levels of industry, and between industry and government, with respect to risk management; and
- The need for industry-level continuous improvement in risk management.

In response to these additional issues, the reviewers recommend that risk management be undertaken using the following stepped approach:

A. For all consignments

- *A mandatory requirement that each exporter complies with 'standards of baseline practice'.* These standards would be similar to the existing ALES, but with periodic revision to reflect new knowledge

B. For all consignments to the Red Sea and/or Persian Gulf

- *A mandatory requirement that each exporter adequately manage heat stress risk.*

C. For all consignments considered at 'high-risk'

- *A mandatory requirement that each exporter develop a consignment risk management plan.*

Each of these components of the new approach to risk management, as well as the definition of a 'high risk' consignment, is considered in detail later.

RECOMMENDATION 7: It is recommended that risk management be undertaken during live export as follows:

- *For all consignments, there is a mandatory requirement that each exporter complies with 'standards of baseline practice';*
- *For all consignments to the Red Sea and/or Persian Gulf, there is a mandatory requirement that each exporter adequately manage heat stress risk; and*
- *For 'high-risk' consignments, there is a mandatory requirement that each exporter develop a consignment risk management plan.*

3.4.3.1 Standards of baseline practice

As indicated in the LEAP Handbook (LiveCorp, 2001), the Australian Livestock Export Standards is currently considered the minimum standards for achieving acceptable animal welfare when exporting cattle, buffalo, sheep and goats from Australia. Key features of these standards include:

- A combination of practical industry experience and scientific knowledge gained from research involving the livestock export trade;
- Consideration of all stages of live export;
- The inclusion of mandatory requirements and "best-practice" recommendations; and
- A process of ongoing review and changes based on new information.

Although there is a need to move from prescriptive standards, it is also logical that the current ALES documentation be retained as *'standards for baseline practice'.* Key reasons for their retention include:

- The *'standards of baseline practice'* provide exporters with good-practice guidelines;
- The *'standards'* will enable industry to capitalise on the collective expertise that has already been captured in the most recent ALES review and its documentation;
- The *'standards'* will ensure that basic tenets of animal welfare (such as space to move, quantity and quality of feed and water etc) are acceptable during live export; and
- The *'standards'* will provide the general community with an assurance that a baseline level of acceptable practice is being implemented on all consignments.

Some minor modification of the ALES documentation will be required, as discussed elsewhere.

> *RECOMMENDATION 8: It is recommended that the current standards be retained as 'standards of baseline practice', and become mandatory for all consignments as part of the new approach to risk management during live export.*

3.4.3.2 Management of heat stress risk

Heat stress can be a significant health and welfare concern during live export, particularly when animals are shipped from cool regions of Australia to very hot regions of the world. In response to these concerns, LiveCorp has commissioned a number of detailed research projects relating to heat stress during live export, including:

- Investigation of ventilation efficacy on cattle (Stacey, 2000; Stacey, 2001) and sheep (Stacey and More, 2002a; Stacey and More, 2002b; Stacey and More, 2002c) vessels
- Practical ventilation measures for livestock vessels (Stacey, 2002)
- Investigation into mortalities during voyage 1 of the MV Becrux (More, 2002b)

As a practical outcome of this research program, the HS software has recently been developed for the industry to effectively manage the risk of heat stress during live export from Australia (C. Stacey, personal communication). To this point, the software is only relevant to consignments exported by sea and destined for ports in the Red Sea and Persian Gulf.

Given this background, it is recommended that management of heat stress risk become mandatory on all consignments sent by ship to ports in the Red Sea and Persian Gulf. As more data become available, there may be a need for LESCO to extend this requirement to other consignments . It is important to note that animals are required to transit hot equatorial waters during most export voyages and may also be unloaded during a hot northern summer.

During the management of heat stress risk, an exporter would be expected to undertake the steps of risk management and risk communication. Risk assessment is not relevant in this context (in contrast to risk management planning as discussed below) because the adverse outcome (that is, heat stress) is already clearly defined. Heat stress develops as a result of a complex web of physical and biological risk factors. Logically, the management of heat stress is complex, and requires detailed consideration of a range of factors. The HS software automates this process, enabling exporters to minimise heat stress risk by altering a range of factors including ship selection and/or engineering, stock type, stock source, stocking densities and destination. It is recommended that exporters manage heat stress risk using this software, or an equivalent and justifiable methodology.

RECOMMENDATION 9: As part of the new approach to risk management, it is recommended that heat stress risk management become mandatory for all consignments destined for ports in the Red Sea and/or Persian Gulf. It is also recommended that this be undertaken by exporters using the HS software, or an equivalent and justifiable methodology. As more data becomes available, there may be a need for LESCO to extend this requirement to other destinations where there is also a risk of heat stress.

3.4.3.3 The consignment risk management plan

In general

It is anticipated that most risks will be managed through adherence to baseline practice and heat stress risk management. However, because there have been a number of recent examples of mortality problems (for reasons other than heat stress) despite full compliance with LEAP, it is certain that these strategies will not be sufficient to adequately manage all risks in all situations. Logically, therefore, additional risk management efforts are required on consignments considered at 'higher-than-average' risk (so-called 'high-risk consignments).

Given this background, it is recommended that a risk management plan (known as a consignment risk management plan) be prepared for all 'high-risk' consignments. Each plan would be linked to a defined consignment, and would provide documented evidence that individual exporters have completed a well-defined series of steps relating to risk management. Each plan should aim to reduce the risk (to acceptable levels) of adverse health and welfare outcomes during a particular consignment.

RECOMMENDATION 10: It is recommended that consignment risk management planning become mandatory for all 'high risk' consignments as part of the new approach to risk management during live export. Each plan would be linked to a defined consignment, and would provide documented evidence that individual exporters have completed a well-defined series of steps relating to risk management. Each plan should aim to reduce the risk (to acceptable levels) of adverse health and welfare outcomes during a particular consignment.

'High risk' consignments

'High-risk' consignments can be defined as all consignments that are at increased risk of one or more adverse health and welfare outcome. *Based on current knowledge,* a number of consignments are at higher-than-average risk, including:

- Consignments of *Bos taurus* cattle loaded in southern ports (that is, Australian ports situated below 26^{o} south). The health and welfare problems with these consignments will largely be controlled through management of heat stress risk. Additional risk management planning would only be required where additional – mainly biological risks – are considered important
- Goats
- Sheep that have been held in a paddock-based feedlot without covered troughs prior to loading
- Sheep that are full-mouth, fat (score 4+) and shipped in the second half of the year
- Other consignments which could reasonably be considered at higher-than-average risk, including those:
  - prepared by exporters with limited experience of live animal export, either generally or with respect to specific animal-types or export-methods;
  - with links to previous, poorly-performing consignments; and
  - where rejection-at-destination is considered a reasonable possibility.

It will be a key responsibility of the LESCO to regularly review these 'high-risk' criteria. Information relevant to such a review would include:

- Objective mortality summaries, which are produced on a yearly basis for LiveCorp and MLA (for example Norris and Norman, 2001; Norris and Norman, 2002a; Norris and Norman, 2002b);
- Emerging R&D information; and
- General market intelligence.

SUMMARY: A number of consignments can be considered at higher-than-average risk of adverse health and welfare outcomes, based on accumulated data. At present, 'high risk' consignments could include those with southern Bos taurus *cattle, goats, sheep held in paddock-based feedlots without weather-protected feed troughs, as well as older and fatter sheep shipped in the second half of the year. Other consignments at 'high risk' include those that have been prepared by exporters with limited experience, those with links to earlier poorly-performing consignments and those where rejection-at-destination is considered a real possibility. LESCO should regularly review the 'high-risk' criteria, based on objective mortality summaries, emerging R&D information and general market intelligence.*

During the preparation of this review, an argument was put forward that overt risk management planning be undertaken on every consignment (eg, 'all consignments have risks so why not a tailored plan for every consignment?'). We agree that every consignment should be supported by baseline risk management planning. However, only those consignments facing high *a priori* risk should be accompanied by overt planning. Our reasoning for making this distinction are several:

- Risk management planning is certain to become less meaningful if conducted uniformly, regardless of perceived risk; and
- The suggested approach would devalue the proposed role of LESCO, which will play a central role in overall industry risk management including ongoing adjustment of the 'high-risk' criteria, in response to ongoing assessment and industry intelligence.

Components of the risk management plan

In accordance with earlier discussions and relevant documentation (Standards Australia, 1999; KPMG, undated), the risk management plans should include each of the following steps:

- Risk assessment, including risk identification *(identifying risks associated with a particular consignment),* risk analysis *(estimating likelihood and consequence for each risk)* and risk evaluation *(prioritising risks in order of importance);*
- Risk management (or treatment), to identify and assess treatment options as well as preparing risk treatment plans; and
- Risk monitoring and communication, in keeping with best-practice.

SUMMARY: The consignment risk management plan should include:

- *Risk assessment, including risk identification, risk analysis and risk evaluation*
- *Risk management*
- *Risk monitoring and communication*

Detailed information about the development of a consignment risk management plan is presented below.

3.4.4 The responsibilities and actions of individual exporters

3.4.4.1 Responsibilities

As part of the new approach to risk management, individual exporters will be required:

- *For all consignments:* to comply with the '*standards for baseline practice*'.
- *For all consignments destined for ports in the Red Sea and/or Persian Gulf:* to adequately manage heat stress risk, using the HS software or an equivalent and justifiable methodology. This requirement may be extended by LESCO to other destinations, as further data becomes available.
- *For all 'high-risk' consignments:* to prepare a robust and considered consignment risk management plan using accepted methods, as discussed later. The 'high-risk' criteria will be periodically reviewed by LESCO, as further data becomes available.

Prior to the export of any consignment, exporters are required – where relevant – to provide LESCO with:

- Written evidence to support adequate management of heat stress risk; and
- A written copy of the consignment risk management plan.

These consignments will be reviewed by LESCO, as detailed later.

3.4.4.2 Development of a consignment risk management plan

As stated previously, each plan is linked to a defined consignment. They provide documented evidence that individual exporters have completed a well-defined series of steps relating to risk management, with the aim to reduce the risk (to acceptable levels) of adverse health and welfare outcomes during a particular consignment. Reflecting the complex nature of the trade, and the need for the plan to be based on best-available technical information, it is critical that the plan is developed collaborative, using both technical and non-technical input. The accredited veterinarian is an important technical resource and would be expected to play an important technical role during plan development.

> *SUMMARY: The risk management plan should be developed collaboratively, using both technical and non-technical input. The accredited veterinarian is expected to play an important technical role during plan development.*

It is recommended that each risk management plan be developed as two related parts, including:

- *PART A:* the identification, analysis and evaluation of animal health and welfare risks associated with a specific consignment; and

- *PART B:* the identification and assessment of risk treatment options, and the development of a detailed plan to manage the most-important risks.

> *RECOMMENDATION 11: It is recommended that consignment risk management plans follow an agreed proforma, and include:*
>
> - *PART A, to identify, analyse and evaluate animal health and welfare risks*
> - *PART B, to identify and assess risk treatment options, to develop a detailed plan to manage the most-important risks.*
>
> *RECOMMENDATION 12: As part of the new approach to risk management, it is recommended that the responsibilities of individual exporters include:*
>
> - For all consignments: *to comply with the 'standards for baseline practice'.*
> - For all consignments destined for ports in the Red Sea and/or Persian Gulf: *to adequately manage heat stress risk, using the HS software or an equivalent and justifiable methodology.*
> - For all 'high-risk' consignments: *to prepare a robust and considered consignment risk management plan using accepted methods.*

The development of a consignment risk management plan is illustrated in this document using two methods:

- Detailed (theoretical) information is presented in **Appendix 1**
- A practical example of plan development is presented below, based on a specific scenario.

Consider the following scenario:

> *An exporter is wishing to assemble a consignment of sheep for the Middle East, departing Portland in September. Conditions have been good in south-western Victoria, and the consignment will include a substantial proportion of full-mouth Merino wethers in good condition. Based on past experience, there is a risk that mortality rates will exceed specified threshold. Likely causes of mortality in these animals could include feedlot-related salmonellosis and persistent inappetence-salmonellosis-inanition (PSI).*

Note that this consignment would be considered high risk, because these sheep will be held in a paddock-based feedlot prior to export, and also because the consignment will include full-mouth, fat (score 4+) sheep exported during the second half of the year. Consequently, a risk management plan would be required.

PART A of the plan

PART A of the consignment risk management plan is a three-stage process, where an exporter is specifically asked to address each of the following issues:

- What are the health and welfare risks that could be associated with this consignment?
- Score each risk in terms of likelihood and consequence.

- What risks are the most important?

Figure 9 illustrates a completed consignment risk management plan (PART A), for the earlier scenario.

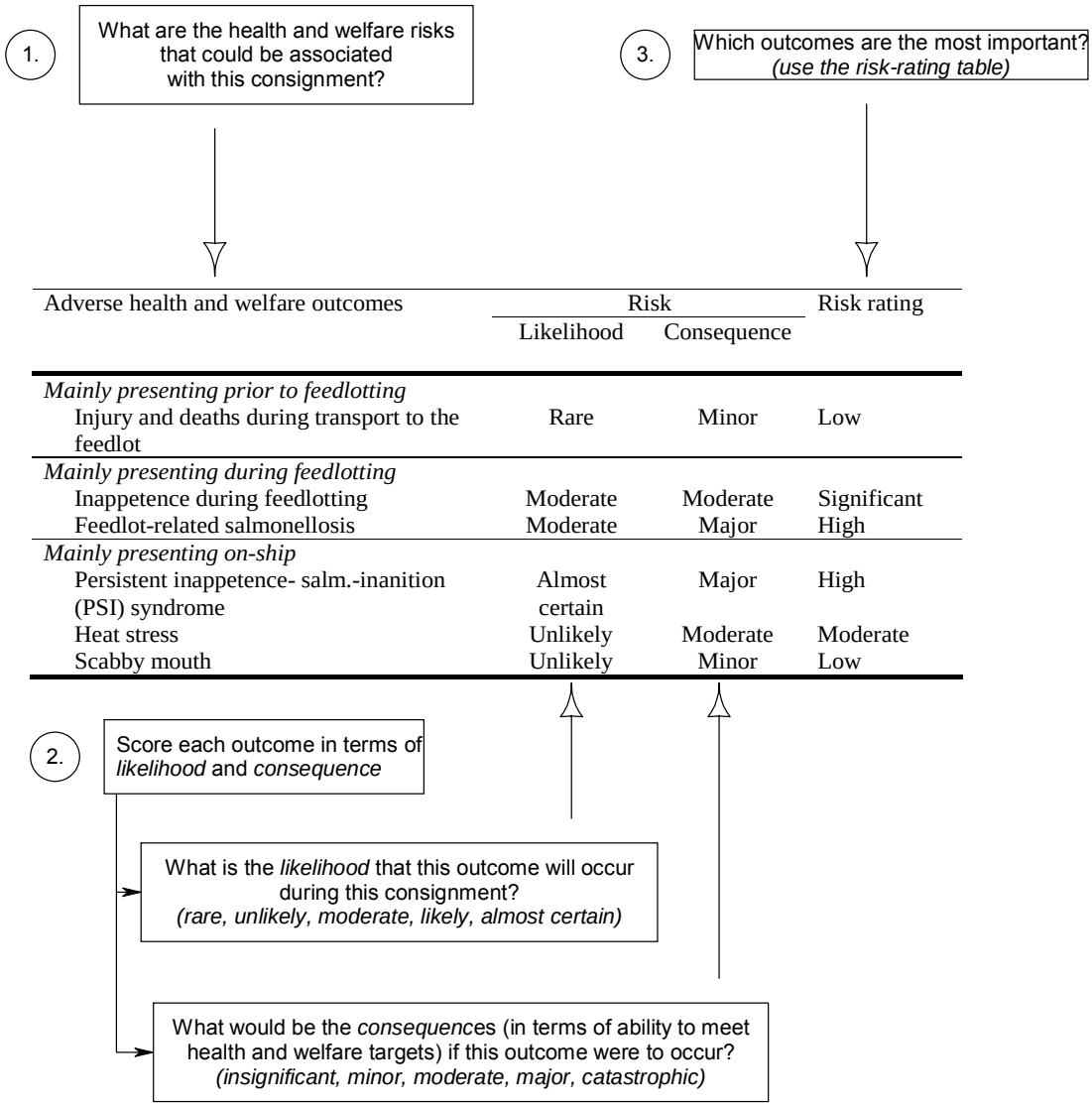


Figure 9: Part A of the risk management plan

PART B of the plan

In the consignment risk management plan (PART B), the exporter is asked to provide detailed information about strategies to be adopted to manage each of the outcomes considered 'significant' or 'high' in the PART A form. A separate PART B form will be is required for each of these outcomes. Figure 10 illustrates strategies used to manage the risk of PSI complex in the above-mentioned scenario. In this example, additional PART B forms would be required for inappetence during feedlotting and feedlot-related salmonellosis.

A separate PART B sheet is required for each of the outcomes considered *'significant'* or *'high'*

RISK MANAGEMENT PLAN (PART B)

Identified outcome PSI complex	**Exporter:** Joe Bloggs **Consignment:** Voyage 135 of Ship X

Risk treatment

A brief description of strategy(ies) to minimise this risk, and evidence to support its effectiveness

1. Treatment option(s) to be used

Exclude heavy, fat wethers from this consignment

2. Evidence in support of the effectiveness of these options

Based on available evidence, the risk of PSI is 'fixed' at the time animals leave the property of origin and no treatment has been proven to subsequently reduce PSI risk in these animals. For these reasons, PSI can only be minimised by reducing the probability of including high-risk animals in this consignment.

Action plan

The action plan, addressing practical issues including: *what, using what resources, by whom, when* and *with what monitoring*

1. Proposed action

a. Seek confirmation from LiveCorp about the classes of animals at significant risk of PSI
b. Advise all buyers of strict specification requirements (excluding all full-mouth sheep, sheep with condition score 4 or above)
c. Exclude all out-of-specification animals on-arrival at feedlot
d. Seek LiveCorp's assistance with longer-term education of farmers/agents in this region

2. Resource requirements

Minimal, relying on existing resources and processes

3. Responsibilities

JB responsible for actions a., c. and d.
AB responsible for action b.

4. Timing

August 1: LiveCorp contacted re. latest information on PSI, assistance re. longer-term education of Victorian farmers
August 7: All agents/buyers advised of final specifications
August 24: Final briefing to staff prior to feedlot arrival

5. Reporting and monitoring required

Exporter's representative to provide information about out-of-specification rejection on arrival at feedlot, including % rejected and details of consignments (agents/buyers involved). All relevant agents/buyers to be contacted

Compiler Joe Bloggs	Date 1 August

Figure 10: Part B of the risk management plan

Managing specific health and welfare outcomes

As indicated previously, strategies for effective risk management must be based on best-available technical information, including knowledge about causal webs and related risk factors. However, plans are also influenced by a wide range of practical issues specific to individual exporters. Because

technical and non-technical issues must both be considered during plan development, it is not possible to develop a series of 'ready-made' plans that are suitable for all situations.

SUMMARY: Strategies for effective risk management must be based on best-available technical information, including knowledge about causal webs and related risk factors. However, plans are also influenced by a wide range of practical issues specific to individual exporters. Because technical and non-technical issues must both be considered during plan development, it is not possible to develop a series of 'ready-made' plans that are suitable for all situations.

In the following section, technical information is presented about adverse health and welfare outcomes that are considered most-important during live export. Although circumstances will vary, effective risk management should consider each of the risk factors, known or likely-associated with the relevant outcome. This information should be reviewed annually by the LESCO, and further outcomes added, as further detail from industry and the scientific community becomes available.

SUMMARY: The report provides summary information, including known and likely risk factors, about the most important adverse health and welfare outcomes that are known to affect animals during live export, including transport injury, cold stress, feedlot-related salmonellosis, persistent inappetence-salmonellosis-inanition, heat stress and bovine respiratory disease. This information should be reviewed annually by the LESCO, as further detail becomes available.

Transport injury

Background

Although transport injury is relatively rare, particularly during transport of sheep (Norris et al., 1989)and cattle, it may be an ongoing problem during goat transport, particularly following wild capture (More and Brightling, 2003). Water curfews are used widely in the live export industry to minimise the risk of transport injury (More, 2002c).

Known and likely risk factors

A. Truck factors

- Age, general design, level of maintenance

B. Management factors

- General standard of management, including commitment to quality assurance and continuous improvement

C. Consignment factors

- Curfewing strategies prior to transport, stocking density, duration/distance travelled, care during drafting and general organisation

Cold stress

Background

Cold stress has been an important cause of sporadic losses during live export, particularly in goats and in sheep off-shears. Although the problem is currently well-managed, it may re-emerge as a significant problem with increased interest in live goat exports and the gradual advance in timing of the hajj shipments to the Middle East (More and Brightling, 2003).

