

**Live Trade Animal Welfare Partnership
2009/10**

Final report – Public Release

Indonesian point of slaughter improvements



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Executive Summary

Indonesia is Australia's largest live cattle export destination. A key focus of the MLA and LiveCorp Livestock Export Program (LEP) is to ensure that suitable facilities are available for the processing of Australian animals so that they are handled and slaughtered humanely. These are also key concerns of the livestock export industry and the Indonesian importers and feedlotter. Significant improvements have been made at the point of slaughter over the past 3 years through the installation of 96 restraining boxes and the development of Standard Operating Procedure (SOP) training modules.

This project builds on the investments made by the Australia Government and the livestock export industry to improve animal welfare in Indonesia. It focused on reviewing and maintaining the existing restraining boxes, assessing the need for additional infrastructure to improve animal welfare including installation of 10 Mark I restraining boxes, delivering training in SOPs to 50 locations and investigating the feasibility of implementation of stunning. This project also conducted an independent assessment of the effectiveness of the projects delivered in South East Asia (to date) in delivering improved animal welfare outcomes; including facilitating a tour of the region by a team of independent animal welfare experts (4) to observe and report on improvements and the effectiveness of industry and government investments.

Objectives

This project will build on the investments made by the Australia Government and the livestock export industry to improve animal welfare in Indonesia. It will focus on reviewing and maintaining the existing restraining boxes, assessing the need for additional infrastructure to improve animal welfare including restraining boxes, delivering training in SOPs and developing a pilot stunning project. This project will also undertake an independent review of the animal welfare conditions in Indonesia.

Milestone 1 – Facility inspections, upgrades and training

Activities

Assess 50% of the facilities processing Australian cattle through restraining boxes and conduct repairs, upgrades and SOP training. Inspect additional locations processing Australian cattle and install additional infrastructure, including restraining boxes as required.

KPI

- Key facilities identified and assessed.
- Assessment identifies, prioritises and recommends achievable improvements required to assist a facility in meeting OIE standards; and provides a schedule of material costs and time estimates for improvements.
- Improvements delivered to slaughterhouses that promote better handling and slaughter of Australian cattle, including ramps, races and slaughter tables.
- Management and operational staff understand the efficiency and welfare benefits of improved infrastructure and handling/slaughter practices.
- Independent assessment conducted and areas requiring additional investment documented and prioritised.
- Final report explains how the milestone activities have improved animal welfare outcomes.

Project outcomes

Assessments

The initial step of this milestone was to conduct a review of the locations where restraining boxes have been installed as well as identify new locations where Australian cattle are being processed.

As part of the initial establishment of the restraining box program in Indonesia a local animal welfare taskforce was established in 2006 in conjunction with the Indonesia Feedloters Association (APFINDO). The role of the taskforces is to respond to the requests of APFINDO members who have identified processing facilities that require restraint facilities to improve the processing of Australian animals, conduct assessments of these locations, construct and install the boxes where required and provide training to the recipients of the restraining boxes. The Livestock Export Program (LEP) provides ongoing support to this taskforce and it has been a critical factor in the success of the restraining box program and has been an integral part in the delivery of this milestone.

The review process for this milestone involved a mix of assessments by Australian consultants, local contractors and recommendations from APFINDO members or the taskforces on locations that required improvements. The assessments involve reviewing the entire establishment and identifying areas that require improvements to deliver better animal welfare outcomes. The key areas assessed are:

- Discharge facilities into the lairage and lairage infrastructure.
- Raceways leading to slaughter floor.
- Existing restraining box equipment and slaughter floor infrastructure.
- Suitability for new or additional restraining boxes.
- Slaughter staff assessed on skill and ability to use slaughter facilities correctly.

APFINDO members are continually identifying and advising the task force of locations processing Australian animals. A priority list of new locations is in place and are assessed and reviewed by the taskforce on an ongoing basis. The taskforce assessments involve a survey and appraisal of the site location and then drawings are prepared of before and after layout so the taskforce can plan installations. A number of the locations on the APFINDO priority list have not been progressed to date as the LEP has been conducting a review and implementing improvements to its restraining box design.

In addition to inspecting new locations assessments are conducted of existing facilities to review the establishment and identifying areas that require improvements. Reviews and assessment have been conducted in 85 facilities (covering 98 restraining boxes) since 1st July 2009.

Restraining box update

The Mark 1 restraining box is a simple addition to abattoir infrastructure that improves animal welfare outcomes during the slaughter process. Constructed from durable galvanised steel, the boxes are an affordable and workable tool to improve welfare practices at slaughter. The restraint box is designed to enable casting of the animal, brought about by its exit through the side door, once the catch has been manually released by the stockman. Ropes are attached to two legs prior to door release. The length of the front rope arrests forward movement of the leg and the momentum of the animal initiates a roll out towards the slope of the plinth. The animal is restrained by a combination of its own weight on the sloping plinth and the tension on the casting rope. Following casting, a rope is usually placed around the head, neck and horns, or the head is manually restrained by the stockman. Downward pressure by the stockman prevents any attempt by the animal to regain posture.

While the Mark I box has made a significant improvement on traditional slaughter, finding better methods of restraint with higher animal welfare outcomes is essential. This has been an ongoing priority for the LEP and the livestock export research and development program has been undergoing the design and trialling of new boxes in unison with this milestone. The key element of the Mark I design which is being addressed is the casting method and the implementation of a more controlled process of getting the animal from the standing position to recumbency. Any new design needs to maintain the simplistic nature of the Mark I box and to operate without electrical power (due to the nature of the locations receiving the boxes).

A Mark II design concept was developed and trialled in Indonesia. The Mark II box design converts the swinging door of the Mark I to a tilting door controlled by a counter weight mechanism. While the pilot Mark II worked well for certain weights of cattle the counter weight mechanism was not flexible enough to allow for varying sizes of cattle. This created a situation where for cattle of heavier weights, the welfare outcomes during the casting process were not acceptable. After a number of redesign attempts to address the variable weight issues, this design concept was not progressed. A Mark III design concept was also developed; however, it was also not progressed due to perceived complications in the role over mechanism.

Through the process of reviewing the Mark II, a new design concept based on a calf cradle/bull table, was designed. The new design uses a clamping mechanism similar to a calf cradle to position the animal on a tilting door of the box which is then rotated using a simple hydraulic ram. The new design (Mark IV) was constructed and trialled in Australia and then this was followed by a trial conducted in Indonesia. The trial in Indonesia was successful with a number

of small issues with the design identified to improve the use of the box. The slaughter staff accepted the new design and found it simple to use.

This process of improving the box design has taken longer than expected and has occupied the resources of in-market personnel that would have been focused on the delivery of this milestone. It was the intention of the LEP to install the new design calf cradle boxes as part of this project; however the design was not completed in time. However, four new design boxes have been ordered and are being constructed in Australia during June. These boxes will be delivered to Indonesia in July and will be installed at locations that have higher throughput of cattle and are able to maintain the box.

Improvements conducted

Following the assessments, improvements have been implemented through a process of prioritisation. This process is conducted through consultation with LEP, APFINDO and the reviewed facility to identify areas of improvements that will make the greatest improvement on animal welfare. Facilities without any suitable infrastructure at the point of slaughter for the processing of Australian animals are the first priority. Then locations with slaughter equipment that require upgrades or repairs are addressed followed by improvements to lairage.

Instillation of new restraining boxes are conducted through the Indonesian animal welfare taskforce following the full site survey and appraisals. The taskforce undertakes the construction, delivery and instillation of the box. The box is then commissioned through the training of senior slaughter staff in the correct operating procedures.

Mark I boxes have been installed in 10 locations with 4 additional boxes constructed and being installed in June and July. This takes the total number of boxes installed in Indonesia up to 109. Four new calf cradles have been constructed as part of this project and will be installed as part 2010/11 projects.