Known and likely risk factors

A. Animal factors

- Species (sheep/goats), age, condition score, shearing history
- Property-of-origin

B. Factors relating to management and facilities

- Climatic *(long-term)* and weather *(short-term)* factors, including wind, rain and temperature
- Transport facilities and practices
- Feedlot/holding facilities, including location and provision for shelter
- General standard of management including shearing practices and feeding systems and strategies

Feedlot-related salmonellosis

Background

Feedlot-related salmonellosis is now recognised as an important, if sporadic, cause of mortality in sheep and goats during live export. Detailed information about this condition is available, based on recent (More, 2002d; More, 2002c) and earlier (Kelly, 1996) research. Outbreaks generally occur several days after arrival at the feedlot, and may continue for some days after the start of the sea-voyage. The problem is mainly limited to paddock-based feedlots, and is often associated with inclement weather.

Known and likely risk factors

A. Factors leading to reduced host resistance *(considered the more important factor)*

- Curfewing strategies prior to transport
- Feeding, including systems and strategies to maximise the consistency of feed intake after arrival
- Duration of feedlotting
    - Inclement weather, including strategies to minimise impact
- Sheep quality

B. Factors leading to increased *Salmonella* challenge

- Feedlot throughput, general feedlot hygiene
- Feeding, including systems and strategies to minimise faecal contamination
- Management of newly-introduced animals
- Prophylactic and therapeutic use of antimicrobial agents

Persistent inappetence-salmonellosis-inanition

Background

Persistent inappetence-salmonellosis-inanition (the PSI complex) is now well-recognised, based on detailed work in Western Australia (for example Norris et al., 1989; Richards et al., 1989; Norris et al., 1990; Richards et al., 1991) and, to a lesser extent, in Victoria (Kelly, 1996). Current knowledge about PSI complex has been summarised by More (2002d).

The PSI complex is probably the most-important cause of deaths during live export of sheep from Australia. The complex is multifactorial, with many risk factors contributing to its development. Affected animals refuse to eat after leaving the property-of-origin, and eventually succumb from salmonellosis or inanition (starvation in the face of plenty). Seasonal cycles in appetite and fat metabolism are likely to be the underlying causes of the complex (Higgs et al., 1991; Richards et al., 1991).

Known and likely risk factors

A. Risk factors associated with the line of sheep *(known to be the most important risk factors for this complex)*

- Degree of adiposity, age, season of export

B. Risk factors relating to the farm-of-origin

- Still uncertain, but includes property location (possibly climatic and pasture effects)

Practices during feedlotting and on-ship are not thought to play an influential role in the development of this condition.

Heat stress

Background

Heat stress is recognised as the most important cause of death in cattle during live export. It was the primary cause of death during the maiden voyage of the *MV Becrux* (More, 2002b), the likely cause of death in several other high-mortality incidents, and the most important cause of death during four recent research voyages (Norris et al., 2003). *Bos taurus* animals, during long-haul voyages, are particularly susceptible to heat stress. There is some debate about the importance of heat stress during live export of sheep and goats

Known and likely risk factors

The causal web for heat stress is well-understood, following the completion of several recent research projects (Stacey, 2000; Stacey, 2001; Stacey, 2002; Stacey and More, 2002a; Stacey and More, 2002b; Stacey and More, 2002c). Because the causal web is complex, it is recommended that

risk management be undertaken using software that was recently developed for this purpose (C. Stacey, personal communication).

Key risk factors include the following:

A. Animal factors

- Breed, age, sex, weight
- Acclimatisation factors, including location of property-of-origin, time of year, climatic influences during the previous two months.

B. Ship factors

- Ship design, including open/closed decks, facilities for wash-down and ventilation efficacy (measured at pen air turnover) on each deck
- Pen design and configuration, including use of tiers, stocking density, access to water
- Relevant experience of captain, crew and attending veterinarian and/or stockman

C. Environmental factors

- Climatic and weather, during voyage and at port(s) of discharge

Bovine respiratory disease

Background

Bovine respiratory disease (BRD) is a very important cause of wastage in the Australian feedlot industry (More, 2002a). During some live export consignments, BRD is considered an important cause of morbidity (illness). Further, bovine respiratory disease (BRD) was identified as the third-most common cause of death in cattle during live export, accounting for 34 deaths per 10,000 cattle loaded during four research voyages to the Middle East (Norris et al., 2003). The cause of BRD is not yet completely understood, but is known to be complex and multifactorial.

Known and likely risk factors

A. Factors likely to compromise normal immune defence mechanisms, including:

- Environmental stressors, such as fluctuations in temperature
- Nutritional stressors
- Physiological and social stressors, including mixing of animals from multiple sources
- Management stressors

B. Other important risk factors, including age and ventilation

C. Vaccination history

3.4.5 The responsibilities and actions of the Livestock Export Standards and Compliance Organisation

3.4.5.1 Responsibilities

As part of the new approach to risk management, the Livestock Export Standards and Compliance Organisation will be required:

- To provide leadership for risk management throughout the live export industry; and
- To manage the industry's risk R&D program.

3.4.5.2 Leadership of industry risk management

It is recommended that LESCO play a pivotal role by leading all aspects of risk management throughout the live export industry, as follows:

- Providing vision, sponsorship and direction throughout industry in the area of risk management, thereby ensuring that:
  - the principles and methods of risk management are effectively understood by all relevant industry people,
  - risk management methods are consistently applied; and
  - adverse health and welfare outcomes are effectively managed by individual exporters.
- Promoting a positive attitude towards risk and risk management, and a genuine commitment to continuous improvement, at all levels of industry.
- Developing relevant resources, including training opportunities and risk management guidelines/templates, as necessary.

RECOMMENDATION 13: It is recommended that the LESCO provide risk management leadership to industry, with the following responsibilities:

- *Providing vision, sponsorship and direction of all risk management activities;*
- *Promoting a positive attitude to risk and risk management and a commitment to continuous improvement; and*
- *Developing relevant resources, including training opportunities, as necessary.*

Further, it is recommended that the Livestock Export Standards and Compliance Organisation fulfil two key roles with respect to risk management, as follows:

- *Leadership of all aspects of risk management throughout the live export industry; and*
- *Development and management of the industry risk management development program.*

3.4.5.3 Development and management of the industry risk management development program

In addition to leadership responsibilities, the LESCO would also be responsible for the development and management of the industry *'risk management development program'*. This program is expected to be broad in scope, but with the specific purpose of facilitating continuous improvement in the effectiveness of risk management throughout industry. It is recommended that the program be broken into two sub-programs:

- *Current operations:* An ongoing critical evaluation of current approaches to risk management throughout industry; and
- *Future directions:* An assessment of short- and longer-term changes that will impact on industry, including the development of effective risk management strategies in response to these changes.

> *RECOMMENDATION 14: It is recommended that the LESCO also develop and manage an industry 'risk management development program', with the specific purpose of facilitating continuous improvement in the effectiveness of risk management throughout industry. It is recommended that the program include two sub-programs, as follows:*
>
> - Current operations, *encompassing an ongoing critical evaluation of current approaches to risk management throughout industry; and*
> - Future directions, *encompassing an assessment of short- and longer-term changes that will impact on industry, including the development of effective risk management strategies in response to these changes.*

A. Current operations

The objectives of this sub-program are to ensure that:

- Risk management is being developed and applied consistently throughout industry, and is in line with the expectations of government and the wider community;
- Risk management (both in general terms and with respect to specific risk mitigation strategies) is consistent with ongoing advances in knowledge. The LESCO would be expected to periodically review the content of the *'standards of baseline* practice', the destinations requiring management of heat stress risk and the 'high-risk' criteria relating to risk management planning.
- Consignment risk management plans are appropriate and pragmatic[17,18] with risk mitigation strategies benchmarked against industry best-practice[19], thereby encouraging continuous improvement.

[17] During a review of individual consignment plans, each of the following issues should be considered:

- *Is the risk management plan effective in minimising the risk (that is, has the plan worked)?*
- *Do the performance measures or indicators reflect the key outcomes?*
- *Are the assumptions, including those made in relation to the environment, technology and resources, still valid?*
- *Is the risk management plan comparatively efficient/cost effective?*

- Adequate monitoring is provided throughout the live export supply chain to assess risk management issues.

Expected outcomes from this sub-program would include:

- *Consistent application of risk management throughout industry, and improved and increasingly proactive industry alignment with government and community expectations*
- *Robust and appropriate use of risk management at all levels of industry*
- *Improved understanding and communication of adverse animal health and welfare outcomes, and of appropriate risk management strategies (through benchmarking) consistent with ongoing advances in knowledge*
- *Focused and informed feedback throughout all levels of industry*
- *A developing industry culture of continuous improvement, in terms of risk management*

SUMMARY: The 'Current operations' *sub-program of the industry risk management development program will be developed and managed by the LESCO. Expected outcomes from the sub-program will include consistent, robust and appropriate use of this methodology, improved alignment to government and community expectations, improved understanding and communication of adverse animal health and welfare outcomes and of appropriate risk management strategies, focused and informed feedback, and a developing industry culture of continuous improvement.*

B. Future directions

This sub-program has two main aims:

- To critically evaluate existing risks, identifying short-term changes and potential responses in the industry risk profile, with respect to animal health and welfare; and
- To forecast longer-term changes in the industry risk profile, with respect to animal health and welfare, and to respond to these forecasts as appropriate.

Expected outcomes from this aspect of the program would include:

- *Does the risk management plan comply with legal requirements, government and community expectations?*
- *How can improvements be made?*

[18] The LESCO will not be responsible for the development of consignment risk management plans – this will remain the responsibility of individual exporters. However, it will be the responsibility of the LESCO will be to develop examples of what are considered acceptable risk management plans for specific circumstances. These model plans will be used during the risk management audit process to benchmark individual exporter's consignment risk management plans.

[19] Results from benchmarking, including the identification of superior risk management strategies, will be communicated via risk alerts, newsletters and bulletins to all relevant industry bodies and individuals.

- *Understanding and communication of short- and longer-term changes in the industry risk profile, with respect to animal health and welfare*
- *Appropriate response to these changes, including – as appropriate, informed support for relevant future R&D*

> *SUMMARY: The* 'Future directions' *sub-program of the industry risk management development program will be developed and managed by the LESCO. Expected outcomes from this sub-program will include an understanding and communication of short- and longer-term changes in the industry risk profile, with respect to animal health and welfare, and appropriate responses to these changes, including – as appropriate – informed support for relevant future R&D.*

For each of these sub-programs, the LESCO is likely to require data from a number of sources, including:

- The consignment risk management plans for each consignment;
- Related documentation, including measured outcomes, existing processes such as reports from accredited veterinarians and shipboard stockmen, audit reports (discussed in detail later) and critical incident reports; and
- Additional resources, as required, including expert opinion and commissioned R&D.

4 MANAGING INCIDENTS

4.1 Introduction

By definition, an incident is deemed to have occurred if defined animal health and welfare outcomes exceed pre-determined thresholds. Within the live export trade, incidents are generally associated with high mortality events during the on-ship phase of export, such as:

- A voyage mortality rate for sheep and goats of greater than 2% of the consignment
- A voyage mortality rate for cattle and buffalo of greater than 1% of the consignment (LiveCorp, 2001).

As indicated previously, it is recommended that mortality remain the primary outcome-of-interest during live export. However, because the export process includes more than just the seaward journey, it is recommended that similar mortality thresholds are developed for other relevant intervals during live export, including:

- Farm-of-origin to feedlot;
- Feedlot; and
- Feedlot to export vessel.

SUMMARY: An incident is deemed to have occurred when the mortality rate exceeds a pre-determined threshold. Mortality thresholds have been determined for the shipboard period of export. Similar thresholds need to be determined for the other stages of the live export process, including:

- *Farm-or-origin to feedlot;*
- *Feedlot; and*
- *Feedlot to export vessel.*

It is recognised that two different types of incidents can occur:

- *Major incidents*: These are distinguished by a very high mortality rate and close public scrutiny. Furthermore, there is general agreement, given the need for 'damage control' and intervention by the federal Minister, for any response to be undertaken on the basis of cooperation between government and industry. Cooperative arrangements for the investigation of major incidents are currently being developed by industry and government.
- *Minor incidents*: These involve mortality rates that exceed pre-agreed thresholds, but where government involvement is not considered necessary. Minor incidents do not attract sustained public interest. Regardless of magnitude, AQIS will retain the right to independently investigate any incident (major or minor) if it deems this to be in the public interest.

The following recommendations relate specifically to minor incidents. Although minor incidents may not attract sustained public interest, they do highlight failure in the planning or implementation of risk management strategies on specific consignments. *To facilitate continuous improvement throughout the industry, it is critical that all minor incidents are investigated.*

SUMMARY: This report considers options for managing minor incidents, where agreed mortality thresholds have been exceeded but government involvement is not considered necessary. Major incidents, which are not considered here, can be distinguished by a very high mortality rate and close public scrutiny. It is anticipated that responses to major incidents will be undertaken on the basis of cooperation between government and industry.

4.2 Investigating minor incidents

4.2.1 Routine data collection

To maximise the value of an incident investigation, it is critical that data are routinely collected with care and purpose. Therefore, it is recommended that the following data are collected during each sea voyage:

- The total number of animals loaded, by species, class, deck and port of loading
- The total number of animal deaths, by species, class, deck, port of loading and date
- Daily environmental data, including wet-bulb temperature (either directly or from dry-bulb temperature and relative humidity)

Further detail, including collection, management and analysis of these (and other routinely-collected) data is provided in **Appendix 2**. Implementation of this recommendation should be a responsibility of LESCO, and is certain to involve the accredited stockmen.

RECOMMENDATION 15: To maximise the value of an incident investigation, it is recommended that the following data are collected during each sea voyage:

- *The total number of animals loaded* by species, class, deck and port of loading
- *The total number of animal deaths* by species, class, deck, port of loading and date
- *Daily environmental data, including wet-bulb temperature (either directly or from dry-bulb temperature and relative humidity)*

4.2.2 Terms of reference

Each of the following terms of reference needs to be addressed during the investigation of a minor incident:

1. Identification of the cause(s) of the incident, including an understanding of all contributing factors;

2. Assessment of the adequacy of risk management strategies[20] relevant to this consignment; and

3. Development of recommendations on how the exporter, and as relevant the broader industry, should handle future consignments, in the light of lessons learned from this investigation.

> *RECOMMENDATION 16: It is recommended that minor incident investigations address each of the following terms of reference:*
>
> - *Identification of the cause of the incident, including an understanding of all contributing factors;*
> - *Assessment of the adequacy of relevant risk management strategies; and*
> - *Development of recommendations on how future consignments should be handled, on the basis of 'lessons learned'.*

4.2.3 The investigation team

The investigation should be undertaken by at least one person, with the following skills, attributes and experience:

- An Australian-registered veterinarian, preferably with post-graduate qualifications in an area relevant to incident investigation and reporting
- Comprehensive understanding and practical knowledge in the fields of veterinary epidemiology, pathology, clinical medicine of ruminants and animal welfare
- Detailed understanding and experience in the investigation of significant animal health and welfare incidents
- A sound understanding of live animal export
- Commitment to excellence, scientific rigour, timeliness and independence
- Comprehensive skills in technical report writing

> *RECOMMENDATION 17: It is recommended that the investigation team, involving one or more people, should be selected on the basis of skills, attributes and experience.*

[20] As described previously, risk management strategies will include adherence to industry best-practice and adoption of the HS model. In addition, with 'high-risk' consignments there is also a need for exporters to prepare a consignment risk management plan.

4.2.4 The investigation report

4.2.4.1 The scope of the report

The investigation report should focus specifically on the three terms of reference, as follows:

TOR 1: Identification of cause(s) and contributing factors

The investigator(s) should clearly identify the cause(s) and contributing factors leading to the incident. Relevant information about the veterinary investigation of mortality rates during live animal export from Australia is included in **Appendix 2**. To maximise the effectiveness of any future investigations, it is recommended that voyage veterinarians and/or stockmen routinely collect the following information:

- The total number of animals loaded, by species, deck, class and port of loading
- The number of deaths each day, by date, species, deck, class and port of loading. If post-mortems are conducted, any results should also be linked to date, species, deck, class and port of loading.
- The environmental conditions each day, including wet bulb temperature at several representative points in the livestock area

TOR 2: Assessment of relevant risk management strategies

The investigator(s) should provide a critical assessment of the adequacy of the risk management strategies relevant to the consignment, noting that this will include adherence to the 'standards of baseline practice' and heat stress risk management, and may also involve a consignment risk management plan.

TOR 3: Development of recommendations, on the basis of 'lessons learned'

The investigator(s) should develop recommendations on the basis of lessons learned in relation to the earlier terms of reference. As stated, this section should specifically identify how the exporter, and as relevant the broader industry, should handle future consignments, in the light of lessons learned from this investigation.

> *SUMMARY: The investigation report should specifically address each of the three terms of reference.*

4.2.4.2 The timing of the report

The report should be completed, and submitted to LESCO, within one month of the incident.

> *RECOMMENDATION 18: It is recommended that the incident investigation report be submitted to LESCO within one month of the incident.*

4.2.5 The responsibilities and actions of individual exporters

It is the responsibility of individual exporters to fully-cooperate with any incident investigation as required by LESCO. This cooperation will include, but may not be limited to, the provision of any data or other information that could reasonably be related to the incident.

SUMMARY: It is the responsibility of individual exporters to fully-cooperate with any investigation as required by LESCO.

4.2.6 The responsibilities and actions of the Livestock Export Standards and Compliance Organisation

As with risk management, LESCO will play a central role in minor incident management. It is recommended that LESCO have the following responsibilities:

In general terms

- Overall management of a program of minor incident management, including all issues relating to cost, timeliness, quality and continuous improvement; and
- Ongoing responsibility to review the appropriateness and effectiveness of relevant systems to monitor defined health and welfare outcomes.

With respect to specific incidents

- Identification of minor incidents requiring investigation;
- Overall supervision of the investigation process, including ongoing linkages with the investigation team; and
- Critical review of the investigation findings. Findings from each report may impact on individual exporters (through compliance) and on the industry as a whole (through the industry risk management development program - see 3.4.5).

SUMMARY: The LESCO will play a central role in minor incident management. The LESCO will be responsible for ongoing management of a program of minor incident management, ongoing responsibility to review relevant monitoring systems, identification of incidents requiring investigation, overall management of each investigation and critical review of the report findings.

5 ACHIEVING COMPLIANCE

5.1 Introduction

The approach to achieving compliance is more than just checklists, manuals, auditing processes or on going training programs. At an industry level, a compliance framework is a comprehensive system that forms part of the overall approach to ensuring that the Live Export Accreditation Program achieves the desired outcomes required by the industry and its stakeholders including AQIS, the Government and the wider community.

The key elements of any industry compliance framework include:

Responsibility, Resourcing and Authority	A clearly identified industry body that has the responsibility, authority and appropriate resourcing to ensure that industry participants understand their compliance obligations.
Participation	A clear process for insuring members join a program that promotes compliance with appropriate standards, codes and/or regulations. Industry members must be able to demonstrate an acceptable level of understanding of the relevant standards and regulations.
Commitment	A clear statement developed by the industry that embraces the industry's commitment to compliance.
Continuous improvement	An industry approach to ensuring continuous improvement. In particular that procedures adopted by industry participants reflect best practice in terms of complying with the relevant standards/regulations. Such continuous improvement processes would include training programs, workshops and guidelines that assist participants with standard/regulation compliance
Incident reporting	An industry incident reporting system that is: Visible; Accessible; and Responsive.
Audit/Review	The establishment of an audit process that assesses industry participant's compliance with the relevant standards/regulations.
Sanction administration	A regime of penalties applying to industry participants, including the ultimate penalty of removal from the industry program, or other disciplinary measures such as: The downgrading of membership; or The provision of formal undertakings to the body responsible for compliance.

Reporting/publicity	A process by which the body responsible for compliance reports regularly, to relevant stakeholders, key performance indicators that demonstrates, in aggregate, the level of compliance being achieved by industry participants. It is envisaged that formal undertakings should be a matter of public record and open to public scrutiny.

Under the current Live Export Accreditation Program, compliance is achieved through two related mechanisms:

- LEAP Accreditation via LiveCorp; and
- Ongoing auditing to assess compliance with the revised outcome-based standards.

Based on the compliance framework outlined above, the following section highlights areas where the existing framework adopted by the Live Export Accreditation Program can be improved.

5.2 Accreditation

5.2.1 Pre-accreditation training

Under the current system of accreditation, exporters are required to demonstrate knowledge of the ALES and some experience regarding the export of live animals, but this demonstration might be via the services of a consultant. This is considered a significant flaw in the current accreditation arrangements.