Repairs and maintenance has been conducted on an ongoing basis. Regular inspection and SOP visits have enabled the identification and rectification of minor issues with regard to the boxes, cradles and other areas of the slaughterhouse such as yards and raceways.

In some instances where it was expected the government or private owner would have completed work that was additional to the installation of the restraining box, we have had to fix issues (such as lairages and raceways) to enable the box to be used. Other repair and maintenance issues have been of a more simple nature – rusting of a joint of other minor breakdown. Sometimes the wheels of cradles have to be replaced. Issues such as blunt knives have also been addressed and in some needy cases, we have provided an appropriate knife and stone. In some cases, when it is pointed out that ropes have been worn out – the local operator will replace them.

Members of the installation team are engaged to complete repairs when an issue is identified. In recent months, the Australian consultant has also assisted in on the spot rectification problems to ensure boxes can continue to be used.

Standard operating procedure (SOP)

Successful restraint is an interaction between the equipment used, the slaughterman and the behaviour of the animal. The design and operation of the cattle restraining boxes is a small part of the overall handling, casting and slaughter process. The skill and experience of the stockmen is essential regardless of the equipment that is used. Training the slaughterman in the correct use of the restraining box has been a key focus of the program.

This Standard Operating Procedures (SOP) cover handling of animals upon arrival at slaughter facility, pre-slaughter animal management in lairage, restraining box preparation prior to slaughter, correct procedure for restraint in restraining box and correct slaughter technique to

maximise animal welfare. SOP training has been delivered by locally engaged slaughter experts and supported by Australian expertise. The training has been conducted with slaughterhouse staff covering a total of 50 restraining boxes, 31 restraining boxes in Java and 19 restraining boxes in Sumatera since 1st July 2009.

Summary of benefits from the training as observed by the trainers:

- Teaches the slaughtermen on user safety when handling Australian animals and the operation of the restraining box.
- More efficient and effective – reduced stress in the animals and quicker processing time for the staff.
- More hygienic slaughter process with the use of cradle – the carcass does not touch the floor.
- Only need 2 – 3 people to operate restraining box – less staff required than traditional method.
- Use less rope – smaller ropes and less pressure on rope - cost saving
- Stress to cattle is reduced – through more efficient casting of the animals and a quicker processing time from confinement to point of death.
- Importance of sharp knives and increased understanding of the bleeding process.

Animal welfare outcomes

This program has delivered improved animal welfare outcomes for Australian livestock being processed in Indonesia.

The use of the Mark I restraining box improves the casting process and when used by correctly trained staff is an improvement on traditional slaughter methods. Australian livestock are larger and behave differently to local animals. Providing the Indonesian slaughtermen with a mechanism to control the animal allows them to work more confidently and improves the operator safety.

The addition of the new Mark IV version of the restraining box will provide additional welfare improvements with a controlled casting process. Due to the additional cost of the construction of this design and added complexity it will only be suitable for locations with higher through put and suitable infrastructure.

The SOP training is a critical component to delivering improved welfare outcomes. Suitable training of slaughter floor staff ensures that the delivered equipment is being correctly used and that the improved welfare potential is being achieved.

KPI Report

KPI	Activity	Status
Key facilities identified and assessed.	85 facilities were identified, inspected and assessed.	Complete
Assessment identifies, prioritises and recommends achievable improvements required to assist a facility in meeting OIE standards; and provides a schedule of material costs and time estimates for improvements.	Assessments were prioritised based on the improvements required, being repairs and maintenance, new restraining boxes or training needs	Complete
Improvements delivered to slaughterhouses that promote better handling and slaughter of Australian cattle, including ramps, races and slaughter tables.	10 Mark I restraining boxes installed and 4 Mark IV boxes constructed. Repairs and maintenance was conducted on an ongoing bases	Complete
Management and operational staff understand the efficiency and welfare benefits of improved infrastructure and handling/slaughter practices.	SOP delivered has been delivered a 50 restraining box locations.	Complete
Independent assessment conducted and areas requiring additional investment documented and prioritised.	Independent assessment conducted as per Milestone 3.	Complete
Final report explains how the milestone activities have improved animal welfare outcomes.	Final report submitted	Complete

Milestone 2 – Stunning trial

Activities

Carry out feasibility study of conducting pre-slaughter stunning trials of cattle in Indonesia – likely considerations include (but not limited to): benefits of stunning; process of engagement with religious authorities, local government authorities and slaughter facility management and staff; suitable locations for stunning trials in the future; analysis of potential factors affecting the successful adoption of stunning across the region in the future, including recommendations for addressing the factors identified. Identify the first locations for stunning trial and conduct trial.

KPI

- Feasibility study completed, locations for stunning trial identified and trial conducted, staff trained in use of stunning equipment.
- Final report details findings of feasibility study and explains how the milestone's activities have improved animal welfare outcomes.

Project outcomes

The implementation of stunning in slaughterhouses processing Australian animals is a priority for the Australian livestock export industry. Stunning is a complex issue within Muslim countries and an appropriate level of sensitivity to the issues needs to be considered when addressing this issue. This milestone has allowed the LEP to begin to raise the importance of this concept in Indonesia and gain a greater understanding to the issues surrounding its implementation. While stunning has an ideal animal welfare outcome, there are significant impediments in Indonesia to slow the movement to a more constrained slaughter practice. A stunning trial was not conducted however the foundation has been laid to ensure that this important activity can be progressed.

This milestone contracted a locally engaged Australian expert who is currently employed by one of the modern processing facilities which currently practices stunning. This expert has good local knowledge of the domestic abattoir facilities and speaks fluent Bahasa. As this expert is employed by a facility that is practising stunning he has access to stunning equipment and power loads which will make initial trials easier to conduct.

Stunning in Indonesia

Stunning is accepted in Indonesia and there are currently four abattoirs licensed to use pre-slaughter stunning. These facilities are licensed by the Halal certifying body – Indonesia Ulema Council (MUI) to use stunning prior to slaughter. These facilities are modern processing operations and produce high value vacuum packed chilled beef predominantly sold into the retail and food service market in Indonesia. MUI looks favourably at these facilities as they are professionally managed, modern and processing meat that will be judged on its eating quality. MUI conducts annual inspections to renew their Halal certification.

These registered facilities use one of two methods of stunning;

- **Percussion captive bolt mushroom head stunner** (use of blank cartridges to fire mushroom head bolt).
- **Pneumatic captive bolt mushroom head stunner** (driven by electricity and air pressure to activate the mushroom head bolt).

These facilities have a slaughter capacity of between 30 to 100 head per day. Such throughput enables the operators of stunning equipment to develop and maintain necessary skills to

proficiently use this equipment. Stunning equipment needs to be maintained and treated carefully. The slaughtermen also need to be sufficiently trained in the use of the equipment as the positioning in the animal's head is important for an effective stun. These modern facilities have purpose built restraining boxes to constrain the animal before stunning.

Indonesian processing sector

Despite recent developments, the Indonesian processing sector is very fragmented and quite rudimentary. Workers in the beef processing sector are from a low socio economic group with little formal education. There is little investment in infrastructure and costs are minimised to do things just to survive.

The Dutch introduced the development of abattoirs in the early 1900's that were grand structures but based on the traditional slaughter methods where a team of people slaughter and process one animal at a time. Some of those abattoirs built in 1910's still survive today. During the 1980 and 90's Japan provided aid to build and mechanise a number of government slaughterhouses. Those projects failed as the facilities were not maintained and the throughputs were much less than anticipated.

Until 1998 the Indonesian government controlled the abattoirs and slaughterhouses, then, during the Asian financial crisis, the government allowed the industry to be decentralised. The Indonesian Government continues to maintain a number of facilities but many private slaughtering facilities have sprung up across the country. Many are very small, often just extensions of cattle holding yards.

Halal slaughter is practised whereby the animal is walked into the slaughter floor, ropes are used to position the animal in a recumbent position and it is slaughtered. Local cattle and buffalo processed in this manner are very quiet, enabling them to be easily handled and correctly positioned for slaughter. Australian cattle imported into Indonesia, on the other hand are not used to human handling and prove difficult to be processed in a traditional manner. Traditional methods had to be modified to enable the animal to be more effectively restrained before slaughter.

In 1999 an Australian consultant to MLA/LiveCorp, introduced the Mark I restraining box concept. Over the next few years 15 or so boxes were put in position in abattoirs and slaughterhouses. This early work led to the development of the current restraining box program.

Issues with implementation of stunning

During discussions with the Indonesian livestock industry a number of significant practical issues have been raised.

Equipment – The hand held captive bolt stunner is considered as a weapon in Indonesia and needs to be kept under close guard. Both types of stunning equipment, the pneumatic stunner in particular, have a high capital cost beyond the means of abattoirs processing only a few animals each night. The pneumatic stunner is not a practical solution for the many abattoirs that process less than 20 cattle per night.

Power loads – there is no legal avenue to import power loads into Indonesia. The power loads also add additional costs and are comparatively expensive for the small scale butchers. Slaughtermen prefer to save cost by using traditional slaughter methods.

Facilities – There are a large number of small facilities in Indonesia and many of the locations have limited power. There is also limited ability to appropriately store the stunning equipment to prevent misuse or theft. While it could be expected that government run abattoirs may be suitable locations to introduce stunning, they are mostly poorly run and managed and where private butchers use the government facilities and pay a per head fee to slaughter at that facility.

Effective use of stunner – Ensuring that there are appropriately training staff in the effective use of the stunner in many of the facilities in Indonesia would be difficult to achieve. Due to the number of locations and the limited throughput of many of the facilities infrequent use of the stunner will lead to poor practices. Even with regular use of a stunner, there are occasions when effective stunning is difficult and can lead to potential welfare issues.

Existing restraining boxes – A further practical issue in abattoirs that currently have restraining boxes is that the box needs to be tighter fitting to minimise animal movement to allow the operator to correctly position the stunner for optimal effect.

MUI attitude - MUI will have issues with the abattoirs we are working with as they are not sophisticated and believe they should continue with the traditional slaughtering process without stunning.

Potential stunning sites

Discussions have been held at two sites that have been identified as potential sites for stunning trials. At the first site, the veterinary representative was interested in the concept, however the representative declined to take part in a trial as there was concern that the stunner may actually cause death. Discussions have also been held with a second abattoir and they have shown some interest.

The locally engaged expert will continue to encourage abattoirs to participate in a stunning trial. In the longer term, there may be more opportunities for stunning to be introduced as the Ministry of Agriculture is now implementing plans to close smaller slaughterhouses and centralise processing. This will be further investigated by the consultant and MLA/LiveCorp.

It is regrettable that with the current difficulties as described above, it has not been possible to implement a stunning trial in 2009/10.

KPI Report

KPI	Activity	Status
Feasibility study completed, locations for stunning trial identified and trial conducted, staff trained in use of stunning equipment.	Feasibility study was conducted and key locations identified as suitable for a trial identified.	Complete
	Stunning trial was not conducted following the feasibility study. No additional funds committed in this area.	Incomplete
Final report details findings of feasibility study and explains how the milestone's activities have improved animal welfare outcomes.	Final report submitted	Complete

Milestone 3 – Independent tour

Activities

Conduct independent tour of south east Asia - in conjunction with the Australian and Indonesian Governments - to gain an independent perspective of animal welfare issues in the region.

KPI

- Team of independent experts in animal production, animal welfare, feedlot management and point of slaughter expertise assembled.
- Team visits facilities in region and inspects and assesses vessel discharge, trucking, feedlot management and point of slaughter.
- Team provides feedback and advice on animal welfare issues in the region including the effectiveness of current animal welfare programs in addressing animal welfare concerns through the supply chain to the point of slaughter.
- Joint report on tour findings to be provided, highlighting areas of improvement required in the region to inform government and industry's approach to improving animal welfare issues associated with the live trade in the region and provide direction for the Australian live export industry in the south east Asian market.

Project outcomes

Tour development and objectives

The independent tour was conducted between 28 February and 9 March 2010. The tour visited facilities in Java and Sumatera covering vessel discharge, trucking, feedlot management and point of slaughter. The full report is attached in Appendix 1.

In order to facilitate the management of the tour, a consultant was contracted to provide a co-ordination role and act as a go between industry and the tour delegates. This was to ensure that independence could be maintained throughout the selection and tour process.

The co-coordinator developed a set of assessment workbooks for the team, coordinated the tour program and travel arrangements, coordinated the team's findings and delivered a final report of the findings of the team.

The project scope required a suitably skilled group of experts who had the appropriate skills in animal production, animal welfare, feedlot management and point of slaughter expertise. The expert panel was selected to ensure a strong mix of practical and theoretical understanding in four areas of expertise required. The group included;

Animal welfare:	Prof Ivan Capel - Honorary (Professor Emeritus), Veterinary Science, University of Melbourne (Team Leader).
Animal production:	Dr Penelope McGowan - Beef Cattle Veterinarian, Brisbane.
Slaughter processes:	Prof Neville Gregory - Professor in Animal Welfare Physiology, Veterinary Clinical Sciences, Royal Veterinary College, University of London.
Feedlot management:	Dr Paul Cusack - Director, Australian Livestock Production Services, Brisbane.
Coordinator:	Peter Schuster - Schuster Consulting

The tour program was developed through consultation with industry, ensuring that the following key activities were conducted and a range of facilities where inspected.

In-market familiarisation and key relationship development

- Meet with the Indonesian Feedlot Association (APFINDO), Animal Welfare Taskforce representative and conduct wet market and supermarket tours.

Discharge and transport

- Observe the unloading of a vessel at an Indonesia port, the use of discharge ramps and the loading of trucks and transportation of cattle.

Feedlot management

- Inspect a range of feedlots covering a mix of enterprise size. Also to inspect short term holding depot operations and intensive breeding operations.

Point of Slaughter

- Inspect all levels of slaughter from traditional slaughter, facilities with industry restraining boxes and modern abattoirs practicing stunning.
- Also to review the industry restraining box program and Standard Operating Procedures (SOP) training outcomes.

The assessment criteria for the facilities were set using the following objectives.

- Appraise in-market compliance with the World Organisation for Animal Health (OIE) Regional Animal Welfare Strategy, Asia, the Far East and Oceania (OIE Strategy) and the OIE Terrestrial Animal Health Code for Transport of Animals by Land and the OIE Terrestrial Animal Health Code for Slaughter of Animals (OIE Code) and other relevant standards, codes, guidelines or requirements.
- Identify any additional animal welfare considerations that may not be included in the OIE Strategy, standards or other guidelines and requirements. Observe the current animal welfare standards in Indonesia from the time of arrival through transport, while on feed and at the point of slaughter.
- Identify operational, commercial, religious and scientific aspects of the transport and treatment of Australian cattle destined for slaughter in Indonesia, as well as any emerging issues relating to animal welfare.
- Wherever possible, observe and record any geographical differences throughout Indonesia in animal welfare standards and practices for Australian cattle.

Conclusions and findings

Overall the tour found that animal welfare in Indonesia was generally good. Incidents of non-compliance with the OIE standards were observed and recommendations have been made to address these. Three critical aspects were identified by the expert panel as significantly influencing animal welfare. These were:

- Animal management; including handling, nutrition and animal suitability
- Slaughter; including facilities and method of slaughter
- Animal welfare standards and their practical application

Findings from the key areas of assessment.