As a consequence of these concerns and as part of the accreditation process, it is recommended that pre-accreditation training become mandatory, and accreditation would only be determined once the training on the appropriate method of export has been completed. Integral to this training, first-time exporters and key staff would be required to attend at least one comprehensive and well-structured course of relevant training, and demonstrate competence in each of the following topics:

- The purpose and principles of an outcome-based standard;
- The management of animal health and well being during live export;
- The need to report on mortality rates;
- The management of incidents;
- The purpose and principles of compliance, and the consequences of non-compliance;
- Legislative issues relating to live export; and
- Where to go for assistance.

It is possible that other topics may also be considered relevant to pre-accreditation training. Further, it is expected that these training courses would be developed to reflect the type of livestock exported and the method of exportation (i.e. sea or air), and that they would operate in conjunction with existing LiveCorp training programs, such as the training and accreditation of shipboard stockmen.

RECOMMENDATION 19: It is recommended that pre-accreditation training become a mandatory requirement for new entrants seeking first time accreditation. Before achieving accreditation, exporters and key staff would be expected to attend relevant training, and demonstrate competence in a range of topics, including outcome-based standards, risk management, incident management, compliance and legislative issues. The training will be specific to livestock-type and export-method.

Furthermore, it is recommended that the LESCO be responsible for the development, conduct and scheduling of relevant pre-accreditation training; and the monitoring of attendance. The fee structure for such training would be determined on a fee-for-service basis.

RECOMMENDATION 20: It is recommended that the LESCO be responsible for the relevant pre-accreditation training, including development, conduct, scheduling and quality assurance.

5.2.2 Accreditation and demonstrated ability

An application for accreditation does not currently distinguish exporters according to:

- The species of livestock (for example, sheep, cattle or goats); or
- The methods of export (for example, air or sea).

Under current arrangements there appears to be nothing to prevent an exporter who, for example, exports breeding cattle by air from commencing exporting sheep by sea. Knowledge and experience are reasonably applicable across species but not between different methods of transport.

Whilst the LEAP accreditation rules require exporters to implement a Quality Management Program, this in itself does not demonstrate that the exporter has the relevant knowledge or skills regarding animal welfare or is familiar with the specific risks associated with the export of livestock by air or sea.

As a consequence of these concerns and consistent with the recommendations with respect to pre-accreditation training, it is recommended that exporters be accredited on the basis of livestock-type and export-method.

RECOMMENDATION 21: Practicalities notwithstanding, it is recommended that exporters be accredited on the basis of livestock-type (for example: sheep, cattle and/or goats) and export-method (that is, air and/or sea).

5.2.3 Accreditation fees and industry access

Since 1 July 2003, the cost of accreditation has been determined on the basis of export-method. Conceptually, there may be a case for structuring fees for accreditation according to the level of associated risk[21]. There are two reasons for this:

- It would be consistent with the broad approach of an outcome standards approach, which is underpinned at many levels by the issue of risk; and
- It may help to limit new entrants to those enterprises that have given serious consideration to all dimensions of the industry – not just the immediate commercial prospects. While the industry should do nothing to limit the healthy competition and innovation that new entrants might bring, it should also want to signal to potential entrants that the sustainability of the industry relies on high technical and ethical standards.

Historical data, routinely collected by LiveCorp, could provide a useful indicator with respect to risk (with riskier ventures being associated with higher levels of adverse animal health and welfare outcomes). However, the practical difficulties of developing differential fees is readily acknowledged so a hard and fast recommendation is not proposed at this time.

> *RECOMMENDATION 22: It is recommended that a risk-based approach to determining accreditation fees be given consideration. Using this approach, riskier ventures (which are associated with higher levels of adverse animal health and welfare outcomes) might incur higher accreditation costs. Data collected by LiveCorp could be used to assess the level of risk. Actual implementation would depend on further analysis.*

The *Australian Meat and Live-stock Industry Act 1997* (the Act) does not necessarily make it mandatory for an exporter to be accredited by LiveCorp in order to be granted an export licence. Section 12 of the Act states the requirements for the granting of a licence as follows:

(1) The Secretary must not grant an export licence unless satisfied that:

(a) if the applicant is an individual, the applicant is:
(i) a person of integrity; and
(ii) competent to hold the licence; and
(iii) a person of sound financial standing; and

(b) if the applicant is a body corporate, the applicant is:
(i) a body corporate of integrity; and
(ii) competent to hold the licence; and
(iii) a body corporate of sound financial standing; and

(c) each person who participates or would participate, in the management or control of the applicant's meat or live-stock export business or proposed meat or live-stock export business is a person of integrity; and

(d) the applicant is, and is likely to continue to be, able to comply with the conditions to which the licence, if granted, would be subject; and

(e) the granting of the licence to the applicant would not, for any other reason, be contrary to the interests of the industry.

[21] Structuring fees to reflect inherent risk is not uncommon eg, the insurance surcharge placed on young drivers.

(2) The regulations may prescribe the matters to which the Secretary is to have regard for the purpose of satisfying himself or herself about the matters referred to in subsection (1).

It seems, therefore, that the Secretary is only required to have regard to the regulations[22] and might not be prevented from granting a license, should the exporter be unable to demonstrate that they are accredited by LiveCorp. Legal opinion, sought by LiveCorp, refutes this possibility as follows:

- The Secretary must take into account whether or not LiveCorp has granted accreditation to an exporter;
- There is no other mechanism for an exporter to establish competency;
- The Secretary may refuse an export licence even if LiveCorp grants the exporter accreditation; and
- LiveCorp must give procedural fairness to exporters in respect of LiveCorp's decisions regarding accreditation[23].

SUMMARY: The Secretary must take into account whether or not LiveCorp has granted accreditation to an exporter but he / she may refuse an export licence even if LiveCorp grants the exporter accreditation.

5.2.4 Cessation of accreditation and formal undertakings

5.2.4.1 The current penalty system

Under the current system, penalties available to LASC and LiveCorp include:

- downgrading in accreditation category; and
- complete withdrawal of accreditation.[24]

Such penalties are available, and would be considered where an exporter is unable to show cause as to why their accreditation should not be downgraded or withdrawn. Furthermore, the process for considering such a withdrawal or downgrading of accreditation provides for:

- An exporter to be provided with a show cause notice;
- the exporter to make written submissions;
- LASC to give due consideration to the submissions made; and
- to recommend, if necessary, withdrawal of the exporter's accreditation.[25]

In the past, action taken by LASC against exporters for non-compliance with the standards has been limited. Since 2000 it is understood that:

- only two exporters have had their accreditation withdrawn; and
- one exporter has had their export license revoked.

Although it is not currently possible to link failure to apply sanctions to the mortality problem, the above record (of limited activity) occurred during a period when the number of shipments reporting

[22] AMLI Regulations Reg 6(6)(a)
[23] Legal opinion from Ebsworth & Ebsworth lawyers obtained in writing on 29 July 2003.
[24] Rules for Accreditation – 10.0 Cessation of Accreditation
[25] Rules For Accreditation - 10.2.8

unacceptable mortality rates increased from 16 in 2000 to 18 in 2002.[26]. In addition, sheep mortalities have continued to increase – approximately 29,000 more sheep died during shipment in 2001-02 than in 1999-2000.[27].

A reason put to this review by LiveCorp regarding the limited action taken by LASC, has been the impact that withdrawal of accreditation would have on an exporter's ability to operate as an exporter of livestock. Whilst accreditation assists an exporter's application for an export license, failing to be accredited does not, of itself, prevent an exporter from having an export license granted by AQIS. Accordingly, given this background and recognising the importance of ensuring procedural fairness when assessing an exporter's accreditation status, it is recommended that the independent LESCO should not be constrained in its ability to withdraw or downgrade an exporter's accreditation.

SUMMARY: Under the current system, the penalties available to LiveCorp have included downgrading in accreditation category and complete withdrawal of accreditation. However, these penalties have rarely been enacted in recent times, despite sizeable increases in the relative and absolute numbers of incident events.

5.2.4.2 The introduction of additional powers – formal undertakings

The formal undertaking

As noted previously, the penalties available to the LESCO (notably the downgrading and/or withdrawal of accreditation) are somewhat limiting. Therefore, and in keeping with changes in other Australian sectors[28], it is recommended that the LESCO be able to accept formal undertakings from an exporter.

Formal undertakings are consistent with the overall aim of serving the public interest in respect of animal welfare, and also in keeping the trade in place for those suppliers who operate within achievable risk limits. Furthermore, they offer an additional penalty pathway for the LESCO. For example, where an exporter (either through a notifiable incident or through a LEAP audit) has been identified as failing to comply with the standards, (s)he can be asked to provide a written, formal undertaking which outlines the action that (s)he intends to take in order to remedy the identified failure to comply with the standards.

The formal undertaking regime would be considered appropriate where:

- LESCO becomes aware of facts or circumstances suggesting that an exporter has failed to comply with the standards, or the exporter has engaged in a practice that LESCO considers is inappropriate from an animal welfare perspective;
- The failure to comply with the standards does not justify LESCO taking the extreme steps of varying, suspending or cancelling an exporter's LEAP accreditation; and

[26] Acting Federal Agriculture Minister Senator Ian Macdonald - Media Release: "Action taken on live export trade" (20 January 2003, AFFA 03/007M)
[27] Senate -Rural And Regional Affairs and Transport Legislation Committee - Monday, 10 February 2003
[28] Similar undertaking regimes have been established and regulated by such enforcement agencies as the Australian Competition and Consumer Commission (ACCC), the Australian Securities and Investment Commission (ASIC), the Australian Prudential Regulatory Authority (APRA) and the Civil Aviation Safety Authority.

- It is considered important to deter a recurrence or continuation of the failure to comply with the standards.

Formal undertakings may also be appropriate where the LESCO becomes aware that an exporter does not have, or may not have, the appropriate levels of skill or training. In such skill deficiency situations, the LESCO would seek undertakings to ensure that the organisation does not engage in certain activities – for example, to only export certain types/breeds of animals or only export to certain countries – until the exporter can demonstrate specified levels of skill or training have been achieved.

> *RECOMMENDATION 24: It is recommended that LESCO be given additional powers, in the form of formal undertakings. The formal undertaking regime would be appropriate in minor situations of non-compliance where deterrence is needed, but where more draconian action is not justified.*

In each situation, it is envisaged that the formal undertaking would be subject to negotiation between LESCO and the exporter as to which elements are appropriate and what undertakings LESCO is prepared to accept. Suggested elements of the formal undertaking would include:

Background	A brief description of the exporter and relevant conduct;
The undertaking	What the exporter undertakes to do. Among other things, this would include any necessary reporting by the exporter to LESCO or additional auditing in order to demonstrate successful completion of the undertaking; and
Acknowledgment	Acknowledgment by the exporter that the undertaking may receive limited forms of publicity.

Most undertakings would also contain the following ingredients:

A. Commitment

The foundation of an undertaking made by an exporter must be a positive commitment to cease the particular conduct and not recommence it.

B. Corrective action

In the resolution of any matter, LESCO would be concerned to find ways to ensure that the harm / damage caused by the failure to comply with the standards does not reoccur.

For example, an incident involving livestock that suffered persistent inappetence-salmonellosis-inanition (the PSI syndrome) may require the exporter to provide an undertaking that procedures are documented to minimise the risk of this syndrome, and staff are provided with appropriate training prior to the establishment of the next export shipment. The issue of stock selection would be critical to the effective management of this syndrome.

C. Overall compliance

It would be envisaged that in many settlements, the LESCO would require the exporter to undertake a program to improve its overall compliance with the Standards. Typically such a program would involve a combination of such elements as:

- Clear demonstration that the Board and senior management are committed to, and involvement with, the entire ALES program;
- Assignment of responsibility for the ALES compliance to a named senior manager;
- Development and dissemination throughout the exporter's business of a clear compliance policy;
    - Identification of compliance issues and operating procedures for compliance;
- Development of a compliance training program;
- Delivery of the program, at a specified frequency, to groups within the organisation who would identify areas of the business at risk of failing to comply with the standards; and
- Establishment of permanent procedural checking / monitoring mechanisms.

At a specified time after the settlement of an undertaking, the exporter may also be required to report to LESCO on the steps taken to implement the corrective action and to improve compliance with the standards. Such reporting may require an independent audit review.

SUMMARY: A formal undertaking will include core elements (including background, undertaking and acknowledgements), but would also be expected to include evidence of commitment, corrective action and overall compliance.

Breach of an undertaking

Following acceptance of an undertaking, as referred to above, LESCO would require that its implementation and effectiveness be monitored, which will generally be the responsibility of the exporter. The terms of the undertakings should provide for the monitoring of such compliance. For example, these terms could require:

- Provision of information upon the request of LESCO; and
- Information and reasons for non-compliance within the terms of an undertaking.

Given that it would normally be straightforward to prove that an undertaking has been breached, most exporters are likely to consider that it is in their interests to make every effort to comply.

SUMMARY: Following acceptance of an undertaking, the LESCO would generally require that its implementation and effectiveness will be monitored.

5.3 Auditing

5.3.1 Introduction

The achievement of a sustainable business environment requires an effective audit and control function to be embedded throughout the industry. The objective of this audit function is to express an opinion as to whether exporters conduct their business in accordance with the identified regulatory framework, namely the LEAP Handbook, and to recommend actions to realign exporters with the regulatory framework where non-compliance is identified.

The auditor is obliged to adopt an attitude of professional scepticism throughout the audit recognising that circumstances exist that may cause non-compliance with the standards. In recognising this, the audit function must develop a program that provides reasonable assurance that non-compliance will be detected.

Due to the inherent limitations of any audit process, there will remain an unavoidable risk that some instances of non-compliance may not be detected even though the audit has been conducted properly. An audit does not guarantee that all non-compliance will be detected due to such factors as the use of judgement, the use of sample testing, the inherent limitations of internal controls and the fact that the evidence available to the audit is persuasive rather than conclusive in nature. For these reasons, the audit function is able to provide only reasonable assurances that non-compliance will be detected.

Best practice audit frameworks typically contain five components:

1. Audit Program — Information surrounding the audit process itself (typically contained within the compliance framework i.e. LEAP Handbook) includes:

    - A background of the audit process (which party performs audits, process that must be followed, penalties for non-compliance etc)
    - Detail of what is to be audited (risk management procedures, accreditation, LEAP standards etc)
    - How audits are to be performed (based on risk profile, periodic and/or randomly selected, systems or substantive testing etc)

2. Audit Testing — Testing is conducted as detailed by the Audit Program, typically including both testing of systems and substantive testing (depending on the risk profile of the exporter).

3. Action Plan — Findings of audit testing are developed into an action plan for the exporter to implement in order to remedy instances of non-compliance.

    Common components of the action plan include:

    - A detailed listing of non-compliance issues with recommended actions required to remedy these issues;
    - Accountabilities assigned to each recommended action;
    - Timeframes within which each action must be implemented and reported to the regulatory body; and

- KPI's to measure the effectiveness of actions required.

4. Monitoring/Reporting	A framework for tracking and reporting actions taken to remedy instances of non-compliance.
5. Continuous Learning	A system of developing improvements to the audit process sourced from:

- Recurring issues identified from audits;
- Emerging issues revealed from incident reports;
- Intelligence detailed in Stockman's reports; and
- Training/education on areas of recurring non-compliance.

5.3.2 Concerns with the current auditing program

During this review, detailed discussions were held with a range of parties, including the current auditing body. On the basis of these discussions, the following points are noteworthy:

- Auditing is currently undertaken specifically to assess compliance with the LEAP standards. But as stated previously, these standards are prescriptive and cannot be relied upon to consistently manage all physical and biological risks.
- Auditing is currently reliant on exporter notification of intent to export. Based on experience, however, organising audit visits currently requires repeated contact by the auditors thereby removing the element of surprise.
- Although random audits are possible under the current LEAP rules[29], such audits are rarely if ever achieved.
- Despite the LEAP handbook stating that follow-up audits may be conducted, they do not prescribe them as necessary to all audits that identify significant non-compliance issues.

In light of the above-mentioned concerns, and also as a consequence of the proposed changes to LEAP, significant changes to the scope and emphasis of auditing are recommended. However, it must be stressed that it is essential for each of the recommendations detailed in this section to be reviewed by a cross section of accredited exporters to ensure they are achievable in practice and can be complied with from an audit perspective.

5.3.3 Proposed changes to auditing

5.3.3.1 Audit Program

Timing and intensity of auditing

It is recommended that the timing and intensity of auditing be determined using a risk-based approach. Particular attention should be given to those exporters with high LESCO assessment scores and with individual high-risk consignments.

It would be anticipated that these people would be audited regularly (preferably 3-4 times each year), whereas auditing of other exporters would be undertaken infrequently (for example, once a year).

[29] Note rule 5.1.4

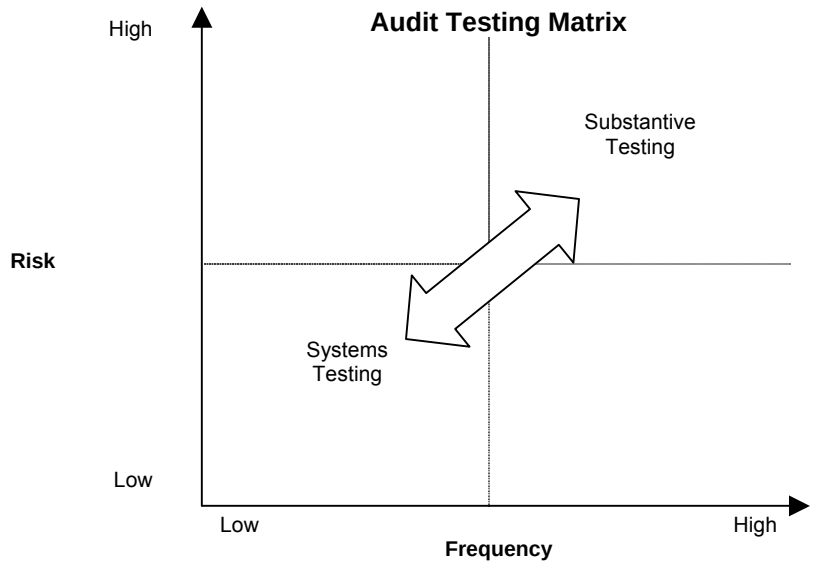
RECOMMENDATION 25: It is recommended that the timing and intensity of audit testing be determined using a risk-based approach utilising designated LESCO Assessment Scores. This would entail exporters with high-risk LESCO assessment scores being audited more frequently than low risk exporters.

Character of audit procedures

This risk-based approach to auditing can also be applied to determine the character or audit procedures required to be conducted to obtain reasonable assurances that exporters are compliant with relevant standards. Best practice in auditing techniques require a mix of both systems and substantive based testing to obtain sufficient information to assess the operations of the industry.

Systems testing	Tests performed to obtain audit evidence about the suitability of design and effective operation of the internal control structure. This would involve the review of documented quality plans of exporters to ensure that they reflect the requirements of the LEAP standards.
Substantive testing	Tests performed to obtain audit evidence to detect material errors and mis-statements in individual transactions This would involve detailed investigation into individual shipments to ensure documented quality plans are in fact adhered to.

The mix of systems and substantive testing utilised is dependent on the level of risk associated with the exporter being audited. As an exporter moves into the higher risk quadrant shown in the diagram below, greater levels of substantive testing are required to obtain sufficient assurance that the exporter is compliant.



Despite a regime of systems and substantive testing currently existing, the effectiveness of substantive testing has been diminished due to a risk-based approach not being utilised and the inability to conduct proper random audits to date (refer later sections). As such, a more substantive and risk-based approach is recommended to remedy the situation.

Ability to conduct unannounced audits

Although there is provision for unannounced audits within the current LEAP rules (LEAP 5.1.4), this provision is rarely enacted due to problems associated with notification-to-export and the limited value of random audits based upon prescriptive standards.

With respect to an outcome-based standard, however, there are occasions when auditing is more effective if unannounced. For example, auditing will be most effective if exporters are visited whilst livestock are being assembled for export and physical export activities are being performed. Similarly, there may be the need for an announced audit to a series of properties-of-origin. As a consequence, it is recommended that unannounced audits be conducted as required. Unannounced audits will be most effective if LESCO receives universal and advanced notice of intention to export.

RECOMMENDATION 26: It is recommended that unannounced audits be conducted as required. Unannounced audits will be most effective if LESCO receives universal and advanced notice of intention to export.

It is recommended that the character of the audit be determined using a risk-based approach that utilises designated LESCO Assessment Scores. This would entail audits of high-risk exporters containing increased substantive testing.

Notifying LiveCorp of intention to export

Currently, ALES only requires exporters to advise LiveCorp of an intended export where the enterprise is exporting cattle or buffalo on a voyage of 10 or more days.[30] In respect of all export shipments of sheep, goats and in the case of cattle/buffalo on voyages of less than 10 days, neither LiveCorp nor the auditors have any knowledge of when enterprises intend to carry out such exports.