Transport

The transportation of Australian cattle in Indonesia did not present a major animal welfare risk. The majority of the issues identified in the assessment of transport conditions were associated with poor animal handling due to a lack of understanding of animal behavior. Trucks used to transport cattle in Indonesia generally carry a range of cargo and are not purpose built for livestock, this creates potential for welfare issues. Cattle are generally transported short distances from port of entry, to feedlots and then to slaughter. Some cattle are consigned on longer journeys and there is currently little provision for these cattle to be unloaded on route.

Feedlots

Australian cattle observed in feedlots were generally in good condition and comfortable within the environment. Issues associated with infrastructure, nutrition and the handling of livestock were identified in some feedlots and these were considered best addressed through the

provision of technical support to feedlot operators. Poor animal handling due to a lack of understanding of animal behavior was observed in some feedlots. Some of the Australian cattle observed in Indonesia were considered unsuited to the conditions, or were being managed in a way that rendered them unsuitable.

Point of Slaughter

Slaughter was considered to pose the greatest risk to animal welfare. The SOP, in combination with restraining boxes, currently delivers significant animal welfare benefits; however, a review of the SOP to address several issues identified during the assessment would deliver additional benefits. Additional and regular training to encourage the use of SOP in conjunction with restraining boxes would deliver animal welfare benefits. Restraining boxes delivered significant animal welfare benefits, however these require ongoing maintenance to promote their continued use. Several design changes may improve the operation of the restraining boxes and promote additional animal welfare benefits. Stunning was observed to deliver the single biggest animal welfare benefit and the general adoption of stunning in the slaughter of Australian cattle in Indonesia should be an aspirational goal.

Recommendations

Transport

- That driver and handler training be introduced and SOP training extended to address areas such as handler positioning, noise control use of goads and fitness to travel. This training may be augmented through the provision of instructional DVDs.
- Develop guidelines for optimal livestock transport truck crate design and operation including ventilation, non slip flooring, waste disposal, cleaning and disinfecting.
- Encourage the introduction of rest points with unloading facilities for long haul journeys and for use in the case of emergency.

Feedlots

- Technical support - That the program for the delivery of information and technical support to feedlots containing Australian cattle be expanded to emphasise the following issues,
 - Infrastructure – walkways and protrusions, improved gates and laneways, appropriate bedding and management and the implementation of shade for managing heat stress.
 - Nutrition - The importance of including five to 10 cm roughage in a total mixed ration and the use of rumen buffers to minimise the incidence of lactic acidosis.
 - Handling - The importance of maintaining clean cattle and promoting thermoregulatory behaviour in managing heat stress. The importance of grouping animals appropriately, especially with respect to horned and polled animals.
- Training - That handler training be introduced and SOP training extended to address handler positioning (point of balance, flight zone), noise control, the use of goads, unacceptable handling methods, fitness to travel, emergency slaughter. This training should be regular and may be augmented through the provision of instructional DVDs.
- Cattle selection - Encourage, through education and training, the supply of cattle from Australia that are fit for purpose. Cattle observed in market that were considered unfit, or that were being managed in a way that rendered them unfit, included, cattle with less than 50% *Bos indicus* content, horned cattle, cattle with scurs as a result of poor dehorning practices on Australian farms and pregnant heifers supplied when spayed and non-pregnant heifers were ordered.

Slaughter

- SOP - That the existing SOP be reviewed to minimise time spent by cattle in restraining boxes and in recumbency. This may include in box neck rope placement, improved leg restraint and a revision of the washing technique.

- SOP training - That regular slaughter man training be introduced and SOP training extended to address: Principles when casting cattle, Knives (sharpening and type), cutting method – minimising the number of cuts, management of occluded arteries. This training should be regular and may be augmented through the provision of instructional DVDs.
- Pre-slaughter handling – That handler training be conducted on a regular basis and SOP training extended to address: Handler positioning (point of balance, flight zone), noise control, the use of goads, unacceptable handling methods and emergency slaughter. This training should be regular and may be augmented through the provision of instructional DVDs.
- Restraining boxes – That a program for the maintenance, repair and modification of handling facilities in abattoirs with restraining boxes be introduced. This should address: The maintenance of restraining boxes, issues associated with lairage design - particularly lighting, the removal of distractions and impediments to the flow of cattle and the provision of feed, water and, where appropriate, bedding. The Race design should be reviewed where possible to include gates to assist in the emergency removal of animals.
- Restraining box modification – Consider restraining box modifications to: Incorporate rubber matting to act as a buffer and minimise sound when cattle kick out in the boxes and to achieve better head restraint.
- Stunning - Encourage the adoption of stunning in the slaughter of Australian cattle in Indonesia.

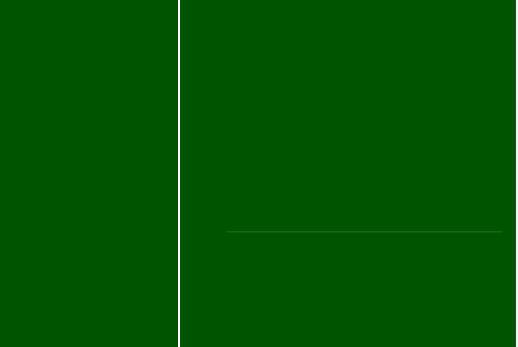
Outcomes

The report has delivered a thorough review of the animal welfare outcomes occurring in Indonesia. The findings have highlighted a number of animal welfare areas that the industry is aware of and in many areas has already implemented programs to address the issues. There is however additional welfare concerns that need to be addressed through the implementation of additional training and extension programs.

KPI	Activity	Status
Team of independent experts in animal production, animal welfare, feedlot management and point of slaughter expertise assembled.	Co-ordinator contracted to facilitate selection and program development.	Complete
Team visits facilities in region and inspects and assesses vessel discharge, trucking, feedlot management and point of slaughter.	Tour conducted from 28 Feb – 9 Mar 2010.	Complete
Team provides feedback and advice on animal welfare issues in the region including the effectiveness of current animal welfare programs in addressing animal welfare concerns through the supply chain to the point of slaughter.	Detailed report completed outlining welfare issues and providing detailed recommendations.	Complete
Joint report on tour findings to be provided, highlighting areas of improvement required in the region to inform government and industry's approach to improving animal welfare issues associated with the live trade in the region and provide direction for the Australian live export industry in the south east Asian market.	Report attached	Complete

Appendix 1

Independent study into animal welfare conditions for cattle in Indonesia from point of arrival from Australia to slaughter



For Public Release

Prepared for:
Meat & Livestock Australia and LiveCorp

Final Report

Independent study into animal welfare conditions for cattle in
Indonesia from point of arrival from Australia to slaughter

May 2010

Executive Summary

Australia and Indonesia have developed a strong bilateral relationship in livestock trade resulting in over 700,000 cattle being exported to Indonesia in 2009. To further build on this relationship and contribute to the long-term sustainability of the trade, an independent expert review of the animal welfare conditions for Australian cattle in Indonesia was commissioned by Meat & Livestock Australia and LiveCorp.

The study took into account the World Organisation for Animal Health (OIE) Regional Animal Welfare Strategy, Asia, the Far East and Oceania and the OIE Terrestrial Animal Health Code for Transport of Animals by Land and Slaughter of Animals (OIE Code) along with work conducted by the Department of Agriculture, Fisheries and Forestry, LiveCorp and Meat & Livestock Australia.

Qualitative research was undertaken through in-market observation and interviews with key importers, feedlot operators and other supply chain participants involved with imported Australian cattle from the point of arrival in Indonesia to slaughter. Six feedlots were visited and the slaughter of 29 cattle was observed at 11 abattoirs.

The trade in Australian cattle in Indonesia was found to be transparent and the tour group received unfettered access to facilities and staff.

Animal welfare was generally good. Occasional incidents of non-compliance with the OIE Code were observed and recommendations to address these issues are made through this report. Australian cattle in Indonesia were generally found to be coping well with the conditions to which they were exposed.

Three critical aspects were identified by the expert panel as significantly influencing animal welfare. These were:

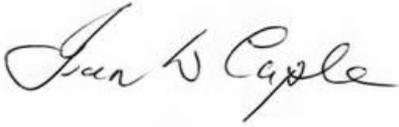
- Animal management; including handling, nutrition and animal suitability
- Slaughter; including facilities and method of slaughter
- Animal welfare standards and their practical application

Of the recommendations made through this report, encouraging the use of non-lethal stunning during slaughter and developing an increased appreciation of the animal welfare and production benefits gained by importing cattle suited to the conditions were considered foremost.

The animal welfare issues encountered through the study were generally considered best addressed by extending or modifying programs currently being undertaken by Meat & Livestock Australia and LiveCorp with the support of the Australian and Indonesian governments.

Commendation

We, the undersigned, support this report as a fair and reasonable account of the animal welfare conditions for cattle in Indonesia from point of arrival from Australia to slaughter in Indonesia based on the observations made in-market 1-9 March 2010 and support the recommendations made through this report.



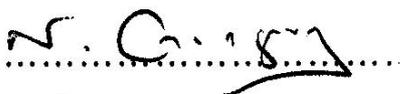
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1 Background

Australia and Indonesia have developed a strong bilateral relationship in livestock trade that has resulted in important commercial partnerships between industries in both countries. To further build on this relationship and contribute to the long-term sustainability of the trade, an independent expert review of the animal welfare conditions for Australian cattle in Indonesia was undertaken in March 2010.

An independent consultancy was contracted to coordinate the study, including the recruitment of a panel of independent subject matter experts.

The objective of the study was to identify areas for improvement in animal welfare standards in Indonesia based on the post arrival arrangements of cattle for slaughter and provide recommendations to address these issues.

The study took into account the World Organisation for Animal Health (OIE) Regional Animal Welfare Strategy, Asia, the Far East and Oceania¹ (OIE Strategy) and the OIE Terrestrial Animal Health Code for Transport of Animals by Land² and Slaughter of Animals³ (OIE Code) along with work conducted by the Department of Agriculture, Fisheries and Forestry (DAFF), LiveCorp and Meat & Livestock Australia (MLA).

The following definition of animal welfare, as defined in Article 7.1.1 of the OIE Code, has guided this assessment:

"Animal welfare means how an animal is coping with the conditions in which it lives. An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear, and distress. Good animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter/killing. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment."

¹ (2008), OIE Regional Animal Welfare Strategy, Asia, the Far East and Oceania

² (2009) Section 7 (Animal Welfare), Chapter 7.3 (Transport of Animals by Land), OIE Terrestrial Animal Health Code, 18th Edition

³ (2009) Section 7 (Animal Welfare), Chapter 7.5 (Slaughter of Animals), OIE Terrestrial Animal Health Code, 18th Edition

2 Objectives

The expert panel sought to satisfy the following objectives:

- Appraise in-market compliance with the OIE Strategy, the OIE Code for animal welfare standards for 'Transport of Animals by Land' and 'Slaughter of Animals' and other relevant standards, codes, guidelines or requirements.
- Identify any additional animal welfare considerations that may not be included in the OIE Strategy, OIE Code or other guidelines and requirements.
- Observe the current animal welfare standards in Indonesia from the time of arrival through transport, while on feed and at the point of slaughter.
- Identify operational, commercial, religious and scientific aspects of the transport and treatment of Australian cattle destined for slaughter in Indonesia, as well as any emerging issues relating to animal welfare.
- Observe and record any geographical differences throughout Indonesia in animal welfare standards and practices for Australian cattle.

3 Methodology

The study was based on qualitative research through in-market observation and interviews with key importers, feedlot operators and other supply chain participants involved with imported Australian cattle from the point of arrival in Indonesia to slaughter.

3.1 Independent panel

An independent private consultancy was engaged to recruit an expert panel to travel to Indonesia and undertake the in-market assessment. The panel members were selected on the basis that they were independent and demonstrated expertise in one of four particular areas identified as being central to the study. The four areas of expertise required for the study were:

- Animal welfare
- Animal production
- Slaughter processes
- Feedlot management

The professional opinion of various organisations, including the Australian Veterinary Association and the Australian Lot Feeders Association, was sought in compiling an initial list of candidates which was then refined according to independence and experience.

Biographies for the four individuals are included in Appendix 1.

3.2 Schedule and areas of assessment

The schedule for the study, including facilities to be assessed, was drafted prior to the study's commencement. The facilities were selected to demonstrate the full range of operations in Indonesia, from traditional feeding methods and slaughter through to highly sophisticated, large scale feedlots and abattoirs.

Flexibility was, however, retained within the schedule to allow other facilities and processes to be observed as required by the panel. This occurred on several occasions and assisted the participants in gaining a comprehensive appreciation of the conditions experienced by Australian cattle in Indonesia.

The schedule included a brief one-day introduction and market familiarisation followed by a seven-day assessment tour.

The introduction and market familiarisation was included to provide context to the study and involved:

- Meetings with Asosiasi Pengusaha Feedlot Indonesia (APFINDO - feedlotters association) – pre and post tour.
- A meeting with a representative from the Animal Welfare Taskforce. The Animal Welfare Taskforce is made up of representatives from Meat & Livestock Australia, LiveCorp and APFINDO.
- Wet or fresh market tours.

The areas assessed during the seven-day study component included:

- Feedlot management and animal handling
 - Assessment of six feedlots of varying sophistication ranging from advanced, large scale operations through to holding depots and intensive breeding operations.
- Slaughter processes and animal handling
 - Assessment of 11 slaughter facilities and the slaughter of 29 cattle. Facilities ranged from modern abattoirs using stunning through to traditional slaughterhouses with and without industry improvements.

- Restraining boxes
 - Locations that use restraining boxes in Jakarta and Bandung, Java and Lampung, Sumatra.
 - A total of 15 industry funded restraining boxes and six improvised “copy” boxes were observed. The industry funded boxes were branded with “Meat & Livestock Australia / Livecorp / APFINDO”, representing the funding partners. “Copy boxes” are privately funded replicas of the industry funded restraining boxes, they were observed in several abattoirs reportedly practicing traditional slaughter.
- Transport
 - Transport and transport facilities were assessed wherever possible at feedlots.
 - The study included the observation of the unloading of a sample from about 2,900 Australian cattle, loaded in Darwin and discharged at Lampung Port.

3.3 Approach

An objective approach to the in-market assessment was adopted wherever possible and encouraged through the use of a workbook based on the OIE Code. Each panel member was required to record observations according to their field of expertise. These observations were consolidated at the end of each day during a debriefing session during which issues of particular importance were noted.

The collection of detailed quantitative data was beyond the scope of this study.

3.3.1 OIE Terrestrial Animal Health Code

The workbook, adapted from the OIE Code, included detailed worksheets for each facility. These worksheets encouraged the observation of particular infrastructure and handling practices identified within the OIE Code and required that these be scored and prioritised by the panel according to their impact on animal welfare.