Irrespective of the livestock exported and the duration of the voyage, exporters should be required to notify LESCO of their intention to export prior to the event.

We would recommend that the rules relating to continuing audits be amended to reflect the following:

> *5.1.5 In order to conduct random audits at times that are relevant to the exporting of livestock, all accredited enterprises will notify LESCO of their intention to export at least seven days prior to the event for each proposed consignment.*

Consideration will need to be given (possibly including legal advice) as to whether such an amendment is a 'reasonable' requirement of accreditation and practically achievable. However, as detailed above, such a requirement for cattle/buffalo on a voyage of more than 10 days is already a requirement.

RECOMMENDATION 27: It is recommended that changes be made to ALES requiring exporters, irrespective of shipments involved, to notify LESCO of intention to export at least seven days prior to the event.

The auditing organisation

Auditing is currently undertaken for LiveCorp by an independent body. This body (currently AUS-MEAT) is expected – and able – to provide a range of specialist auditing skills.

As LiveCorp is not structured itself to conduct the recommended auditing program, it is recommended that auditing continue to be undertaken for LiveCorp by a suitable independent body. The selection of a suitable body should be based on the following (with possible additional) criteria:

- Independence;
- Relevant skills, including technical auditing skills relating to agreed animal health and welfare outcomes and risk management;
- Ability to provide the necessary coverage; and
- Cost-effectiveness.

RECOMMENDATION 28: It is recommended that auditing continue to be undertaken for LESCO by an independent body. Criteria for selection of this body should include knowledge of the industry, independence, proven and relevant auditing skills, coverage and cost-effectiveness.

5.3.3.2 Audit Testing

As mentioned above, it is recommended that audit testing be based on the risks associated with individual exporters. In order to facilitate this process, audit testing has been divided into two components, primary and secondary audits.

- *The primary audit:* It is recommended that auditing be conducted with the purpose of assessing basic compliance with agreed animal health and welfare outcomes and competency in the planning and implementation of risk management (relating to animal health and welfare) throughout the export process. The primary audit would be conducted on all exporters.
- *The secondary audit:* It is also recommended that further auditing be undertaken to verify compliance if aspects of the primary audit are found to be uncertain or unsatisfactory. A secondary audit would involve more detailed and substantive testing than the primary audit.

RECOMMENDATION 29: It is recommended that auditing change both in scope and emphasis, as follows:

- *A primary audit (of all exporters) would be undertaken to assess compliance with agreed animal health and welfare outcomes and competency in the planning and implementation of risk management (relating to animal health and welfare) throughout the export process.*

[30] Note ALES 6.8.1 (a)

- *A secondary audit (to be enacted if aspects of the primary audit were considered uncertain or unsatisfactory) would involve more substantive testing to obtain assurances regarding the exporters' compliance with the export standards.*

The primary audit – agreed health and welfare outcomes

The purpose of this component of the audit is two-fold:

- To test the validity of reported information relating to agreed animal health and welfare outcomes; and
- To compare actual results with agreed thresholds throughout the export process.

As discussed previously, it is recommended that mortality be considered the primary indicator of animal health and welfare during live export. Other outcomes may be added in due course.

The export process includes all stages from the time the animals leave the property-of-origin through to their discharge at the port(s) of disembarkation. Accordingly, there is a need to measure mortality at each stage of export, including:

- Farm-of-origin to feedlot;
- Feedlot;
- Feedlot to export vessel; and
- Export vessel.

It is recommended that the audit include, but may not be limited to, a detailed evaluation of all relevant documentation with the aim to reconcile animal numbers and reported mortality rates at each stage of export. The key data points are presented in Figure 11 and Table 3. Using the points from Table 3, mortality rates during each phase of export could be reconciled as follows:

- Farm-of-origin to feedlot, using data from 7 and 9. There is considerable variability in the staged movement of livestock from farm-of-origin to feedlot. At its simplest, stock are moved in a single stage between these points. In this situation, the mandatory use of electronic national vendor declaration (eNVD) forms would ensure that animal numbers could be reconciled at the time of auditing. However, in many situations there is a staged movement of stock from property-of-origin to feedlot, to enable numbers to accumulate at each stage. In such situations, it will not be possible to reconcile animal numbers on the basis of eNVD forms alone, and accountability will only be possible if eNVD forms were to be linked to individual animal identification.
- Feedlot, using data from 9 and 10
- Feedlot to export vessel, using data from 10 to 12
- Export vessel, using data from 12, 14 and 15. There is currently no authority to govern shipments once they cross international boundaries. As such, the audit process has no authority to cover the final phases of the export process, and co-operation must be sought from exporters to gain reliable reporting en-route and at disembarkation. It is recommended that LESCO investigate practical methods to address this concern.

Table 3 presents the data required to reconcile livestock numbers throughout the export process. At some later stage, there will be a need to restructure this information to create performance criteria and a performance checklist for use in an auditing regime. Relevant performance criteria could include:

The enterprise has implemented quality systems that generate a reconciled account of mortality rates during the export process. The export process extends from the property of origin to disembarkation.

The relevant performance checklist would then include:

Can the exporter demonstrate to the satisfaction of the auditor:

- The starting number of livestock purchased/accumulated?
- The number of livestock deaths during transport to the feedlot?
- The number of livestock unloaded at the feedlot?
- The number of unloaded livestock that were rejected?
- The number of deaths during feedlotting?
- etc

RECOMMENDATION 30: It is recommended that LESCO investigate practical methods to improve the rigour of auditing during the final phase of export (parts E and F in Table 3). Useful methods are likely to include the exit 'health certificate', real time recording and reporting of mortalities by ship stockmen and assigning stockmen numbers in proportion to livestock numbers in particular consignments. For example, it is recommended that electronic national vendor declaration forms become mandatory for all animals at the point of entry to the live export trade. Further, it is recommended that consideration be given to the mandatory use of individual animal identification during live export, which would enable animal numbers to be reconciled – for the purposes of auditing –in all situations, regardless of the number of stages between property-of-origin and feedlot.

In line with improvements to technology, it is recommended that the audit be underpinned, as appropriate, by recent advances, including general improvements in data exchange and mining, as well as specific improvements to animal and/or flock traceability (including electronic vendor declaration). This aspect of the audit may be unannounced (random), and may involve both horizontal *(that is, involving audits across consignments)* and vertical *(involving audits at various stages of a single consignment)* components.

SUMMARY: As part of the primary audit, and specific to agreed animal health and welfare outcomes, it is recommended that the audit:

- *assess the validity of reported information, and*
- *compare actual results with agreed thresholds throughout the export process.*

It is recommended that the audit include, but may not be limited to, a detailed evaluation of all relevant documentation with the aim to reconcile animal numbers and reported mortalities at each stage of export. Further, the audit may be unannounced (random), and may involve horizontal (across consignments) and vertical (at various stages of a single consignment) components

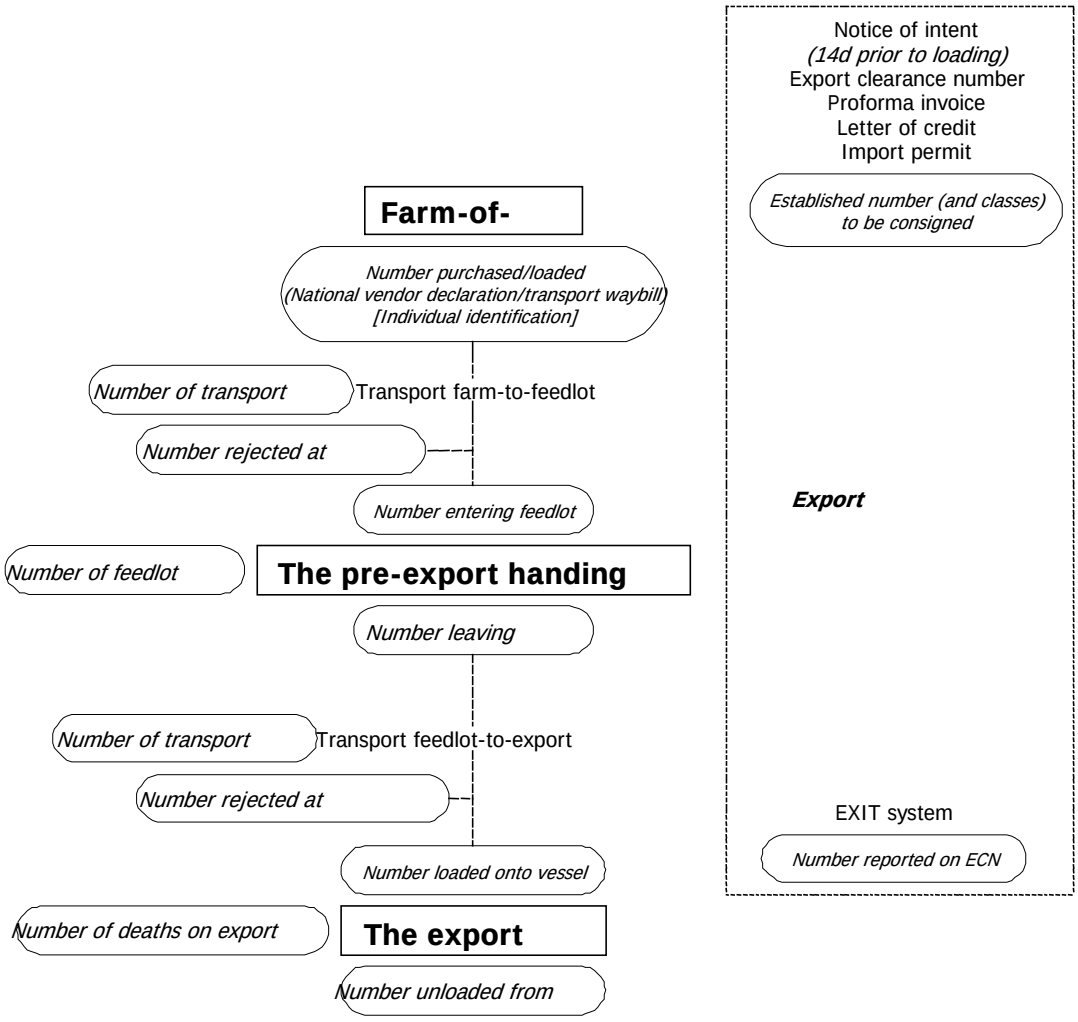


Figure 11: The live animal export process, including data required for mortality reconciliation.

Table 3: The live animal export process, including data required for mortality reconciliation

Livestock export process *An example*		**Primary audit** **Mortality reconciliation**
A.	**Administration prior to export**	
	1. Notice of intent to export (NOI) lodged	
	2. Export clearance number (ECN) assigned	
	3. Proforma invoice issued	Estimate of number / classes to be consigned.
	4. Letter of credit (LC) / import permit received	Confirmation of number / classes to be exported.
	5. LC confirmed.	
	6. Import permit verified *against AQIS information*	
B.	**Livestock: farm-of-origin to feedlot**	
	7. Livestock purchased to fit order	Number purchased / loaded (Vendor declaration form, transport waybill)
	8. Livestock prepared for trade	
	9. Livestock transported to pre-export facility	Number entering feedlot, number rejected at unloading Number of transport deaths
C.	**Livestock: feedlot**	
	10. Livestock held at pre-export handling facility	Number of feedlot deaths, number leaving feedlot
D.	**Livestock: feedlot to export vessel**	
	11. Livestock transported to point of export	Number of deaths during transport
	12. Livestock loaded onto export vessel	Number loaded onto vessel, number rejected at wharf/ airport
E.	**Administration at export**	
	13. EXIT system notified	Number reported on ECN
	14. Health certificate	
F.	**Livestock: export vessel to importing country(ies)**	
	15. Livestock shipped to importing country(ies)	Number of deaths on export vessel
	16. Livestock unloaded at importing country(ies)	Number unloaded from vessel

The primary audit - risk management

As part of the primary audit, it is also recommended that auditing be conducted to assess competency in the planning and implementation of risk management (as it relates to animal health and welfare) throughout the export process. In other words, the audit function in LEAP should be expanded to assess whether appropriate risk management frameworks exist and have been applied by exporters (and other bodies relevant to specified consignments) to effectively identify, analyse, evaluate, treat, manage and communicate key risks associated with animal health and welfare.

This aspect of the audit should be conducted after considering each of the criteria:

An integrated risk management approach — An integrated approach to risk management, by the exporter, requires that risk management is an integral part of the live export process. The exporter has policies, strategies, and a comprehensive system to demonstrate a risk management culture.

Commitment and leadership — The achievement of an integrated risk management approach and culture requires strong leadership and a commitment at the highest level/s within the exporter organisation. There is an active and committed focus by all senior executives to “champion” the practice of risk management in order to minimise mortality rates that might be associated with the export of livestock.

A positive and proactive focus — The exporter maintains a proactive role in the identification, analysis and treatment of potential risks relating to the export of livestock.

A process-driven approach — The exporter has a framework capable of implementing risk management processes. The exporter is able to demonstrate that he / she has a clearly defined and documented risk management process, which is integrated into all live export related processes.

Planning for continuous — There is a continuous application of risk management practice with a clearly defined risk planning process. Continuous control,

improvement	performance monitoring, review and improvement of planning and practices are clearly part of the exporter's culture.
Review and documentation	There are developed and applied mechanisms to ensure ongoing review of risks. The exporter has a well-developed review, reporting and documentation system in place. The exporter monitors and documents all levels within the risk management process.
Active communication	Active communication and consultation occurs with internal and external stakeholders (e.g. the LESCO) at each stage of the risk management process and concerning the process as a whole. A communication plan has been developed at the earliest stage in the risk management process, with the plan addressing issues relating to the risks themselves and the process to manage it. There is a staff position responsible for communicating risk management policies and the risk management program.
Resourcing	The exporter has identified and committed adequate resources to support the full implementation of risk management practices and processes on a continuing basis. The business has assigned accountability for the management of risk and has adequate risk management resources to protect it against these risks.
Training and education	The exporter is committed to the training and the education of staff in risk management with an ongoing and funded training and education program.

RECOMMENDATION 31: As part of the primary audit, it is recommended that the auditor assess whether appropriate risk management frameworks have been applied by exporters (and other bodies relevant to specified consignments) to effectively identify, analyse, evaluate, treat, manage and communicate key risks associated with animal health and welfare. Key criteria relevant to this assessment would include evidence of an integrated risk management approach, commitment and leadership, a positive and proactive focus, a process-driven approach, planning for continuous improvement, review and documentation, active communication, resourcing, and training and education.

The LEAP auditors would have the ongoing role of reviewing these risk management plans against plans developed by the independent LESCO. As discussed previously, feedback from the auditor would contribute to the industry risk management development plan.

RECOMMENDATION 32: It is recommended that the auditors review the risk management plans against model plans that have been developed by LESCO. Further, it is recommended that feedback from this process be used by LESCO as part of the industry risk management development program.

The secondary audit

The secondary audit (to be enacted if aspects of the primary audit are considered uncertain or unsatisfactory) would involve a more detailed audit of compliance with increased levels of substantive testing. As previously explained, using the Audit Testing Matrix, where the primary audit has raised suspicions over the compliance of the exporter, more detailed testing is required to obtain the level of assurance required to assess whether the exporter is in fact compliant.

The secondary audit would therefore involve:

- Audit of a larger sample of an exporter's shipments; and
- Conducting random audits of physical livestock shipments.

in order to obtain the required level of assurance as to whether the exporter is in fact compliance.

RECOMMENDATION 33: It is recommended that a secondary audit be enacted where the primary audit results are unsatisfactory or inconclusive. The secondary audit would audit an increased sample of shipments in addition to increased instances of random physical audits of shipments in order to obtain sufficient evidence to assess compliance or non-compliance.

5.3.3.3 Action Plans

The requirement for action plans to be developed where instances of significant non-compliance are identified currently exists within the LEAP Rules for Accreditation.

Corrective Action Requests (CAR's) are issued and contain:

- Details of significant non-compliance issues;
- Details of actions required to remedy the situation;
- Accountabilities for implementing these actions; and
- Timelines indicating when these actions must be implemented.

The LEAP Rules for Accreditation also contain provisions for follow-up audits to be conducted to review CAR's and ensure that actions have been taken by the designated timeframe. The wording of the standard, however, only states that follow-up audits "may " occur. Despite the fact that follow-up audits may be conducted in all instances of identified non-compliance, this implies that there is a possibility that CAR's will not be pursued, thereby increasing the risk of exporters not implementing recommended actions to remedy their non-compliance.

RECOMMENDATION 34: It is recommended that Section 5.3 of the LEAP Accreditation Rules be amended to state that follow-up audits will be conducted for all initial audits that result in the issue of a Corrective Action Request (CAR) to ensure that required actions have been implemented.

5.3.3.4 Monitoring / Reporting

Linkages with LESCO will be central to the proposed auditing process. As a result of the primary audit, important information will be gained with respect to compliance with animal health and welfare outcomes (as well as outcome reporting), and also with respect to risk management plans. Similarly, the secondary audit will provide information relevant to compliance. Formal reporting structures are needed to ensure that this information is reported to the LESCO compliance sub-group. This information is critical to the role of LESCO in managing the industry risk management development program (see section 4.4.5.2).

SUMMARY: Linkages between auditing and LESCO will be central to the recommended auditing process, and formal reporting structures are needed. Information from the primary and secondary audits will assist LESCO to fulfil its responsibility to effectively manage the industry risk management development program.

5.3.3.5 Continual Improvement

The continual improvement of the audit process is critical in ensuring the audit process does not lose focus of significant changes and emerging issues that arise in the industry.

The industry has a vast amount of intelligence that is available including:

- Results of audits;
- Incident reports; and
- Stockman's reports.

Currently, these sources of information are not being utilised to their potential but they could be used to create an audit process that is pro-active and preventative in nature.

It is recommended that these sources of information are periodically reviewed by the Compliance Committee and incorporated into the LEAP Handbook and the audit process. Where necessary these changes may require an education/training program for making exporters aware of new requirements and thereby minimise instances of non-compliance.

RECOMMENDATION 35: It is recommended that intelligence detailed above be reviewed by the Compliance Committee on a quarterly basis and incorporated in the LEAP Handbook and subsequently the audit process.

6 REVIEW OF THE LEAP HANDBOOK

6.1 LEAP Rules of Accreditation

This section makes recommendations on how the LEAP rules of accreditation might be changed to achieve better animal welfare performance throughout the live export industry. Each recommendation is referenced against the LEAP Handbook, March 2001. *Unless a specific change is intended, the current Handbook wording is considered satisfactory and no recommendation is offered. Also note that the table numbers referred to in this chapter follow those used in the LEAP Handbook.*

Introduction

The purpose of LEAP is to:

(a) adopt and adhere to practices that will enhance the good reputation of the Australian livestock export industry;

(b) meet customer and community expectations regarding the handling and presentation of livestock;

(c) ensure participants achieve industry best Standards and operating procedures;

(d) ensure participants are fully aware of the Commonwealth Government's export legislation and its need to satisfy importing country protocols;

(e) meet industry, government and community expectations relating to the treatment and wellbeing of animals throughout the livestock export process; and

(f) cooperate with government to ensure a regulatory environment in which the industry can function sustainably.

1.0 Definitions and Interpretations

1.1 Definitions

LASC will be replaced by ICC (Industry Consultative Committee) and LESCO (Livestock Export Standards and Compliance Organisation). ICC means an industry advisory committee constituted as shown in the Handbook. LESCO means an industry group responsible for independent administration of the rules of accreditation and application of the standards as explained elsewhere in this review.

<This substitution should be made throughout the document>

<Throughout the document, LESCO should replace LiveCorp where the latter refers to administration of the LEAP rules and standards. If LiveCorp remains it will be equivalent to ALEC (the Australian Livestock Exporters Council)>

1.2 Presumptions of interpretation

1.2.1 <*replace existing*> For the purpose of these Rules, all powers to be exercised by LESCO are exercised by its Chief Executive Officer (or delegate) unless these Rules otherwise provide.

2.0 Obligation of enterprises

2.2 Quality System

< *addition*> The manager of each enterprise must, personally, have a technical knowledge of the enterprise's Quality System. Prior to new accreditation, the manager may be tested (via written exam or interview) for knowledge of the enterprise's own Quality System. Beyond this, the Quality System must include

i) details of how the enterprise's management system interface with objectives and outcomes;

ii) risk management plans for specific consignments (as detailed elsewhere in this review);

iii) specific reference to how mortality rates will be kept below threshold rates;

iv) a clear undertaking to report mortality rates for critical intervals of the export process;

v) specific reference to how other measures of animal health and welfare will be met; and

vi) overt cooperation with LESCO including provision of advance notice of exports events.

3.0 Fees

3.2 Setting fees

< *addition following first sentence*> In addition, LESCO may use a risk-based approach when determining the fee structure for accreditation.