The procedures and practices observed specifically in relation to the OIE Code can be grouped as follows:

- **Transportation**

- Handling of livestock
 - Loading and unloading procedures
 - Overall handling (goads, dogs, lifting or painful handling etc)
 - Selection of livestock groups for transit
 - Fitness for travel, handler checks etc
 - Handler skill, experience and training
 - Behaviour of livestock (stress, aggression etc)
 - Veterinary assistance and humane disposal (if required)
 - Appropriate quarantine and disease control throughout journey
- Journey management
 - Appropriate journey planning, overall management and administration
 - Duration of journey and unnecessary prolonged delays
 - Facilities provided in transport (feed, water, protection, bedding, ventilation)
- Facilities and equipment
 - Exposure to sights, smells or surfaces that may harm or stress livestock
 - Overall construction (size, ventilation, safety, lighting etc)
 - Cleaning and disinfecting procedures and facilities

- **Point of slaughter**

- Handling of livestock
 - Loading and unloading procedures
 - Overall handling (goads, dogs, lifting or painful handling etc)
 - Handler skill, experience and training
 - Grouping of livestock at slaughterhouse
 - Behaviour of livestock (stress, aggression etc)
 - Veterinary assistance and humane disposal (if required)
 - Appropriate quarantine and disease control
- Facilities and equipment
 - Exposure to sights, smells or surfaces that may harm or stress livestock
 - Overall lairage construction (size, ventilation, safety, lighting etc)
 - Facilities provided (feed, water, protection, bedding, ventilation, cleanliness)
 - Cleaning and disinfecting procedures and facilities
- Slaughter processes
 - Presentation of animal for slaughter
 - Method and use of restraints for stunning or slaughter without stunning
 - Method of stunning (where used: captive bolt, electrical head-only)
 - Time between restraint, stunning and bleeding (>20 seconds for stun-stick)
 - Prevalence of stunning failure and actions taken
 - Accurate, prompt and effective cutting for bleeding
 - Halal slaughter processes

A specific OIE Code relating to feedlots does not exist. As feedlots play an important role in the supply of Australian cattle for slaughter in Indonesia, articles contained within the OIE Codes that could be applied to feedlots, particularly those relating to lairage and handling, were identified and the panel was required to assess the feedlots against these through relevant worksheets.

Feedlots also provided a useful reference point for the commencement and termination of transport.

3.3.2 Cultural, religious, economic and geographic influences

The panel was required to consider additional factors that may impact animal welfare and the application of the OIE Code. These additional considerations have been grouped as cultural, religious, economic and geographic influences.

4 Market background

The following information was related to the panel by supply chain participants within Indonesia. While it was not considered that this necessarily accurately reflected the actual market, the following observations did provide context to the trade.

The supply of Australian cattle to market in Indonesia typically occurs as follows:

- Cattle, preferably steers but when these are unavailable or too expensive, spayed heifers and bulls, are supplied as either slaughter cattle or feeder cattle from Australia. Slaughter cattle tend to weigh 400-450 kg while feeder cattle are imported at about 300 kg live weight and then, following trucking to feedlots where they are quarantined for 14 days, fed for an average of 90 days.
- Cattle that have been fed for the desired period are trucked from feedlots to slaughter at a live weight observed to be around 430 kg. Slaughter typically occurs at private or government abattoirs and takes place between about 2200 hours and 0300 hours.
- The slaughtered animal is cut into primals or large joints immediately and the meat transported to market or manufacturing facilities in unrefrigerated vehicles. About 60% of beef is sold through wet markets and 40% directly to "bakso" meatball manufacturers. Reportedly 70% of all beef is manufactured into bakso balls, suggesting that a proportion of wet market sales are also directed toward bakso ball manufacture.
- Meat is generally consumed or manufactured within 24 hours of slaughter.

The availability of cheap labour in Indonesia was observed to influence the design of facilities and the way Australian cattle were handled in market. Processes were typically labour intensive.

5 Findings

5.1 Transport

The trade in Australian cattle in Indonesia was found to be transparent and the tour group received unfettered access to facilities and staff. Transport operators and those workers responsible for dispatch and receipt at abattoirs and feedlots were welcoming, cooperative and generally unperturbed by the panel's presence. This was found to be the case regardless of whether the visit was prearranged or impromptu.

5.1.1 General observations

The following in-market observations do not relate directly to the OIE Code but were considered to be important in providing context.

5.1.1.1 Vehicles

The transportation of Australian cattle in Indonesia was undertaken using trucks and, if required, a ferry between Sumatra and Java. Cattle reportedly remained on the truck during ferry transport which occurred by roll-on, roll-off arrangement, although this was not directly observed.

Trucks are generally small and registered to carry 3.5 to 10 tonne. Loaded trucks were observed to carry between 5 and 19 head depending on the size of the truck and cattle. Larger trucks were reportedly used on occasion to transport cattle long distances (Lampung to Medan) although these were not observed.

Land transport and the size of the trucks were constrained by the condition of the roads. Roads were observed to be narrow, congested and in need of maintenance. One rural journey of 300 km in the Lampung area was reported to take 11 hours.

Most transport was undertaken using professional trucking companies with only a few feedlots owning their own trucks.

Trucks and crates were generally not livestock-specific but rather carried a range of consignments.

5.1.1.2 Handling

Truck drivers were reportedly responsible and financially liable for the cattle they were transporting. If a beast was injured or died in transit, or was rejected by the receiver, the truck driver may be liable for the cost of that animal. This may result in the loss of one to three months wages as it was rare for drivers or their employers to carry insurance.

As a direct consequence of this liability, a high standard of cattle care was maintained during loading, unloading and trucking with drivers reportedly routinely refusing to transport unfit cattle. While this could not be verified and such intervention not observed (all transported cattle were fit to load), the welfare of cattle transported in Indonesia was generally good.

5.1.1.3 Welfare

Animal handler competency was considered to be the greatest factor potentially impacting animal welfare during transport due to the number of individuals involved in the transport process and the lack of operating guidelines and enforceable standards.

5.1.2 Review against the OIE Code

The transportation of Australian cattle from the time they arrived in Indonesia until the point of slaughter was, wherever possible, assessed against the OIE Code. While this did not include travelling with the livestock, cattle were observed being unloaded onto trucks at the point of arrival at Lampung Port, loaded onto trucks at feedlots and while on trucks. Loading and unloading facilities as well as trucks were inspected at Lampung Port, feedlots and slaughter houses. Drivers and facility operators were interviewed regarding the process.

Measurable aspects of the OIE Code have been interpreted and extrapolated to allow performance against the OIE Code to be reviewed.

5.1.2.1 Handling of livestock

Observations of the handling of livestock during transport against the OIE Code:

- **Loading and unloading procedures**
 - Informal procedures were in place and, in most cases, practiced daily to govern the loading and unloading of cattle. The regularity of loading and unloading helped ensure efficiency and functionality.
- **Overall handling (goads, dogs, lifting or painful handling etc)**

- The handling of livestock during transport was generally observed to be good. Goads and dogs were not observed to be used during transport although a goad (electric cattle prod) was seen on the dashboard of one truck.
- **Groupings of livestock and selection**
 - The livestock that were observed were grouped appropriately.
- **Fitness for travel, handler checks etc**
 - Cattle were reportedly scrutinised by the driver for fitness to travel and it was said to be common practice for drivers to refuse to carry livestock that were not deemed to be fit for travel.
 - The truck driver would reportedly be penalised for any cattle that did not arrive safely at their destination and they would therefore refuse to load unfit animals. A formal assessment of fitness to travel was not undertaken nor an enforceable standard observed.
- **Handler skill, experience and training**
 - Handlers were observed to load trucks efficiently and effectively. Training was typically on the job and not formalised. Excessive noise and inappropriate placement of surplus people was observed on several occasions indicating the need for additional training.
- **Behaviour of livestock (stress, aggression etc)**
 - The cattle that were observed on trucks and immediately following transport were calm and in good condition with the exception of one animal which had suffered an injury during transport. This was attributed to the condition of the road leading to the abattoir.
- **Veterinary assistance and humane disposal (if required)**
 - Veterinary assistance was available upon arrival at feedlots but generally not at abattoirs. Provision for the discharge and humane disposal of livestock during transport was limited.
- **Appropriate quarantine and disease control throughout journey**

- Cattle from Australia were required to be quarantined upon arrival at feedlots for 14 days. Cattle were maintained as a consignment throughout transport and not grouped with other animals minimising the potential for disease transmission.

5.1.2.2 Journey management

Observations relating to journey management against the OIE Code:

- **Appropriate journey planning, overall management and administration**
 - Cattle were accompanied by a health certificate and order form in transit.
 - There was little evidence of formal journey planning. During extended transportation over several days, feed and water were reportedly made available on the trucks but cattle were not offloaded.
 - Cattle were not necessarily trucked during cooler times of the day.
- **Duration of journey and unnecessary prolonged delays**
 - Most journeys were of a short distance.
 - Some journeys took up to three days and there was some evidence of more detailed journey planning, including the provision of feed and water during extended transportation.
 - Prolonged delays were possible due to the condition of roads and, in some cases, the need to cross the Selat Sunda between Sumatra and Java by ferry. There was little evidence of contingency or emergency planning.
 - Discussion with one truck driver revealed that a journey of 300 km typically took 11 hours.
 - Facilities were not available for cattle to be unloaded and rested during transport.

- **Facilities provided in transport (feed, water, protection, bedding, ventilation)**
 - Bedding was provided in all observed trucks. This generally consisted of 15-20 cm of organic material such as rice hulls or saw dust. Some companies enforced a minimum standard with trucks turned away if ill equipped.
 - There were no obvious facilities for the delivery of feed and water although this was reportedly provided by buckets being lowered into the crates.
 - Animals were protected from escape through the installation of bars covering transport crates.
 - Crates were generally solid walled with open tops providing some ventilation. Additional vents were observed in some but not all crates.

5.1.2.3 Facilities and equipment

Observations relating to the facilities and equipment used during transport against the OIE Code:

- **Exposure to sights, smells or surfaces that may harm or stress livestock**
 - Bedding was used in all observed trucks.
 - Some truck crate flooring was of a nonslip construction; however, this was not standard as most trucks were multipurpose.
 - Crates were generally of solid wall design which minimised visual stimulation.
- **Overall construction (size, ventilation, safety, lighting etc)**
 - Loading and unloading facilities were observed to be purpose built and fit for purpose.
 - In a minority of cases, stock security was considered to be a potential issue due to the absence of side gates on the loading ramp; however, at the facilities where loading and unloading was taking place, this did not appear to present a problem.
 - Loading and unloading ramps were generally well designed to allow uninterrupted passage between the facilities and the trucks.

- Where vents were not provided, solid wall crate design limited ventilation although the crates were single deck and not covered. Holes had been cut in the sides of some crates to provide additional ventilation.
 - The size, nature and construction of the trucks was generally observed to be fit for purpose and suited to the conditions.
 - Most trucks were equipped with ladders to allow cattle to be observed from above. Others had windows from the cabin into the crate to facilitate observation in transit.
- **Cleaning and disinfecting procedures and facilities**
 - Although the cleaning and disinfecting of trucks was not observed, trucks were generally clean, well maintained and supplied with fresh bedding. The routine cleaning of trucks was reported at one feedlot that owned its own fleet of cattle transport trucks.

5.1.3 Additional considerations

Operational, commercial, religious, geographic and scientific aspects of the transport and treatment of Australian cattle for slaughter were observed, where possible, from the time of arrival in Indonesia by sea, through transportation to the feedlot, depot or breeding facility and then on to the slaughterhouse and through to slaughter. Areas for possible practice improvement that may promote an improved animal welfare outcome were identified. The observations recorded below relate to transport and represent a consensus opinion of the independent expert panel. Where warranted, the possible improvements have been addressed through the specific recommendations made in section 7: Recommendations and indexed below.

	Issue	Possible improvement	Recommendation
Operational	<ul style="list-style-type: none"> Excessive numbers of handlers were observed during loading for transport at Lampung Port and at several feedlots. These people were often poorly positioned and interfered with the loading, unloading process. 	<ul style="list-style-type: none"> Driver and animal handler training. 	7.1.1
	<ul style="list-style-type: none"> Congested traffic and poor road condition. 	<ul style="list-style-type: none"> Improved, formal journey planning to minimise the risk. 	7.1.3 7.4.1
	<ul style="list-style-type: none"> Commercial trucking companies were used in most situations. Different trucks and truck drivers may be used on each occasion when cattle need to be transported making driver animal handling and vehicle improvement difficult. 	<ul style="list-style-type: none"> Make general training material readily available to trucking companies, possibly through DVDs. Engage with trucking companies to investigate ways that improvements such as improved ventilation and non-slip flooring may be adopted. 	7.1.1 7.1.2

Operational continued	<ul style="list-style-type: none"> Contingency and emergency plans were not obvious 	<ul style="list-style-type: none"> Formalise the process of contingency planning 	7.1.3 7.4.1
	<ul style="list-style-type: none"> Provision of feed and water during long haul transport 	<ul style="list-style-type: none"> Further assess conditions during extended transport to assess the effectiveness of the current system for providing feed and water as well as the need for offloading facilities. 	7.1.1 7.1.3 7.4.1
	<ul style="list-style-type: none"> Unloading and transport from wharves may be problematic if sufficient trucks were not available. Trucks were booked and supplied by the importer; generally the destination feedlot. 	<ul style="list-style-type: none"> Centralised coordination of trucking from wharves. 	7.4.1
	<ul style="list-style-type: none"> Excessive numbers of people present during animal handling. 	<ul style="list-style-type: none"> Conduct training to impress upon handlers the importance of minimising stress by limiting human interaction with the cattle. This training may be augmented through the production and distribution of training DVDs. 	7.1.1
Commercial	<ul style="list-style-type: none"> Animal welfare is currently underpinned by an informal arrangement whereby the truck driver is responsible for the safe delivery of the animal and liable for loss or injury. While this system appears to be effective, the arrangement appeared to be informal and does not necessarily clearly assign responsibility. 	<ul style="list-style-type: none"> Formalise the chain of responsibility during transport. 	7.1.1 7.1.2
Religious	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	

<p>Geographic</p>	<ul style="list-style-type: none"> • Access in some areas was limited to poorly maintained, steep roads. This was observed in one instance to cause serious injury. 	<ul style="list-style-type: none"> • Non-slip flooring on trucks. • Truck driver training to minimise the risk of injury when trafficking such roads. • Ensuring that sufficient bedding is in place to minimise injury in the event that an animal falls. 	<p>7.1.1 7.4.1 7.1.2</p>
<p>Scientific</p>	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	

Table 1: Operational, commercial, religious, geographic and scientific observations - Transport

5.1.4 Summary

While the transportation of Australian cattle in Indonesia did not present a major animal welfare risk, several areas for improvement were identified and have been addressed in the recommendations. These included:

- **Training**

The majority of the issues identified in the assessment of transport conditions were associated with poor animal handling due to a lack of understanding of animal behaviour. Animal handlers throughout the transport process would benefit from animal handler training.

- **Truck crate design and operation**

Trucks used to transport cattle in Indonesia generally carry a range of cargo and are not purpose built for livestock. Animal welfare benefits would be realised by introducing operation and design guidelines for trucks carrying Australian cattle.

- **Rest points**

Cattle are generally transported short distances from port of entry, to feedlots and then to slaughter. Some cattle are consigned on longer journeys and there is currently little provision for these cattle to be unloaded on route. The introduction of rest points where cattle may be unloaded, fed, watered and rested would assist in the transport of cattle over long distances.

5.2 Feedlots

The trade in Australian cattle in Indonesia was found to be transparent and the tour group received unfettered access to facilities and staff. Feedlot operators and workers were generally welcoming, cooperative and unperturbed by the panel's presence. This was found to be the case at facilities, regardless of whether the visit was prearranged or impromptu.

5.2.1 General observations

The following in-market observations do not relate directly to the OIE Code but were considered to be important in providing context.

5.2.1.1 Overview

During the study, six feedlots (three in West Java and three in Lampung province in Sumatra) were visited which, at the time, held approximately 99,100 imported Australian cattle. These feedlots were typically free of offensive smells and animal noise which, according to the panel, suggested a good standard of animal welfare.