4.0 Application

*4.*1 Application to LiveCorp

<*addition*> 4.1.3 Accreditation of enterprises will be restricted by livestock-type (that is, sheep, cattle, buffalo and/or goats) and export-method (sea and/or air).

<*addition*> 4.4 Pre-accreditation training

Satisfactory completion of pre-accreditation training, specific to livestock-type and export-method, will be a prerequisite to accreditation. Prior to accreditation, key Enterprise personnel (as specified by the LESCO) must attend relevant training, and demonstrate

competence in a range of topics (as specified by the LESCO) that are relevant to live export. The training will be specific to livestock-type and export-method.

5.0 Continuing audits

It is recommended that primary and secondary audits be conducted, as specified in section 6.3.2. Primary auditing, to be undertaken on all Enterprises, will be undertaken to assess compliance with agreed animal health and welfare outcomes and competency in the planning and implementation of risk management (relating to animal health and welfare) throughout the export process. Secondary auditing (to be enacted if aspects of the primary audit were considered uncertain or unsatisfactory) would assess compliance with all other aspects of LEAP, including adherence to the 'standards of baseline practice'. The primary audit will entail the auditor examining data about animal numbers and mortality rates relative to the systems in place for managing mortality risk. The emphasis will shift from routine to unannounced audits. Exporters who do not report mortality rates in a timely and accurate manner will be audited as if they had reported unacceptable mortality rates.

<*replacing existing*> 5.1.5 A primary audit will be conducted with all Enterprises, and will assess compliance with agreed animal health and welfare outcomes and competency in the planning and implementation of risk management (relating to animal health and welfare) will be conducted with all Enterprises. A secondary audit will be enacted if aspects of the primary audit are considered uncertain or unsatisfactory, and will assess compliance with all other aspects of LEAP, including adherence to the 'standards of baseline practice'.

<*replacing existing* > 5.1.6 In order to conduct unannounced audits and other functions at times that are relevant to the exporting of livestock all accredited enterprises will notify LESCO for each proposed consignment of their intention to export at least seven days prior to the event.

<*addition*> 5.1.7 Audit Assessment score will be assigned by an Auditor at primary and secondary audit as shown in Tables 1a and 1b, respectively.

<*replace existing*> Table 1a – LESCO Assessment Scores (primary audit)

Assessment Score	**Comment**
Complies	1. Valid mortality rates are being reported in a timely manner to LESCO and AQIS, and fall within acceptable limits as specified by ALES; 2. Appropriate risk management frameworks have been applied to effectively identify, analyse, evaluate, treat, manage and communicate key risks associated with animal health and welfare and these data can be verified.
Does not comply	1. Reported mortality rates exceed acceptable thresholds; and/or 2. Mortality rates have not been reported in a timely manner to LESCO and AQIS as required by ALES; and/or 3. Reported mortality information is not valid; and/or 4. Appropriate risk management frameworks have not been applied to effectively identify, analyse, evaluate, treat, manage and communicate

key risks associated with animal health and welfare.

<*addition* > Table 1b – LESCO Assessment Scores (secondary audit)

Assessment Score	**Comment**
Complies	The quality system is effective and: a. Data is being used to monitor product quality variation and to promote error prevention procedures; and b. Defect levels are known and improvement is measured and monitored; and c. The Quality system is effective and production personnel are well informed as to their quality responsibilities and correct any non-conforming product without the intervention of Accredited Persons.
Not fully verified	The Quality System is documented and approved and systems are in place to support documented procedures. Procedural effectiveness has not been verified at audit.
Does not comply	The Quality System needs improvement as: a. Errors have not been detected, recorded or corrected; and b. Those errors are of a nature that may prejudice the reputation of LESCO, the integrity of LEAP or the interests of the Australian livestock export industry in relation to the sale, distribution or export of Australian livestock.
Not applicable	No secondary audit was undertaken, or the assessment section is not applicable to the scope of the Enterprise quality management system.

<*addition*> 5.1.8 When auditing, the Auditor will evaluate non-conformance according to a non-conformance scale as shown in Table 2 following:

6.0 Enterprise categories

The categories should remain defined as shown in Table 3, with the exception of category C where the Enterprise would be suspended from trading pending an assessment of the evidence by the Industry Consultative Committee.

<*replace existing*> 6.2 Changes to the Accreditation categories of Enterprises will be made by LESCO after receiving a recommendation from the Industry Consultative Committee, the latter based on evidence collected as part of the industry risk management development program.

<*addition to existing*> 6.2.4 Any enterprise placed in Category C will be suspended from exporting until its status has been assessed by ICC and applied by LESCO. If LESCO puts

an Enterprise into Category C it will immediately notify ICC and AQIS and seek (from ICC) a recommendation on the Enterprise's future accreditation status.

<*addition*> 6.3 In the event of non-conformance, the LESCO may consider the use of a formal undertaking regime as an alternative to either the downgrading or withdrawal of accreditation. As a minimum, a formal undertaking between the LESCO and the Enterprise will include core elements of background, undertaking and acknowledgements, and is also expected to include evidence of commitment, corrective action, overall compliance and publicity.

7.0 Audit frequency

<*replace existing*> 7.1 Audit frequency will be determined using a risk-based approach. In assessing risk, account will be taken of the LESCO Accreditation category and the association between the Enterprise and high risk consignments. Table 4 provides a guide to audit frequency, although this is subject to change at the discretion of LESCO.

<*replace existing*> Table 4 Guide to Audit Frequency, by LESCO Accreditation Category and association with high risk consignments

LESCO Accreditation Category	**Audit frequency (number/year)**	
	Associated with high risk consignments	**Not associated with high risk consignments**
ISO[a]	2	1
A+	2	1
A	4	2
A-[b]	Every shipment	4
B[c]	Every shipment	Every shipment
C[c]	Every shipment	Every shipment
P[d]	Every shipment	Every shipment

a Enterprises are required to have four (4) audits in the first two (2) year period of accreditation

b The Enterprise will be returned to the A category when those activities previously assessed as non-conformances are, following a audit, assessed as complying or not applicable and no other activities are assessed as non-conformances (as detailed in Tables 1a and 1b). Subject to Paragraph 6.2.6, the Enterprise will be categorised as B category when those activities previously assessed as non-conformances are reassessed as non-conformances.

c The Enterprise will be returned to the A category when, in the opinion of LESCO, the Enterprise is meeting and will continue to meet all of the requirements of LESCO.

d The LESCO may require next and/or subsequent shipments to be audited until the Enterprise meets the requirements of category A at the discretion of LESCO. Where an area is

assessed at audit as not complying with the requirements of LESCO, the Enterprise Accreditation category will be changed to A-.

9.0 Provisional accreditation

9.1 Grant

<*addition* > 9.1.2 A proposed Enterprise may be granted provisional accreditation for a maximum period of six months with a maximum of one month extension

9.2 Obligations

<*replace existing*> 9.2.1 The enterprise must comply with all the rules of accreditation, including a demonstrative knowledge of livestock exporting and practical risk management.

<*replace existing*> 9.2.2 The enterprise must notify LESCO of intended shipments not less than 14 days prior to departure.

ANNEXURE 1: QUALITY SYSTEM REQUIREMENTS

3.1 Enterprises that are exporters

(d) The Enterprise must establish and maintain procedures for the following activities

<*addition*> Accurate record of animal numbers

The Enterprise must establish and maintain detailed and accurate documentation to the satisfaction of LESCO the number of animals at critical points during the export process, and the number of deaths between each critical point.

3.1 Enterprises that are assembly depots

(d) The Enterprise must establish and maintain procedures for the following activities

<*addition*> Accurate record of animal numbers

The Enterprise must establish and maintain detailed and accurate documentation to the satisfaction of the LESCO the number of animals at critical points during the export process, and the number of deaths between each critical point.

SUMMARY: A number of changes to the LEAP Rules of Accreditation are recommended, in keeping with the move to an outcome-based standard. Additions and/or changes are suggested to the Introduction, 1.0 Definitions and Interpretations, 2.0 Obligations of Enterprises, 3.0 Fees, 4.0 Application, 5.0 Continuing audits, 6.0 Enterprise categories, 7.0 Audit frequency, 9.0 Provisional accreditation, and Annexure 1.

6.2 Australian Livestock Export Standards

INTRODUCTION

The Australian Livestock Export Standards (ALES) are baseline standards that document best practice procedures for the exporting of cattle, buffalo, sheep and goats from Australia. The standards are designed to ensure the welfare of all livestock intended for export by providing a benchmark to assist exporters in appropriate selection, preparation, management and handling of all livestock throughout the entire export process from the point of origin of the animals to discharge at their final destination. The standards have been devised through a combination of practical industry experience and scientific knowledge gained as a result of previous and ongoing R&D into the livestock export trade. From time to time, the standards will be subject to changes to reflect the best possible welfare practices and procedures for exporting livestock from Australia.

6.2.1 General comments

The ALES documentation currently forms the basis of the industry's prescriptive standard. With the shift to an outcome-based standard, however, there will need to be substantial changes to ALES, particularly with respect to:

- An overview of an outcome-based approach *(discussed further in Chapters 2 and 3)*
- Relevant animal health and welfare outcomes *(Chapters 2 and 3)*
- Managing animal health and welfare risks *(Chapter 3)*
- Managing incidents *(Chapter 4)*
- Achieving compliance, including accreditation and auditing *(Chapter 5)*

Relevant changes to ALES have yet to be finalised, but will be based on detailed information in other parts of the report.

SUMMARY: Some sections of ALES will need to be redrafted, as a consequence of the recommended change to an outcome-based approach. Revision, which is yet to be completed, will address key reforms, including;

- *An overview of an outcome-based approach*
- *Relevant animal health and welfare outcomes*
- *Managing animal health and welfare risks*
- *Reporting and managing incidents*
- *Achieving compliance, including accreditation and auditing*

6.2.2 Standards of baseline practice

With the shift to an outcome-based approach, it is recommended that the management of animal health and welfare risks be undertaken using the following key strategies:

A. For all consignments

- *An ongoing requirement to meet 'standards of baseline practice'.* These standards would be similar to the existing ALES, but with periodic revision to reflect new knowledge; and
- *Mandatory application of methods to manage heat stress during live export.*

B. For 'high-risk' consignments

- As an additional requirement, the development of a consignment risk management plan.

These strategies are considered in detail in Chapter 3.

As a consequence of these changes, it is recommended that the current ALES be retained, but considered as 'standards of baseline practice' within the recommended risk management strategy. Given this context, a critical evaluation of ALES has been conducted, using the following criteria:

- An evaluation of ALES in its new role as 'standards for baseline practice' within an outcome-based approach to risk management;
- An evaluation of ALES against recent advances in scientific knowledge, particularly from the LiveCorp program of research and development; and
- An evaluation of ALES against current industry knowledge and experience.

The first two evaluations are complete, with the third to be finished pending feedback from each of the state Chapters.

SUMMARY: The ALES documentation currently forms the basis of risk management within industry. As a result of the recommended changes, risk management will rely on several strategies, including adoption of the 'standards of baseline practice', which will be based on the current ALES document. As part of the conversion from ALES to the 'standards of baseline practice', the current documentation is being critically evaluated, given its new role, against recent advances in scientific knowledge and against current industry knowledge and experience. Much of this work is complete, although the final evaluation is pending feedback from each of the state Chapters.

As indicated in the overall objectives, ALES represents a combination of practical industry experience and scientific knowledge (LiveCorp, 2001). Although there is some unease within industry with specific aspects of ALES (for example, stocking rates for some classes of animals whilst at-sea), there is currently insufficient scientific evidence in most areas to support substantial change from the *status quo.* Nonetheless, several amendments to ALES have been recommended, as a result of recent advances in heat stress risk management. Further amendments are suggested as a consequence of recommended changes to risk management during live export. These amendments include:

ALES Section	Proposed amendment
4.	Provisions relating to the Notice of Intention to Export will be broadened such that LiveCorp / LESCO and its auditors are also informed about the intention to export. Exporters can choose to copy the NOI to LESCO or provide a separate document

	with the same basic information.
5.	Provisions relating to notifiable incidents will be broadened to include mortality rates that exceed pre-agreed levels during each of the agreed stages of export.
6.8.6	The minimum pen area per head for cattle exported by sea is as stated in Tables 1 to 3, with further adjustment for each consignment based on heat stress risk management modelling.
6.8.20	Defined incident management procedures will be instigated when unacceptable health and welfare outcomes occur during defined stages of export.
7.9.5	The minimum pen area (or space) per head for sheep and goats exported by sea is as stated in Table 5, with further adjustment for each consignment based on heat stress risk management modelling.
7.9.16	Defined incident management procedures will be instigated when unacceptable health and welfare outcomes occur during defined stages of export.

In line with current procedure, it is recommended that the standards of baseline practice be kept under review, incorporating changes or additions as knowledge increases.

SUMMARY: As part of the development of 'standards of baseline practice', a number of amendments to current documentation are recommended. These amendments relate to the Notice of Intention to Export, notification of incidents, pen area and heat stress risk management, and incident management.

6.3 Feedback from State Chapters

These comments were made by Peter Stinson (Industry Standards Manager, LiveCorp) following the meetings held around Australia to gauge initial reactions to proposals and the current thoughts from the export community on ALES.

"The opportunity was taken to review aspects of the Review in the context of possible changes to the LEAP Handbook should aspects of this review be implemented. Exporters were also given the opportunity to express their views on the current ALES and possible changes that may have resulted from changing market and operational conditions.

The feedback given below is recorded as it was given on a State by State basis with the exception of South Australia who replied on an individual exporter basis and their feedback is incorporated in the WA State feedback.

Analysis

1. The Rules for Accreditation
   There were two main areas of feedback, the audit practices and the need for documented Quality Systems. Audits are always a contentious issue especially in the Northern Territory where cost was seen as a major problem. But the major issue with audits was a perceived lack of knowledge of the industry matters by the exporter. The need for documented quality systems was linked to ensuring that duplication between regulators was minimised as well as ensuring the Quality Systems are relevant to the export process.

   Comments received on the Rules for Accreditation indicated a favourable view of the proposed changes to the Rules in areas such as risk management and changes to the auditing regimes. However, they also demonstrate a need for better communication by the regulatory bodies with Exporters on the functioning of QA systems

2. ALES
   Comments in this section were highly specific and tended to reflect the constraints and problems in the various industry sectors represented around Australia.
   Briefly comments covered:
   a. Maximum Weights for Cattle,
   b. Pregnancy testing,
   c. Horned cattle,
   d. Lack of registered veterinary preparations for Goats and the inclusion of a Veterinary approved clause,
   e. The use of "HotStuff" (ie, HS software) to replace stocking density tables where appropriate,
   f. The need to ensure effort is not duplicated especially in the area of assembly depots and AQIS' involvement,
   g. The need for "headroom" specs in airfreight,
   h. The veterinary kit needs to be re-examined.

Where appropriate, these comments can be incorporation into the review. This notwithstanding, feedback from the meetings with Exporters indicated a high degree of acceptance and ownership of the existing Standards. Considering that the format of the meeting was to go through the ALES on a line by line basis, the level of comment and degree of comfort with the existing standards would indicate a high degree of satisfaction with the current content of ALES."

Blue Section – Rules of Accreditation

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 2 Page 11 onwards *"Obligations of Enterprises"*	There is no proposals to change this. Enterprises will still be expected to have a documented auditable Quality Management System covering the topics listed here and in Annexure 1	No problems	No problems	No problems	No problems
Section 3 Page 14 on *"Fees*"	The Industry Standards section of LiveCorp is under the new ALEC/LiveCorp merger will be separated as a stand alone body. As such it will need its own revenue supply. It is anticipated that this will come from an increase in the Accreditation fee to $3,300 and $1,100 for sea and airfreight resp. This will be supplemented by revenue from the LiveCorp/MLA Joint Program and therefore thee accreditation fees will be credited against LiveCorp membership fees	Accreditation fees should be much higher than $3,000. Try $50,000.	No problems	Arrangements when an exporter switched between air and sea? An additional fee could be invoiced and the exporter audited on their first shipment.	Some discussion but general agreement
Section 4 Page 14 on "Application"	This section is not anticipated to change	No problems	No problems	No problems	No problems
Section 5 Page 15 *"Continuing Audits"*	It is anticipated that section 5.1 will change especially in regard to who is audited and how often. It is the aim of the ALES review to base audit frequency on the level of risk of the consignments undertaken.	LiveCorp should provide a dedicated NT auditor to try and control cost of audits. Possibly a retired exporter.	Auditing should be contestable ie, approved auditing bodies should be sought and exporters given the	No problems with providing a copy of the NOI nor with no feedback on audit frequency. Risk audits okay but	Possible increase in audit frequency not seen as a problem. However, the standard of the audit was questioned and

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
	Also it is proposed to introduce unannounced audits Sections 5.2 to 5.5 will probably not change		choice of auditors.	need to look at proof for certain requirements. Caution needed when audit structure changed.	the need for better knowledge of the industry was also discussed but lack of knowledge seen as a bigger problem
Section 6 Page 19 *"Enterprise Categories"*	This may change but just how has not been proposed as yet	A+ a problem with offices operating a dual exporting business.	No problems	For accreditation renewal, suggest that a letter go out with the accreditation category.	Enterprise categories was expanded but accepted with little change
Section 7 Page 22 *"Audit Frequency"*	See note on Section 5	No problems	No problems	Will comment when recommendation completed.	No problems
Section 8 Page 24 *"ISO"*	No change anticipated	No problems	No problems	No problem.	No problems
Section 9 Page 26 *"Provisional Accreditation"*	This section will change. Provisional accreditation will only be granted for 6 months with an extension possible if applied for to go another 6 months. No further extension to be allowed. There will be penalties for not informing LiveCorp of shipments while on Provisional accreditation and the numbers of Provisional plants will be closely monitored with the idea of moving plants to full accreditation. This will mean that exporters will not be able to gain accreditation and then not export	All accreditation should be on a contractual basis. This will ensure that LiveCorp receives NOIs.	No problems	Agree with action taken. Is there a way to rid the industry of undesirables? (This is the prerogative of government).	Fully agree with the six month time period. Supportive of a formal course.
Section 10-14 Page 27	These sections will change mainly due to the formation of the Industry Standards	No problems	No problems	No problems	Standards Group should include only

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
	Group, a representative committee which will replace the current LASC and will have the transferred to it the current power of the LiveCorp CEO.				two shareholders. The position of the Standards Officer was strongly supported.
Annexure 1	It is anticipated that there will be no major changes to this but there may be minor changes to take into account Risk Management and AQIS Action on Export Premises	The requirements for a documented quality system seems irrelevant to the NT industry eg, auditor insisting on a full management meeting when there is only two people on the staff.	No problems	Okay – should all be in our manuals. Look at pre-export facility requirements due to AQIS audits etc.	Some discussion of the Registration of Export premises and the tie up with LEAP accreditation.

Green Section - ALES

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 1 Page 51 *"Related Legislation"*	AQIS is restructuring the Legislation and streamlining the Export Control Act and the AMLI Act and Regulations. This may alter this section. Also it is anticipated that this section will be expanded to provide greater assistance to the Exporter will more detail of the relevant Legislation both State Federal and Codes of Practice	The NT Act should be examined for possible linkages to LEAP	Must have an AQIS agreement and commitment. Cannot allow other regulators to short circuit the shipment with their own rulings.	No problems	No problems
Section 2 Page 52 *"Definitions"*	There may be minor changes here	There is confusion re the definition of 'competent stockman'. It should be 'accredited stockman'	No problems	No problems	No problems
Section 3 Page 53 *"Export Protocols"*	No changes expected	No problems	No problems	There should be some guidance in the standards to decide which has priority – the importing country protocol or ALES. In aspects of animal welfare, it should be ALES.	No problems
Section 4 Page 53 *"NOI"*	The ALES Review as a preliminary recommendation has mandated as part of LEAP, a copy of the NOI to LiveCorp. If this is taken up action will be taken to remove any commercially sensitive information	Agree	Agree	No problems	No problems

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 5 Page 54 *"Notifiable Incidents"*	No changes expected	No problems	No problems	No time to discuss	No problems
Section 6.1 Page 55 *"Cattle Selection"*	Open to comment from industry	The maximum wt limit of 700kg should be reviewed or taken out. Risk Management should be allowed to operated here. Preg testing and certification is a problem. There should be a vendor declaration only and this carried into govt documentation. Verification at audit raises problems with AUS-MEAT.	Horn length too prescriptive. Could possibly be re-worded to be 'horn length to be within the span of the ears' or similar. Cow with calf should be allowed to go under appropriate conditions. Pregnant cattle should be allowed as slaughter cattle as well as breeder.	- Pregnant cattle should follow the existing guidelines. There should not be opportunity to export pregnant slaughter cattle. - 6.1.8(b) 'exclude exports by air' as risk factor minimal.	Should be able to export 'cow and calf' even if offspring are less than 150kg with appropriate management.
Section 6.2 Page 56 *"Preparation"*	Open to comment from industry	No problems	Treatment with prostaglandin in the best practice box be lengthened from 60 to 90 days.	First clause in Best Practice box irrelevant.	No problems

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 6.3 Page 57 *"Veterinary chemicals"*	6.3.2 and 6.3.3 are not clear cut and can cause problems especially with Goats. Feedback would be appreciated	Many non-registered preparation esp of goats need to have added off-label veterinary approval. 6.3.3 should be deleted as exporters have no control re the end use of the animal. 6.3.5 is tedious and of limited use when you have a line of cattle of different wts with differing dosages.	The word breeder should be removed from 6.3.3. Non registered drugs commonly administered to goats should have a veterinary approval requirement.	- The term under veterinary instruction should be added as an alternative - Should thre be reference in this section to 3rd party vets?	Some treatments in common use but not registered. Should be able to use with veterinary authority.
Section 6.4& 6.5 Page 58 *"Assembly Depots"*	Trying to have these incorporated into Registration of Export premises	No problems	No problems		No problems
Section 6.6 Page 60 *"Land Transport"*	No changes expected	6.4.1 curfewing should come out of the best practice box.	The curfews should be reviewed in light of veterinary advice keeping in mind the flooring component of the trucks used		All curfew requirements should be looked at with the aim of reducing or scrapping them.

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 6.7 & 6.8 Page 61 *"Export by Sea"*	Open to comment from industry. In the short term no major changes to stocking density tables are envisaged, however as "HS" develops in 1-2 years, tables may be condensed	6.7 should be better enforced 6.8.1 "stockperson" should be used 6.8.6(c) should be deleted as it is rarely done and if it needs to be done then the exporter already has problems. Stocking density formulas to be included HS should be expanded to China and Mexico 6.8.14 needs to better reflect what is going on rather than a minimum which is too low 6.8.16 is covered by 6.8.1	Assumed that HS will replace heat issues in LEAP. If this is NOT the case the definitions of Northern summer needs to be redrafted. There should be feed standards for the industry.		- Clause 6.8.7 and 6.8.8 which are part of the Cattle Orders should be replaced with requirements from Hot Stuff. - HS should be extended to Mexico, Korea, Japan and China - Equations for stocking densities should appear in Standards - Feed requirements for cattle should be more detailed - References to SE Asia should include China
Section 6.9 Page 70 *"Export by Air"*	No changes expected	No problems	No problems		No problems
Section 6.10 Page 72 *"Humane Destruction"*	No changes expected	No problems	No problems		No problems

Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 7.1 Page 74 *"Sheep Selection"*	Open to comment from industry	Not considered	7.1.6(a) the word 'cold' should be added.		No problems
Section 7.2 Page 75 *"Feral Goats"*	Changes are expected in this area after consideration of the R&D Goat Risk Management report. Open to comment from industry	Not considered	Comment to be sourced via ALEC		Await the release of the R&D report
Section 7.3 Page 76 *"Preparation"*	Open to comment from industry	Not considered	No problem		No problems
Section 7.4 Page 76 *"Veterinary Chemicals"*	7.4.2 and 7.4.3 are not clear cut and can cause problems especially with Goats. Feedback would be appreciated	Not considered	See comment on 6.3		No problems
Section 7.5 & 7.6 Page 77 *"Feedlots"*	Trying to have these incorporated into Registration of Export premises	Not considered	The requirement of the consignment plans should match the LEAP requirements esp with the Registration of Assembly depot.		No problems
Section 7.7 Page 80 *"Land Transport"*	When the new Code of Practice for sheep transportation is introduced it will be incorporated	Not considered	See comments 6.6		No problems

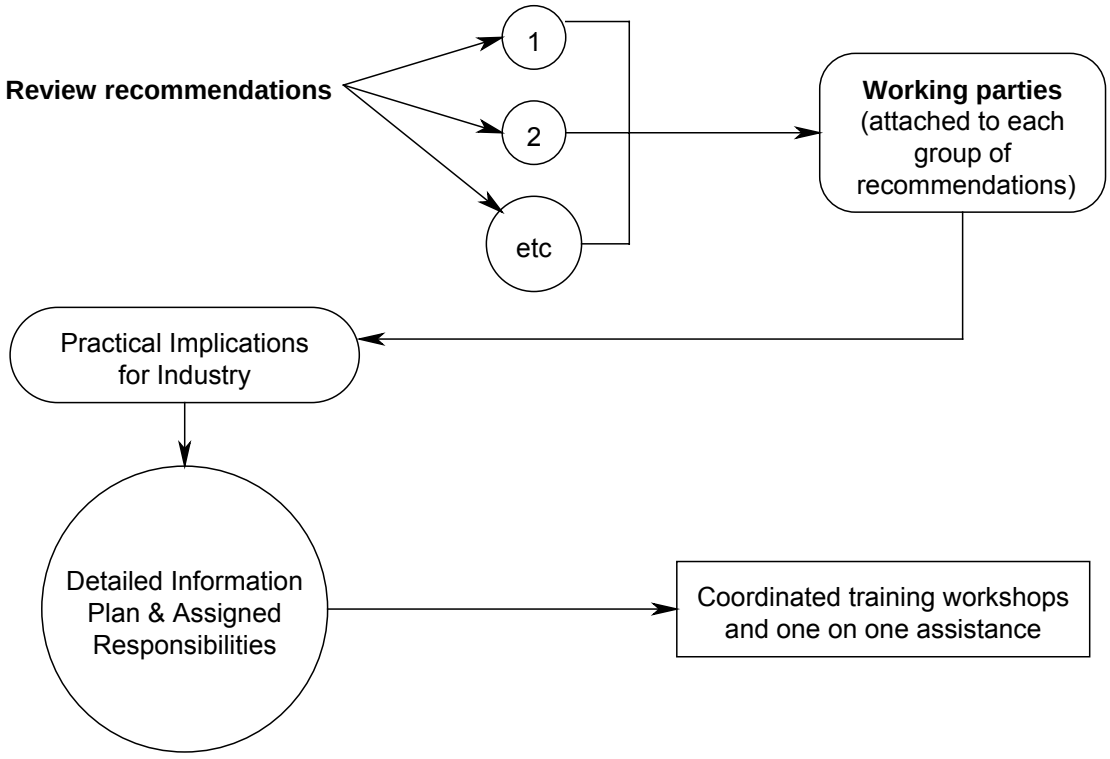
Section of the Standards	Draft Proposals	NT	WA	Vic	Qld
Section 7.8 & 7.9 Page 81 *"Export by Sea"*	Open to comment from industry. In the short term no major changes to stocking density tables are envisaged, however as "HS" develops in 1-2 years, tables may be condensed	Not considered	7.8.1 should be best practice. Sheep are culled at the wharf even if the reason lies in problems of transport to the wharf. 7.9.10 this needs to be revamped to provide either an accurate standard or leave out.		No problems
Section 7.10 Page 85 "Export by Air"	Open to comment from industry	Not considered	Need specs for headroom. IATA standards to be duplicated.		No problems
Section 7.11 Page 88 "Humane Destruction"	No changes expected	Not considered	No problem		No problems
Appendices	Open to comment from industry	The captive bolt gun must be the responsibility of the ship owner to supply. Syringe size need not be specified. Nose plies not needed.	The vet kit is too prescriptive and needs to be re done.		Vet Kit: Need to remove 18" needles. Electrolytes to be removed.

7 COMMUNICATION AND IMPLEMENTATION

7.1 Communication of proposed changes

It was the intent of this review to usher in a new approach to achieving compliance with ALES and concomitantly bring about acceptable animal welfare outcomes. As such, communication of the recommendations and underlying rationale to livestock exporters and other stakeholders is considered essential. Whilst the report is intended to be circulated in full to Meat and Livestock Australia, LiveCorp and ALEC and State Chapters, the practical implications should also be communicated in summary form to all groups with a keen interest in the industry. The summary documents would focus on the establishment of LESCO, risk management, auditing, incident management and changes to the LEAP Handbook.

If the recommendations of the review are accepted as the best way forward, the first step on the road to implementation will be a communications strategy, as shown in Figure 12. Over recent years the industry has conducted national workshops for the purpose of reviewing R&D projects and other issues of special significance. Through such forums, the current review was brought to the attention of industry members several times during its preparation. This background should help to gain early



and comprehensive commitment to the reforms advocated by the review.

Figure 12: Staged Communication Strategy

Table 4 provides a compilation of the key recommendations delivered by the review that can be used to create targets for the implementation strategy. Each recommendation in Table 4 is referenced against the complete set provided in the Executive Summary. Clearly the implementation strategy should be appropriately resourced to assist with communication and training throughout the industry.

Table 4: Implementation of key recommendations

Chpt.	Key recommendations	Responsible entity
2 (R4)	That accreditation of exporters and application of ALES be administered by a new organisation that is demonstratively independent but knowledgeable of the industry (see below).	LESCO
2 (R1)	That outcome-based standards be adopted by the live export industry and form the basis for risk and incident management and compliance.	Details in Review. To be ratified by LESCO
3 (R6)	That risk management systems be applied at all levels of the industry with the baseline standards made common to every shipment and each consignment defined as 'high risk' assisted by case-specific, risk management plans.	Details in Review. To be ratified by LESCO
2 (R2)	That mortality rates are used as the primary animal health and welfare outcome but other health and welfare measures be added as knowledge improves.	LiveCorp, ALEC and key industry stakeholders
2 (R12)	That a standards organisation be created with responsibility for certifying to AQIS the competence of exporters. A Livestock Export Standards and Compliance Organisation (LESCO) including a standards and compliance committee would operate under a legal umbrella. LESCO will provide leadership for risk management throughout the live export industry and manage the industry's risk management program.	LiveCorp and ALEC with ratification by AFFA
3 & 5 (R11)	That the current standards be retained as 'standards of baseline practice' and become mandatory for all consignments as part of a new approach to risk management during live export. All consignments to the Red Sea and Persian Gulf must actively manage for heat stress risk (using available software) and all 'high risk' consignments must develop a consignment risk management plan.	LESCO, LiveCorp
3 (R10)	That consignments risk management plans follow a two part proforma as follows: Part A – to identify, analyse and evaluate animal health and welfare risks; and Part B – to identify and assess risk treatment options to develop a detailed plan to manage the most important risks.	LESCO
4 (R15)	That minor incidents be investigated to determine the cause of the incident, the adequacy of risk management and how future consignments might be managed to avoid the same mistakes.	Details in Review. To be ratified by Standards Groups Ltd
4 (R17)	That the incident investigation team involve one or more people selected for skills, attributes and experience and they report to LESCO within one month of the incident occurring.	LESCO and Compliance Group
4 (R16)	That accredited veterinarians and stockman assist future investigates by collecting data on the number of animals loaded by port, species, class and deck; the number of deaths by date, deck, species, class and port of loading; the environmental conditions each day at representative locations in the livestock area.	LESCO and Compliance Group
6 (R20)	That pre-accreditation training become mandatory for first time exporters seeking accreditation. New exporters and key staff should demonstrate competence in risk management, compliance and legislative issues and importer country requirements and issues.	Exporters, AQIS

6 (R28)	That the style of auditing change from assessment of exporter compliance (based on standard question/answer sessions) to an open systems audit where the exporter's ability to achieve specified outcome standards. In practice, a primary audit would determine exporter competency in planning and implementation of risk management and it would be performed by industry-wise people. A secondary audit would assess compliance with all other aspects of LEAP including adherence to the standards of baseline practice.	LESCO and Compliance Group
6 (R27)	That auditing continue to be undertaken by an independent body selected on the basis of industry knowledge, independence, proven and relevant auditing skills and cost effectiveness.	LESCO and Compliance Group
6 (R26)	That ALES be changed to require exporters to notify LESCO of intention to export at least seven days prior to the event.	LESCO and Auditors
6 (R29)	That electronic national vendor declaration forms become mandatory for all animals at the point of entry to the live export trade. Further it is recommended that consideration be given to the mandatory use of individual animal identification during live export, which would enable animal numbers to be reconciled in all situation.	LESCO
6 (R29)	That Standards Group Ltd investigate practical methods to improve the rigour of auditing during the final phase of export – once the export vessel crosses international boundaries.	Standards Organisation
6 (R31)	That the auditor review the risk management plans of exporters against model plans developed by LESCO and provide feedback as appropriate to LESCO for use in the ongoing risk management development program.	Compliance Committee

To effectively implement the above action points, the standards and compliance groups will need to develop a systematic and methodical plan. The major phases in such a plan and the questions that should be addressed by LESCO when setting out the tasks for each phase are as follows:

Preplanning

To achieve commitment to reform the following positions need to be affirmed through the processes outlined in Figure 6.

- The industry fully understands the need and rationale for change;
- The industry is capable of, and ready for, a successful change process;
- The barriers within the industry that may impede the full implementation of the above action points have been identified;
- There a clear understanding and acceptance of why the industry cannot continue in its present state.

Planning

Similarly, the planning process will need to confirm that:

- A structured plan has been developed to manage the potential risks associated with achieving the successful implementation of the above action points;
- The required tasks, responsibilities, and timeframes have been clarified to ensure successful implementation;
- All the variables necessary to gain commitment from those in the industry affected by the recommendations outlined in this report are understood, co-ordinated, and controlled;
- The goals and milestones to be met during the implementation of the above action points have been set.

Next, the following critical roles should be defined:

- *Sponsors* (persons who can legitimise the action plan and relevant changes eg the Federal Government and AQIS);
- *Change agents* (persons who direct the implementation of actions and outcomes);
- *Targets* (persons who are impacted by the action points eg the exporters);
- *Advocates* (persons who strongly support the change but are not in a sponsorship position).

To achieve widespread commitment, individual exporters must believe in the reforms and feel as if they have been part of the process. Therefore, have all the industry's stakeholders been involved in the development of the implementation strategy?

Implementation

In practice, the creation of LESCO and its subsequent performance will determine the implementation outcomes. In the meantime, it is possible to identify the issues that LESCO is likely to confront:

- What resources must be devoted by the LESCO to ensure the action points detailed above are fully implemented within an acceptable timeframe;
- Are those who are part of the team responsible for implementing the action points ready to meet resistance (which is a natural reaction to change) from industry participants;
- Has the LESCO developed mechanisms (eg workshops, industry briefings or online help) to encourage airing of concerns and problems;
- Has the LESCO considered meaningful reward and reinforcement mechanisms in order to encourage adoption of the changes by the industry?

Project Tracking

- Has LESCO considered what measurement systems need to be established to monitor the implementation of the action points;
- What data will LESCO rely on to measure implementation progress and identify barriers to implementation of the action points?

Project Evaluation

- Have evaluation techniques been designed by LESCO to analyse the extent to which the implementation activities have achieved their desired results (i.e. acceptable mortality rates)?

SUMMARY: LESCO will need to develop a systematic and methodical implementation plan to ensure that the above issues and questions are addressed.

7.2 Direction of LESCO

LESCO would be responsible for maintenance of LEAP, monitoring codes of practice and acting as the independent live export consultative body on behalf of industry and government. It would operate through a holding company (LASCO Board Ltd) with membership from MLA and the merged ALEC / LiveCorp together with an independent chair. The LASCO Board would be responsible for approving budgets, contractual agreements between the government and service providers, determining referrals from the Compliance Committee and approving audited accounts.

To ensure that the model as outlined is effective, the operation and resourcing of LESCO should be as outlined below.

LESCO should comprise nine voting members drawn from the following bodies:

- Two exporters selected by merged ALEC / LiveCorp;
- Two producers (one cattle from CCA and one sheep / goat producer from SCA – president or nominee in both cases);
- One AQIS representative;
- One animal welfare representative nominated by RSPCA;
- One State government representative;
- One liveship representative;
- An independent Chairman appointed by the LESCO board of directors.

The industry standards manager of merged ALEC / LiveCorp would attend meetings but have no voting rights. A service provider would be contracted to provide administrative support. AUS-MEAT is likely to fulfil this role along with providing the independent audit function. Some of the functions presently performed by LiveCorp would logically belong with LESCO eg, collection of statistics pertaining to shipments and administration of the standards.

LESCO should have the authority and resources to undertake continuous improvement of the accreditation requirements and standards applying to live export based on the following:

- The findings of commissioned R&D;
- The feedback stemming from incident investigations. Such investigations are likely to uncover information regarding both the behaviour of exporters and technical aspects of new risk management strategies. The knowledge captured and accumulated via LESCO should allow continuous enhancement of the standards for the betterment of the live export industry.

Feedback from the auditor and incident investigations

Apart from reporting on the competency and compliance of enterprises with the industry's outcome standard, the auditor should routinely provide feedback to LESCO on the performance of enterprises and make recommendations that will assist continuous improvement across all sectors of the trade. This should include the identification of existing tools and techniques that operate effectively, and can be utilised across the industry.

Experience gained and passed on by operatives within the industry

Exporters and service providers should be encouraged by LESCO to provide feedback for the purpose of improving the standards. Thus systems are needed to capture the experiences and knowledge of exporters regarding what practices will and will not work

SUMMARY: LESCO should have the power and resources to undertake continuous improvement of the accreditation requirements and standards applying to live export.

Vision

LESCO should be recognised as an independent animal welfare standards management organisation that has the confidence of all stakeholders.

Mission

LESCO's mission should be to promote compliance with the Australian Livestock Export Standards and to enhance this nation's position as a trusted exporter of livestock.

Goals

The goals of LESCO will be to:

- Protect and promote livestock well being during the exportation process;
- Promote consultation and communication, provide a consistent "whole of industry" approach to Australia's live export policy and provide for accurate and comprehensive industry information;
- Provide a balanced and integrated approach to compliance with the Australian Live Export Standards; operate within a risk management framework; ensure that the Standards are based on sound science and risk assessment and which minimise costs of compliance;
- Monitor and review the ongoing effectiveness of the Australian Live Export Standards and the Live Export Accreditation Program. In particular, oversee the on-going development of the LEAP Rules for Accreditation and maintaining the process of developing the Livestock Export Standards;
- Provide an oversight to the application of sanctions authorised under the Rules of Accreditation including dispute procedures. Overseeing investigations of non-compliance matters;
- Recognise the critical linkages with Federal and State government agencies responsible for animal welfare and strive for a government/industry approach to animal welfare and livestock exportation. Of particular importance to the LESCO will be linkages with AQIS, AFFA and State Government based entities;
- Maintain and enhance the technical capacity to operate as a centre of excellence in risk management.

Standards Compliance

The Livestock Export Standards need to be based on sound science and risk assessment, with due regard being taken of uncertainties in scientific information. Wherever possible, standards should be focussed on achieving verifiable 'outcomes' (eg acceptable mortality rates). Standards should also reflect the philosophy of 'minimal regulatory intervention' and the fact that the primary responsibility for exporting livestock, in line with acceptable animal welfare standards, lies with industry.

Features of the standards program administered by the LESCO will be:

- Quality Assurance Programs;
- Risk based management plans;
- Monitoring and review;
- Cost-effectiveness and efficiency;

- Clarity of roles and responsibility.

> *SUMMARY: LESCO will ensure industry adherence to the standards through such tools as Quality Assurance Programs, risk based management plans and compliance / risk management audits.*

Compliance / risk management audits

The Compliance Group will need to ensure that it promotes compliance with the standards in a consistent manner. Application of compliance and risk management audits will ensure that exporters are operating consistently in meeting the prescribed standards.

An effective compliance / risk management audit and enforcement program requires:

- Active monitoring and surveillance for compliance with standards;
- Rapid and systematic response to incidents;
- Expeditious investigation and action in the case of non-compliance with the Standards;
- An accreditation suspension/withdrawal process that is targeted at exporters who flagrantly and willfully fail to comply with the standards.

Auditing will be undertaken to assess the competency and compliance of the supplier in relation to the industry's outcome standard. In addition, it is proposed that the auditor routinely provide generic feedback and recommendations. This information would assist the Compliance Group to promote continuous improvement across all sectors of the trade.

It is envisaged that similar to the current audit process for which LiveCorp has responsibility, the Compliance Group would contract out the auditing task to an independent third party. For the purposes of undertaking detailed systems analysis, however, the auditor's staff should have to demonstrate skills relevant to the livestock export industry. Moreover, staff would have to be available on a national basis to conduct an effective auditing program.

The auditors will need to be given specific directions in terms of assessing exporter's compliance with the ALES and the development of Consignment Risk Management Plans. The focus in terms of the ALES will be identification of non-compliance with the Standard. In respect of auditing Consignment Risk Management Plans, the focus would be on assessing whether an appropriate risk management framework has been applied by the exporters and that the plans operate to effectively identify, analyse, treat, manage and communicate key risks associated with the export of livestock and animal welfare.

> *SUMMARY: The Compliance Group will need to ensure that it promotes compliance with the standards in a consistent manner. Compliance and risk management audits will be a key function for ensuring that exporters are operating consistently in meeting the rules and standards.*

Information consultation and communication

Gaining and maintaining the confidence of all stakeholders will ultimately determine the success of the Standards Group and its operatives. Open communication and consultation with stakeholders about livestock export issues and risk management decisions will assist in gaining that confidence. Current duplication in terms of investigations and sanctions by AQIS and LiveCorp can only be minimised in the future if the Standards Group is able to demonstrate to all stakeholders that it is prepared to take action, consult with others regarding the action taken and communicate to all stakeholders. The industry needs accurate and comprehensive information about livestock export related issues - including that relating to their own role in mitigating risks.

Stakeholders need to be involved to the maximum extent possible in the processes associated with the Standards Group to ensure transparency in the decision-making process. In addition, communication of all relevant matters to industry stakeholders will be necessary if the system is to be successfully implemented. The Standards Group will need to:

- Provide clear, factual advice and information about risks associated with the export of livestock;
- Maintain confidence and credibility of the Live Export Industry and the Standards;
- Consult stakeholders on processes associated with the Standards;
- Communicate decisions regarding such issues as accreditation, risk management and the amendments to the Standards to all industry participants; and
- Manage issues and media relations competently.

SUMMARY: Communication of all relevant matters to industry stakeholders will be integral to successfully implemented of the Standards Group policies.

REFERENCE MATERIALS

AFFA, AQIS, ALEC LiveCorp, MLA, AMSA (2002) An action plan for the livestock export industry

Anon., 2003. Animal Welfare home page, Queensland Department of Primary Industries. Accessed on 23 May 2003 at http://www.dpi.qld.gov.au/animalwelfare/.

Blood, D.C. and Studdert, V.P., 1988. Baillière's comprehensive veterinary dictionary. Baillière Tindall, London.

European Commission, 2000. First Report on the Harmonisation of Risk Assessment Procedures. Part 1: The report of the scientific steering committee's working group on harmonisation of risk assessment procedures in the scientific committees advising the European Commission in the area of human and environmental health. 26-27 October 2000., European Commission (Health & Consumer Protection Directorate-General), Brussells.Ewing, S.A., Lay, J., D.C. and von Borell, E., 1999. Farm Animal Well-Being. Prentice Hall, Upper Saddle River, New Jersey, 357 pp.

Hardaker, J.B., Huirne, R.B.M. and Anderson, J.R., 1997. Coping with risk in agriculture. CAB International, Wallingford, 274 pp.

Higgs, A.R.B., Norris, R.T. and Richards, R.B., 1991. Season, age and adiposity influence death rates in sheep exported by sea. Aust. J. Agric. Res. 42, 205-214.

Independent Reference Group, 2000. Australian Livestock Exports: Industry & welfare of animals report. http://www.affa.gov.au.

Independent Reference Group, 2002. A way forward on animal welfare: a report on the livestock export industry, Canberra.

Kelly, A.P., 1996. Mortalities in sheep transported by sea. PhD Thesis, University of Melbourne, Melbourne, 228 pp.

KPMG, undated. Risk management framework and methodologies, Melbourne.

LiveCorp, 2001. LEAP Handbook. Livestock Export Accreditation Program. Accreditation Rules and Australian Livestock Export Standards. March 2001. LiveCorp, Sydney.

More, S.J., 2002a. Evaluation and cost/benefit analysis of Rhinogard vaccine in preventing bovine respiratory disease in export cattle. Literature review prepared for Meat and Livestock Australia, Revision B, 26 April 2002. Project LIVE.111, AusVet Animal Health Services, Brisbane.

More, S.J., 2002b. Investigation of cattle deaths during Voyage 1 of the MV Becrux. Final Report prepared for Meat and Livestock Australia, Revision A, 23 September 2002., AusVet Animal Health Services, Brisbane.

More, S.J., 2002c. Salmonellosis control and best practice in pre-embarkation sheep feedlots. Final Report prepared for Meat and Livestock Australia, Revision D, 10 October 2002. Project LIVE.112, AusVet Animal Health Services, Brisbane.

More, S.J., 2002d. Salmonellosis control and best practice in pre-embarkation sheep feedlots. Literature review prepared for Meat and Livestock Australia, Revision B, 8 July 2002. Project LIVE.112, AusVet Animal Health Services, Brisbane.

More, S.J. and Brightling, T., 2003. Minimising mortality risks during export of live goats by sea from Australia. Final report prepared for Meat and Livestock Australia, Revision C, 14 May 2003. Project LIVE.215, AusVet Animal Health Services, Brisbane.

Norris, R.T., McDonald, C.L., Richards, R.B., Hyder, M.W., Gittins, S.P. and Norman, G.J., 1990. Management of inappetant sheep during export by sea. Aust. Vet. J. 67, 244-247.

Norris, R.T. and Norman, G.J., 2001. Livestock export trade from Australia: summary information for 2000. Miscellaneous Publication 15/2001, Agriculture Western Australia, LiveCorp, and Meat and Livestock Australia.

Norris, R.T. and Norman, G.J., 2002a. LIVE.206. Live export trade from Australia: summary information for 2001. Miscellaneous Publication 007/2002, Agriculture Western Australia, LiveCorp, and Meat and Livestock Australia.

Norris, R.T. and Norman, G.J., 2002b. LIVE.214. National livestock exports mortality summary - 2002., Agriculture Western Australia, LiveCorp, and Meat and Livestock Australia.

Norris, R.T., Richards, R.B., Creeper, J.H., Jubb, T.F., Madin, B. and Kerr, J.W., 2003. Cattle deaths during sea transport from Australia. Aust. Vet. J. 81, 156-161.

Norris, R.T., Richards, R.B. and Dunlop, R.H., 1989. An epidemiological study of sheep deaths before and during export by sea from Western Australia. Aust. Vet. J. 66, 276-279.

OIE, 2003. Terrestrial Animal Health Code 2003. Office International des Epizooties (World Animal Health Organisation). www.oie.int/eng/normes/MCode/A_summry.htm.

Richards, R.B., Hyder, M.W., Fry, J., Costa, N.D., Norris, R.T. and Higgs, A.R.B., 1991. Seasonal metabolic factors may be responsible for deaths in sheep exported by sea. Aust. J. Agric. Res. 42, 215-226.

Richards, R.B., Norris, R.T., Dunlop, R.H. and McQuade, N.C., 1989. Causes of death in sheep exported live by sea. Aust. Vet. J. 66, 33-38.

Stacey, C., 2000. Investigations of ventilation efficacy on livestock vessels. Literature review prepared for Meat and Livestock Australia. Project SBMR.002, Report No. 3472/00, MAMIC Pty Ltd, Brisbane.

Stacey, C., 2001. Investigations of ventilation efficacy on livestock vessels. Final report prepared for Meat and Livestock Australia, Revision C, 14 May 2002. Project SBMR.002, Report No. 3472/00, MAMIC Pty Ltd, Brisbane.

Stacey, C., 2002. Practical ventilation measures for livestock vessels. Report prepared for Meat and Livestock Australia and LiveCorp, Revision B, 16 May 2002. Project LIVE.211, MAMIC Pty Ltd, Brisbane.

Stacey, C. and More, S.J., 2002a. Investigation of ventilation efficacy on live sheep vessels. Literature review prepared for Meat and Livestock Australia, Revision C, 15 July 2002. Project LIVE.212, MAMIC Pty Ltd, Brisbane.

Stacey, C. and More, S.J., 2002b. Investigation of ventilation efficacy on live sheep vessels. Voyage 1 report prepared for Meat and Livestock Australia, Revision B, 26 July 2002. Project LIVE.212, MAMIC Pty Ltd, Brisbane.

Stacey, C. and More, S.J., 2002c. Investigation of ventilation efficacy on live sheep vessels. Voyage 2 report prepared for Meat and Livestock Australia, Revision A, 7 January 2003. Project LIVE.212, MAMIC Pty Ltd, Brisbane.

Standards Australia, 1999. Australian Standard®: Risk Management. AS/NZS 4360:1999. Australian Standards of Australia, Sydney.

Toma, B., Vaillancourt, J.-P., Dufour, B., Eloit, M., Moutou, F., Marsh, W., Bénet, J.-J., Sanaa, M. and Michel, P., 1999. Dictionary of veterinary epidemiology. Iowa State University Press, Ames.

APPENDICES

1. Developing a consignment risk management plan

2. Guidelines for incidence investigations

Appendix 1: Developing a consignment risk management plan

In keeping with international best-practice (Standards Australia, 1999; KPMG, undated), the following four steps need to be considered during the development of a risk management plan:

- Risk identification: Identifying risks associated with a particular consignment
- Risk analysis: Estimating likelihood and consequence for each risk
- Risk evaluation: Prioritising risks in order of importance
- Risk treatment: Identifying and assessing treatment options as well as preparing risk treatment plans

1. Risk identification: identifying adverse health and welfare outcomes that could be associated with a particular consignment

In this step, there is a need to identify all adverse health and welfare outcomes that could possibly be associated with the consignment. The following list provides some examples of health and welfare risks:

a. Physical health and welfare problems

- Injury
- Cold stress
- Heat stress

b. Biological health and welfare problems

- Starvation (conceivably associated with rejection of the ship at the destination port)
- Weight loss
- Inappetence (shy feeders)
- Feedlot-related salmonellosis
- Persistent inappetence- salmonellosis-inanition

A component of the risk management plan (PART A):

Risk identification
Adverse H&W outcome
1. 2. 3.

2. Risk analysis: estimating likelihood and consequence for each outcome

The objective of risk analysis is to separate minor (acceptable) risks from major risks, and to provide data to assist with risk evaluation and risk treatment (Standards Australia, 1999). This is undertaken by considering:

- *Likelihood:* Is this outcome likely to occur during this consignment?
  - 1: Rare (the outcome is likely to be rare)
  - 2: Unlikely

  - 3: Moderate
  - 4: Likely
  - 5: Almost certain (the outcome is almost certain to occur)
- *Consequences:* What would be the impact if this outcome were to occur?
  - 1: Insignificant (would have no significant impact on outcome targets)
  - 2: Minor
  - 3: Moderate
  - 4: Major
  - 5: Catastrophic (would have a catastrophic impact on outcome targets)

A component of the risk management plan (PART A):

Risk identification	*Risk analysis*	
Adverse H&W outcome	Likelihood	Consequence
1. 2. 3.		

3. Risk evaluation: prioritising outcomes in order of importance

The objective of risk evaluation is to produce a prioritised list of outcomes for further action. This is undertaken using the following risk rating table (from KPMG, undated), in combination with data generated during the previous step:

Likelihood	*Consequence*				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Significant	Significant	High	High	High
Likely	Moderate	Significant	Significant	High	High
Moderate	Low	Moderate	Significant	High	High
Unlikely	Low	Low	Moderate	Significant	High
Rare	Low	Low	Moderate	Significant	Significant

A component of the risk management plan (Part A):

Risk identification	*Risk analysis*		*Risk evaluation*
Adverse H&W outcome	Likelihood	Consequence	Risk rating
1. 2. 3.			

4. Risk treatment: Identifying and assessing treatment options as well as preparing risk treatment plans

As indicated in the Australian Standard (Standards Australia, 1999), risk treatment involves the following steps:

- identifying the range of options for treating (managing) each of the important risks;
- assessing these options;

- preparing risk treatment plans; and
- implementing them.

i. Identifying treatment options

In the case of live export, treatment options may be available at all stages of export, from on-farm through to shipboard practices. Furthermore, these options generally fall into one or more of the following categories:

- complete avoidance of the risk where practicable by deciding not to proceed with the activity that is likely to generate risk (*as an example, the risk of persistent inappetence-salmonellosis-inanition can be substantially reduced by deciding to exclude old, fat sheep from a consignment, particularly if undertaken during the second half of the year*)
- reducing the likelihood that the risk would occur (*as an example, compliance with best-practice during transport of goats from the property-of-origin will result in reduced likelihood of injuries*)
- reducing the consequence if this risk were to occur (*as an example, attention to feeding quality and quantity during feedlotting is likely to result in reduced consequences during and following an outbreak of feedlot-related salmonellosis*)

ii. Assessing treatment options

If a range of treatment options are available for each of the important risks, a number of factors need to be considered when selecting the most appropriate strategy(ies):

- the importance of the outcome, in terms of likelihood and consequence
- the effectiveness of each option (and available evidence to support this assertion)
- the cost of implementing each option against the benefits (in terms of reduced risk) derived from it.

As suggested in the Australian Standards (1999), it is unlikely that any one risk treatment option will be a complete solution for a particular problem.

iii. Preparing risk treatment plans

The risk treatment plan documents how the chosen treatment options will be implemented, and will need to be sufficient to satisfy independent audit. Building on suggestions from the Australian Standard (1999), the plan should identify:

- the adverse outcome to be addressed;
- the treatment option(s) to be used and evidence to support their effectiveness;
- the actions to be taken during the export process;
- resource requirements;
- responsibilities;
- schedules and timing;
- reporting and monitoring requirements.

The risk management plan (PART B):

RISK MANAGEMENT PLAN (PART B)	
Identified outcome	**Exporter:** **Consignment:**
Risk treatment 1. Treatment option(s) to be used 2. Evidence in support of the effectiveness of these options	
Action plan 1. Proposed action 2. Resource requirements 3. Responsibilities 4. Timing 5. Reporting and monitoring required	
Compiler	Date

Appendix 2: Guidelines for incident investigations

Modified from: More, S.J., 2002. Veterinary investigation of mortalities during live animal export voyages from Australia (a report completed as part of LIVE.215: Goat risk management). Meat & Livestock Australia and LiveCorp, Sydney, 16 pp.

1. Introduction

Much can be gained from a rigorous investigation of mortalities during live export. An understanding of cause is important. In addition, it should be possible to identify the specific reasons for voyage mortalities, thereby offering an opportunity to reduce losses on subsequent shipments.

> *A rigorous mortality investigation by the voyage veterinarian can assist in understanding why problem(s) occur and what can be done to reduce losses on subsequent shipments.*

This appendix provides an overview of key issues to consider during the veterinary investigation of mortalities during live export from Australia. These include the routine collection of voyage data as well as methods to consider during later analysis and interpretation. To maximise the effectiveness of any investigation, it is important to examine data from a variety of sources and to utilise a range of simple epidemiological and other methods.

2. The routine collection of voyage data

Because there is a vast range of data that could be collected during a live export voyage, it is important that data collection is sensitive to its most likely applications and subsequent analysis.

> *Data collection must be planned with care, based on a clear understanding of how these data are to be analysed and interpreted.*

2.1 General voyage data

- General voyage data includes:
- Background information (as available) for each class of animal at each port of loading, including history during and prior to feedlotting, properties-of-origin, on-farm preparation, age and wool length (if relevant)
- Background information about the performance of the consignment during feedlotting (mortality rate; pattern of mortality in time, in space and among different groups of animals; clinical signs; post mortem findings; weather; other relevant information)
- Load plan (with subsequent modifications)

2.2 Daily mortality data

Daily collection of mortality data is central to any voyage investigation. Although these data are routinely collected on all vessels, the value of these data is dramatically increased if mortality counts *for each species* are recorded by day, by class, by deck and by port of loading. The ship crew would generally be willing to collect data to this level of detail.

An example of such data is given in the following table, which has been extracted from an Excel spreadsheet. The table would continue to expand to the right with each additional day of sailing.

SHEEP												
By deck					Number of deaths each day							
	By class				0	1	2	3	4	5	6	7
		By port of loading			3-May	4-May	5-May	6-May	7-May	8-May	9-May	10-May
3					PORT					FREM		
	A wethers											
		Portland			1	2	1	10	2	10	9	14
	Ewes											
		Portland			1	1	0	0	0	3	0	7
2												
	B wethers				1	2	5	20	50	40	49	44
		Portland										
1	C wethers											
		Fremantle			1	1	0	0	0	3	0	7
	C wethers											
		Portland			1	0	5	6	6	8	6	7

The value is further increased if several additional columns were added, including:

- The total number of animals loaded in each of these categories (entered from the loading plan, taking account of any later significant modifications)
- The total number of deaths in each category (calculated using SUM in Excel)
- The voyage mortality for each category (again an Excel calculation)

The modified table would look as follows:

SHEEP												
By deck					*Total no.*	*No. of*	*Mortality*	Number of deaths each day				
	By class				*loaded*	*deaths*	*rate*	0	1	2	3	4
		By port of loading						3-May	4-May	5-May	6-May	7-May
3								PORT				
	A wethers											
		Portland			*6985*	*239*	*3.42*	1	2	1	10	2
	Ewes											
		Portland			*6833*	*85*	*1.24*	1	1	0	0	0
2												
	B wethers				*10235*	*583*	*5.7*	1	2	5	20	50
		Portland										
1	C wethers											
		Fremantle			*6833*	*85*	*1.24*	1	1	0	0	0
	C wethers											
		Portland			*7309*	*130*	*1.78*	1	0	5	6	6

Care is needed during the collection and collation of daily mortality data.

2.3 Other daily information

The collection of daily environmental data is important. Wet bulb temperature is the key measure of interest, but can be calculated later as long as dry bulb temperature and relative humidity are recorded. At a minimum, ambient information (collected at the bridge) is needed, although measurements of deck-level conditions can also be important.

			0	1	2	3	4	5	6	7
			3-May	4-May	5-May	6-May	7-May	8-May	9-May	10-May
			PORT					FREM		
Bridge										
		DB		*17*	*12*	*15*	*17*	*17*	*20*	*26*
		RH		*80*	*76*	*78*	*80*	*80*	*60*	*62*
		WB		*14.9*	*9.8*	*12.8*	*14.9*	*14.9*	*15.1*	*20.7*
Sheephouse										
		DB		*20*	*15*	*17*	*18*	*21*	*22*	*24*
		RH		*64*	*68*	*70*	*31*	*65*	*66*	*60*
		WB		*15.7*	*11.7*	*13.7*	*9.6*	*16.7*	*17.7*	*18.6*

To assist with later calculations, this information can be entered on the same spreadsheet as the mortality data.

			0	1	2	3	4	5	6	7
			3-May	4-May	5-May	6-May	7-May	8-May	9-May	10-May
			PORT					FREM		
Bridge										
		DB		*17*	*12*	*15*	*17*	*17*	*20*	*26*
		RH		*80*	*76*	*78*	*80*	*80*	*60*	*62*
		WB		*14.9*	*9.8*	*12.8*	*14.9*	*14.9*	*15.1*	*20.7*
Sheephouse										
		DB		*20*	*15*	*17*	*18*	*21*	*22*	*24*
		RH		*64*	*68*	*70*	*31*	*65*	*66*	*60*
		WB		*15.7*	*11.7*	*13.7*	*9.6*	*16.7*	*17.7*	*18.6*

6985	*239*	*3.42*	1	2	1	10	2	10	9	14
6833	*85*	*1.24*	1	1	0	0	0	3	0	7
10235	*583*	*5.7*	1	2	5	20	50	40	49	44

Computerised spreadsheets can greatly assist with the collection of data during the voyage.

The Captain's log also contains daily information that may be relevant to an investigation, particularly on an open-sided vessel, including:

- Ship position (latitude, longitude)
- Ship direction and speed
- Apparent wind direction and force

2.4 Clinical and post-mortem results

Veterinarians are keen observers of clinical disease. This information would be critical to any voyage investigation, but would be of greatest value if it had been recorded. Therefore, it is suggested that the voyage veterinarian maintain a simple daily log which provides an ongoing record of clinical ideas and impressions. Records should also be kept, on a daily basis, of treatments and other relevant events.

a. Post mortem technique

The following information, summarised from an article by Cor Lenghaus[31], provides a useful outline of post mortem technique, with special reference to small ruminants:

> *By convention, small ruminants are autopsied in left lateral recumbency (left side down) so that the rumen is underneath other abdominal viscera. Reflect the right front and hind leg, disarticulating the hind limb at the coxo-femoral joint, and the skin on the right side of the body, the neck and face. Cut and either reflect or remove the right side abdominal muscle (with the initial incision following the line of the ribs, the lumbar muscles and continuing to the anterior midline attachment at the pubis).*
>
> *Dissect the tongue, oesophagus and trachea, and reflect to the thoracic inlet. Examine the thyroids. Remove the right side of the diaphragm and, using pruning shears, the right half of the rib cage. Check for pliability and fragility of the ribs. Cut the mandibular symphysis and retract the jaws laterally to expose the molars and hard and soft palate. Disarticulate the head at the atlanto-occipital joint and remove the brain if necessary. Open and examine the hock and knee joints. Open the pericardial sac and check for excessive pericardial fluid.*
>
> *Major dissection is now complete. Prior to detailed inspection of internal organs, conduct an overview of visible organs* in situ *noting any abnormality in size, shape, colour and position. Systematically eviscerate the carcass and (as they become available) hollow viscera [including trachea, bronchi, heart and major vessels, alimentary tract, bladder, reproductive organs] should be opened to allow inspection of the inner surfaces. Free the oesophagus and remove and inspect the heart, lungs and trachea. Transect the abomasum at both its proximal and distal ends and remove by careful traction and blunt dissection. Transect the large intestine and remove both the small and large intestines in their entirety, after carefully dissecting from the liver and cutting the root of their mesenteries. Remove the oesophagus and forestomach. Examine the remaining organs, including urinary bladder, kidneys, reproductive organs, adrenals and liver.*

Sound post mortem technique is important.

b. Collection of other data

To assist during any subsequent investigation, it is important when conducting each post mortem to note the date and animal category (class, deck and port of loading) and to link this information with any subsequent clinical and post mortem record and laboratory samples.

c. The collection of samples for histopathology

To maximise the value of post mortems at-sea, it is critical that samples are routinely collected for histopathology. Based on advice from Barry Richards, Chief Veterinary Pathologist with the Department of Agriculture in Western Australia, sample collection during live export should be restricted to formalised samples. Based on detailed experience over many years, Barry is confident that histopathological assessment will assist in most cases. Also, there are significant logistical problems associated with the storage and re-importation of non-formalised samples.

[31] Lenghaus, C., 1987. Post mortem technique, with special reference to sheep. In: Proceedings No. 97, 'Through the naked eye', Gross pathology of domestic animals, 18-22 May 1987. The Postgraduate Committee in Veterinary Science, The University of Sydney

Using large (at least 500 mL) containers, Barry recommends that each of the following tissues are collected:

Liver	Adrenal gland	Jejunum
Kidney	Terminal mesenteric lymph node	Ileum
Heart	Rumen	Caecum
Lung	Abomasum	Colon
Spleen	Duodenum	

A range of appropriate samples should be routinely collected during post mortem, for histopathological assessment on return to Australia.

d. Number of animals to post mortem

Professional judgement will be needed when determining the number and type of animals to post mortem and sample. During a 'normal' voyage up to 30 post mortems (with associated samples for histopathology) may be needed to enable a clear understanding of the presentation and patterns of death in time, in space and among different types of animals.

2.5 Resource implications for the voyage veterinarian

The following resources are needed during data collection:

- Formalin (10%, buffered)
- 500 mL containers
- Basic post-mortem equipment, including knife, steel and stone, scalpel handles and blades, pruning shears, multitest dipstick)
- Reference material (general medicine texts)
- Means to record data on hardcopy and electronically (paper, computer, reasonable skills with MS Excel or equivalent)

3. Analysis and interpretation of voyage data

3.1 An overview

During an investigation into mortalities or other problems during live export voyage, data analysis and interpretation can be used to gain an understanding of causation, and to identify strategies to minimise the risk of similar problems in future shipments.

The steps in a disease investigation have been previously described by Chris Baldock[32] and are presented below. In the following sections, examples are presented to illustrate key components of this approach.

1. *The diagnosis:* establish or verify a diagnosis;

2. *Define a case*: criteria – clinical, autopsy or laboratory findings – are needed to define a case;

3. *Confirm the outbreak:* confirm that an outbreak is actually occurring;

[32] Baldock, C., 1991. Investigation of disease outbreaks. In: Vet Update '91. The University of Queensland.

4. *Time, place, animal:* characterise the outbreak in terms of:

- *time* (develop an epidemic curve)
- *What is the exact period of the outbreak?*
- *Given the diagnosis, what is the probable period of exposure?*
- *Is the outbreak most likely common source, propagated or both?*
- *location* (.. determine the spatial distribution of disease)
- *What are the significant features of the geographical distribution of cases?*
- *What are the relevant attack rates?*
- *animal* (.. calculate a series of group-specific attack rates after grouping animals according to different characteristics such as age, sex, breed, coat colour etc)
- *Are there any characteristics about groups of animals for which specific attack rates vary?*
- *Which groups have the highest and which have the lowest attack rates?*

  This step involves measuring disease frequency and documenting the patterns;

5. *Analysing the data:* this step involves calculating factor-specific attack rates and constructing an attack rate table;

6. *Working hypothesis:* formulate a working hypothesis.

   The working hypothesis should address issues such as:

- *the type of epidemic:* whether it a common source or propagating epidemic
- *the possible source:* if it is a common source, whether is it due to point or multiple exposure
- *the mode of spread:* whether the mode of transmission is by contact, vehicle or vector;

7. *Intensive follow-up:* undertake intensive follow-up investigations.

   This may include further epidemiological analyses as well as clinical, pathological, microbiological and toxicological work-up;

8. *Control and prevention:* implement control and preventive measures; and

9. *Reporting:* the findings need to be reported with recommendations for dealing with future possible outbreaks of the same disease. For substantial investigations, the report should contain the following sections:

- background
- methods
- results
- hypothesis
- financial impact (where appropriate)
- recommendations
- appendices (containing laboratory reports etc)

  This is the step that is frequently ignored. However, an understanding of the problem by other veterinarian would help to prevent further outbreaks in the future.

A disease investigation generally follows a series of logical and well-recognised steps.

3.2 Utilising clinical and post mortem information

At times, it is possible to determine the cause of the mortalities based on clinical and post mortem information. In such situations, based on accepted disease information, it may also be possible to identify risk factors for disease occurrence and successful strategies for risk minimisation. More commonly, however, even if the disease has been identified, it will be necessary to conduct further analysis in an effort to the reason(s) why the disease has occurred. As indicated previously, epidemiological evidence can provide clues as to disease causation. Similar comments can also be made concerning clinical and post mortem information.

Clinical and post mortem information form part – but not all – of a rigorous voyage mortality investigation.

3.3 Analysis and interpretation of epidemiological data

Underpinning the principle of epidemiology is the key assumption that disease is not a random event. Therefore, by understanding the pattern of disease occurrence, it is generally possible to identify clues with respect to disease causation. These clues are used to form and test hypotheses.

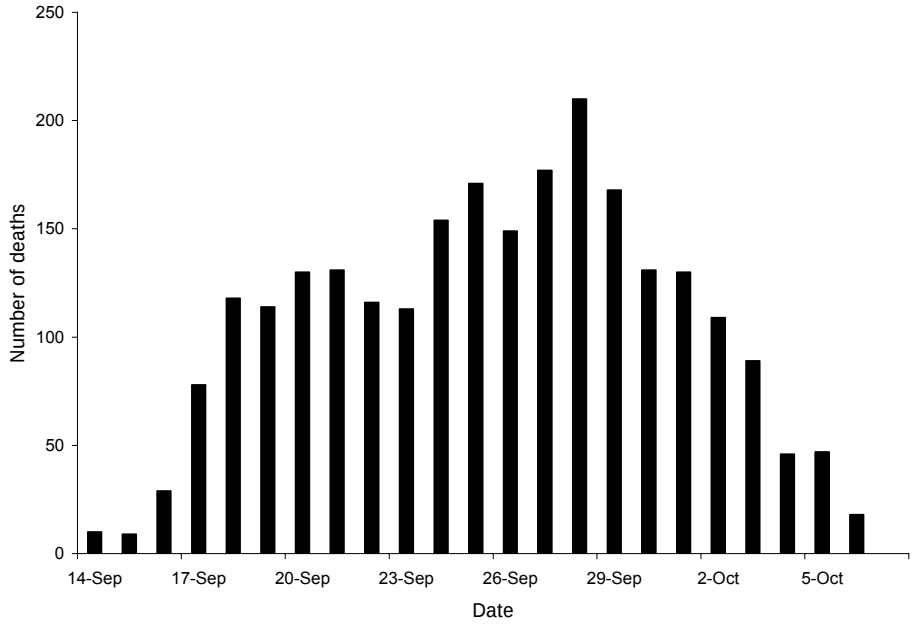
Epidemiological information is central to any rigorous voyage mortality investigation.

During analysis of epidemiological data, the aim is to investigate the possibility of patterns in time, in space and among a range of animal characteristics. Epidemiology is interested in both 'numerator' and 'denominator' information. In addition, there is a need to determine the unit of interest (generally the individual animal) and to define a 'case'. In investigations into *voyage mortalities*, a case would be defined as a dead animal.

Epidemiology is underpinned by the assumption that disease is not a random event. Consequently, an understanding of patterns of disease occurrence (in time, in space and among different classes of animals) can generally provide clues with respect to disease causation.

3.1 Patterns in time

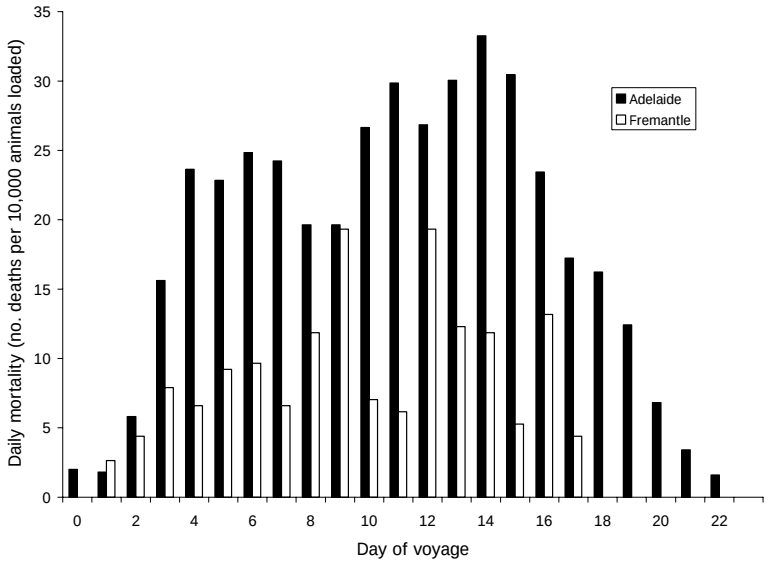
Patterns in time are generally investigated using an epidemic curve (y-axis: days of voyage or date; x-axis: number of new cases during each time period). The following epidemic curve comes from a sheep voyage:



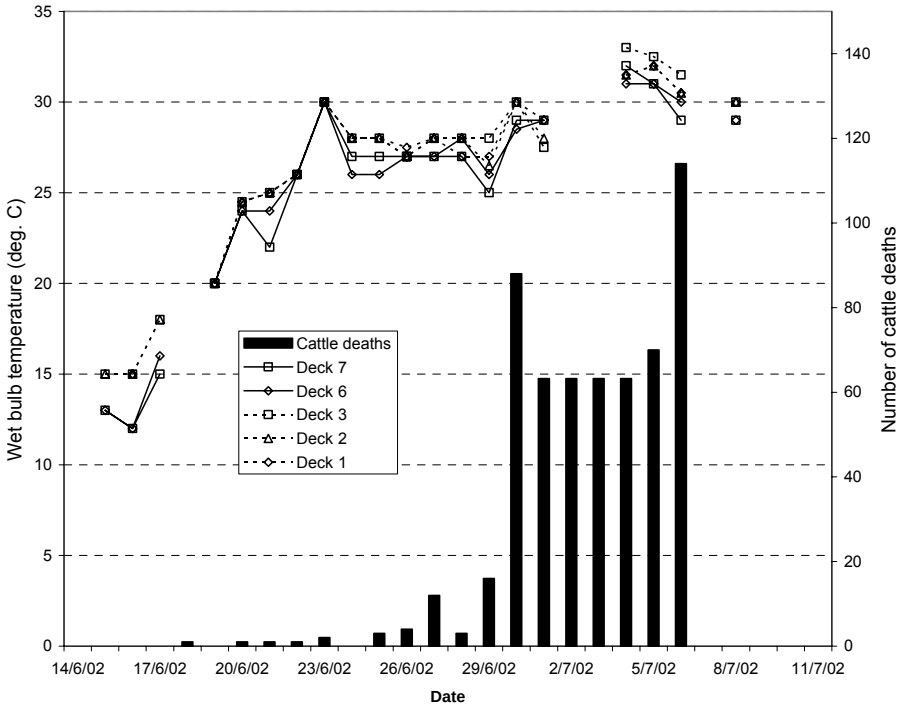
Certain diseases follow particular patterns in time. Based on current understanding, feedlot-related salmonellosis during live sheep export is mainly a concern during the first week or so at sea, and represents a 'spill-over' from the feedlot. The persistent inappetence-salmonellosis-inanition (PSI) complex generally presents as losses later in the voyage, following the eventual demise of persistently inappetent animals. The losses from primary heat stress would be coincident with rising or extreme deck wet bulb temperatures, and may present as catastrophic losses over a short period of time.

Patterns of mortalities in time can be assessed by examining an epidemic curve.

It is possible to further examine these epidemic curves in order to evaluate hypotheses more carefully. In the voyage presented previously, there was concern that mortality was significantly different between ports of loading. Because there were significant differences in the number of animals loaded at each port, the y-axis of the epidemic curve was recalculated according to daily mortality rate (rather than daily number of deaths), and the x-axis as days of voyage (rather than date).

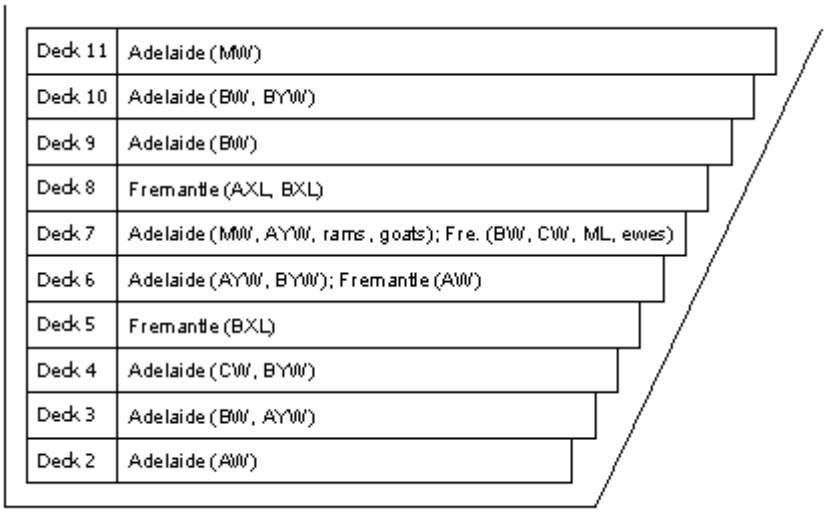


The epidemic curve can be further evaluated by overlaying key events that occur in time. The following epidemic curve, which includes daily wet bulb temperatures, represents losses during a voyage with significant heat stress problems.

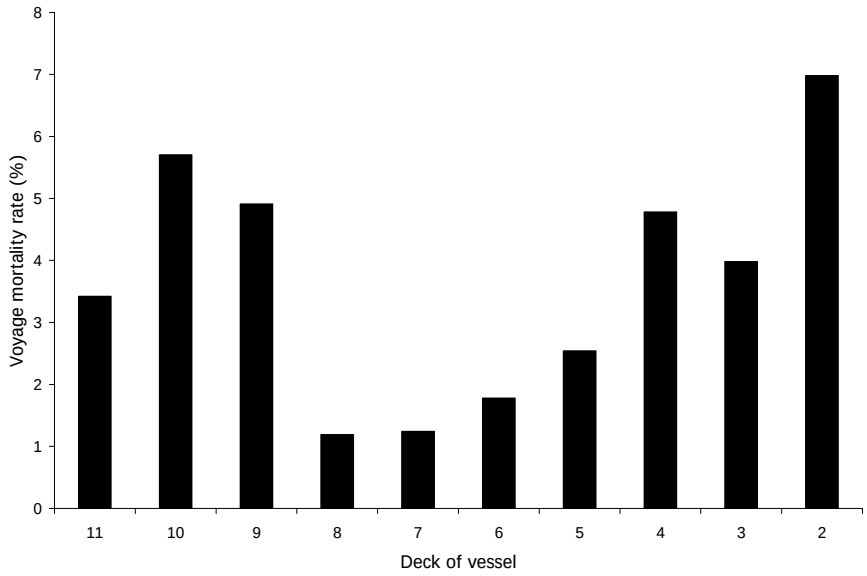


Patterns in space can provide important clues about disease causation, including evidence suggestive of a point-source or propagating epidemic.

Patterns are important at both the macro and micro level. At the macro (ship) level, simple maps/diagrams can assist, both in terms of describing how the population varies in space as well as spatial patterns in disease occurrence. The following diagram provides a simple 'map' of the pattern of loading, with a concentration of Fremantle-loaded animals on the central decks.



Simple histograms will also assist in identifying particular patterns:

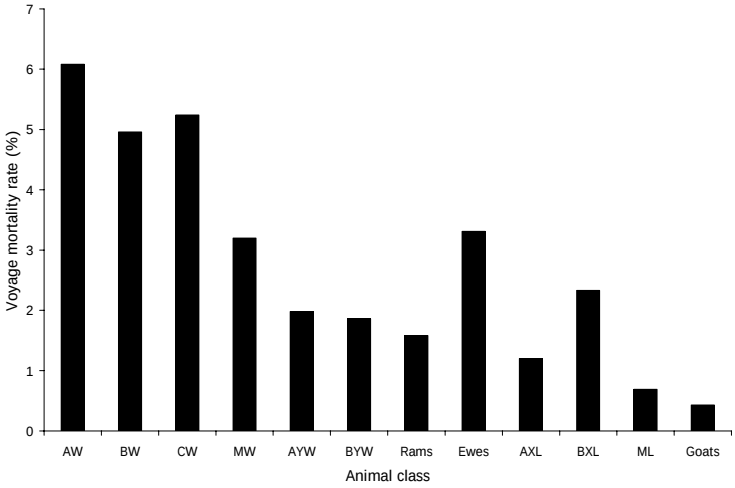


At the micro level, the pattern of deaths or disease within a pen or deck over time can assist to rule in or out particular diseases, based on our understanding of their behaviour over time in a population.

> *Patterns in space can be assessed both at the macro (ship) and micro (pen or deck) level.*

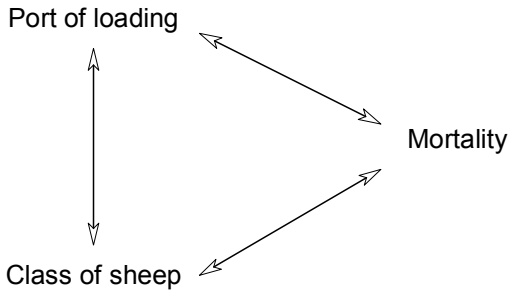
A range of animal characteristics would be of interest, including class, age and/or sex. Given the nature of the industry, it is not normally possible to categorise animals into lines or properties-of-origin, although this may sometimes be possible.

Again, it is generally not necessary to use other than simple methods to identify patterns. The following histogram demonstrates that the older wethers (AW, BW, CW and MW) and the ewes were at greatest risk of dying during this particular voyage:



A range of animal characteristics may be of interest in a voyage investigation, including class, age and/or sex.

Confounding is often a problem during outbreak or mortality investigations. Confounding occurs when two variables are 'confused' or 'entwined' in terms of their effect on the outcome of interest. During one shipment, for example, mortality was associated with port of loading and also with class of animal. Confounding would be present, as illustrated below, if there were an association between class and port of loading, as would occur if the class of concern (for example, older wethers) were mainly loaded at the 'problem' port.



Confounding must be considered when interpreting epidemiological information. It occurs when two variables are 'confused' or 'entwined' in terms of their effect on the outcome of interest.

These effects can often be unravelled using a range of methods, including stratified analyses.

As illustrated in the table below, old wethers from Adelaide are at much greater risk than similar wethers loaded in Fremantle (relative risk as high as 10). Supporting information will be needed to determine whether it is characteristics of the Adelaide sheep per se or other factors relating to the Adelaide loading that are the cause of high losses in these animals.

Class of animal	Port of loading						Relative risk
	Adelaide			Fremantle			
	Total	Av. weight (kg)	Voyage mortality (%)	Total	Av. weight (kg)	Voyage mortality (%)	
Wethers							
AW	2808	67.9	7.0	446	69.0	0.7	9.97
BW	23104	56.5	5.2	1148	58.9	0.7	7.43
CW	4358	52.4	5.3	219	52	2.3	2.30
MW	7582	66.9	3.3				-
AYW	5211	57.0	1.9				-
BYW	4517	49.1	1.9				-

3.4 Resource implications for the voyage veterinarian

The following resources are needed during data analysis and interpretation:

- Computer access and computing skills
- Sufficient time to enable the investigation and report to be completed

4. The development of a voyage investigation report

It is important to clearly document 'lessons (that have been) learned' from each voyage, hence the value of the voyage investigation report. To maximise the value of each report, a structured approach is needed, as suggested by Baldock, covering each of the following sections:

- background
- methods
- results
- hypothesis
- financial impact (where appropriate)
- recommendations for control and prevention
- appendices (containing laboratory reports etc)

> *A voyage investigation is not complete until the report is finished. The report should cover a defined series of points, as suggested in the text.*