The presence or otherwise of offensive smells and animal noise was used as an indicator of animal welfare by the expert panel at each facility with offensive smells and excessive noise suggesting underlying animal welfare issues.

Cattle were often observed to be chewing their cud, behaviour which indicates rumination and contentment.

5.2.1.2 Feedlot size and cattle population

Feedlot size ranged from 1,300 head to around 30,000 head. Larger feedlots discharged about 150 to 200 head to abattoirs per night, mainly in trucks carrying around six head. Discharge increased to up to 900 per day from larger feedlots during religious festivals.

Local cattle supply to feedlots was reported to be declining with 98% of feedlot cattle now imported. Local cattle tended to be of a smaller type with less pronounced muscling than the imported cattle and this was considered to be due to a combination of genetic makeup and management.

5.2.1.3 Quarantine and induction

Australian cattle, upon arrival at a feedlot in Indonesia, are required to be quarantined for 14 days. The quarantine process is managed by government vets and feedlot staff.

Handling was typically minimised in the first five days to allow the cattle to settle and bedding was usually provided to maximise the opportunity for rest. As part of the induction process, cattle were typically vaccinated for Haemorrhagic septicaemia (HS).

5.2.1.4 Feed

The majority (95%) of feedstuffs used in feedlots are sourced locally and milled on site. Products used in ration mixes include palm kernel extract (PKE), soya meal, cassava and ongak (tapioca by-products), rice bran, pineapple by-products, rice straw, king grass, coca skins, soya meal, wheat bran and molasses.

Roughage of a desirable length, five to ten centimetres, fed as part of a total mixed ration (TMR) was only observed at two of the six feedlots visited. Roughage was not included as part of a TMR in the majority of feedlots due to a lack of milling infrastructure to deliver such a ration. Rice straw was observed to be fed at two feedlots; however, some of this was of poor quality and affected by mould.

Training and advice had been provided to several feedlots by MLA, LiveCorp and APFINDO, particularly relating to nutrition, and this was referenced by several operators. Aspects of this advice had been adopted; however, the extent to which this had been followed was limited by the feedlot infrastructure (milling) and the level of understanding of the handlers.

Average daily weight gain for Australian steers in Indonesian feedlots was about 1.2 kg/day with the poorest gain being about 1 kg/day and the best being 1.8 kg/day.

Cattle were fed for an average of 60 to 90 days. The maximum time on feed was reported to be 150 days. Fat was trimmed and disposed of during dressing and, as such, feeding was not designed to deliver fat cover equivalent to that sought in Australian feedlots. Similarly, dressing percentages were lower, typically 52%, as the carcass weight did not include the trimmed fat.

5.2.1.5 Health

All feedlots engaged a veterinarian who trained staff in the day-to-day inspection of livestock. Minor issues would be attended to by the handlers and referred to the veterinarian as required.

Mortalities were reported to average 0.1% and morbidity 5% in Indonesian feedlots although effective data capture and reporting systems to corroborate these figures were not observed.

The animal health issues observed in the hospital pens and on occasion in the general population were associated with physical injury, lameness, laminitis and respiratory illness.

Lactic acidosis was identified as an important disease issue by the staff at two feedlots. While the consistency of the faeces observed at all feedlots was not indicative of clinical rumen acidosis, there was evidence of laminitis, an indicator of lactic acidosis particularly in *Bos indicus* cattle, at three of the feedlots.

Isolated incidents of coughing were recorded at one of the six feedlots with 20-35 coughs per minute (from different cattle) observed. Coughing can be indicative of respiratory irritation and may have been due to Bovine Respiratory Disease although this could not be verified.

Isolated incidents (one or two animals in a pen of 30-40 animals) of rapid breathing, averaging 150 breaths per minute and up to 180 breaths per minute, were observed within the general livestock population at four of the six feedlots. Such animals were typically in unshaded areas of the pen.

Mortalities were generally disposed of onsite and usually buried. In one instance, in the event of mortality, the feedlot operators would open the carcass and douse with diesel to deter disinterment for human consumption.

5.2.1.6 Heifers

Spayed and non-pregnant heifers were imported to be fed for 60 to 120 days and then slaughtered. Although steers were preferred by the trade, heifers were purchased when steers were considered too dear or unavailable.

An unacceptable percentage of pregnant heifers (reportedly about 0.1% but as high as 8%; however, these figures could not be verified) were reported by feedlot management to be included in these consignments resulting in potential animal welfare and trade issues. These heifers were, when identified prior to slaughter, observed to be retained with the calves grown out and weaned before the cows were slaughtered.

5.2.1.7 Horned cattle

Despite there being no evidence of dominance behaviour, such as abrasions from horn-raking in the chest and abdominal regions, horned cattle were penned at densities that were considered to be too high at five of the six feedlots.

5.2.1.8 Construction

The general construction of feedlots incorporated concrete flooring, feed bunkers and water troughs. A good ad lib supply of clean water was observed at all feedlots although some troughs were observed to be predisposed to faecal contamination.

5.2.1.9 Stock density

The average stock density was 2.5-3 m²/hd. This was generally consistent with the stocking density recommended in the MLA *Manual for South-East Asian cattle feedlots*; 2.5-4 m²/hd for fully covered pens and 5-9 m²/hd for partially covered pens.

The stocking density in some pens at two of the six feedlots was estimated to be 2 m²/hd. This was considered to be too high for the conditions. Although widespread heat stress was not observed, this density was considered high enough to potentially contribute to heat load by not providing individual animals with sufficient space to disperse heat.

5.2.1.10 Bedding

The roof cover at one feedlot where bedding was provided but not replaced regularly afforded inadequate protection from rain. This resulted in unacceptably boggy conditions in several pens; however, these had been destocked due to the conditions.

5.2.1.11 Welfare

Financial incentives for feedlot operators ensure the maintenance of a high standard of cattle care. Feedlot operators generally appreciated the correlation between content, well cared for cattle and increased weight gain.

Heat load was considered to be the greatest factor potentially impacting animal welfare in the feedlot environment, especially for *Bos taurus* cattle.

5.2.2 Review against the OIE Code

The conditions experienced by Australian cattle in feedlots in Indonesia were, wherever possible, assessed against the OIE Code. As a specific OIE Code does not exist for feedlots, applicable components of the OIE Code for Transport of Animals by Land and Slaughter of Animals formed the basis of the review.

Measurable aspects of the OIE Code were identified to allow performance against the OIE Code to be reviewed. These have been broadly categorised and summarised under the headings below.

5.2.2.1 Handling of livestock

Observations of the handling of livestock in feedlots against relevant articles of the OIE Code:

- **Loading and unloading procedures**
 - While the receipt of livestock at feedlots was not directly observed, procedures described by the operators and the infrastructure indicated that this most likely happens in an orderly and efficient manner.
 - Discharge from feedlots was observed to occur in an efficient fashion. Principal handlers were experienced and were assisted by additional staff gaining on-the-job training.
- **Overall handling (goads, dogs, lifting or painful handling etc)**
 - The use of dogs and goads was not observed although several electric goads were observed on site. Sticks were used but in a controlled fashion.
- **Handler skill, experience and training**
 - Each facility was observed to have at least one experienced handler who was providing informal on-the-job training for other staff.
 - One operated a three-month internship after which the intern would be employed or released. Other feedlots provided informal on-the-job training.
- **Groupings of livestock**
 - Livestock were at times inappropriately grouped. Horned cattle (horns trimmed) were often grouped with unhorned animals.
 - Bulls were observed to occasionally be penned with steers and with or beside heifers (usually spayed).
 - Social groups were maintained within the feedlot.
- **Behaviour of livestock (stress, aggression etc)**
 - Cattle were generally observed to be contented; ruminating and at ease.

- Excessive teeth grinding was observed in one area of one feedlot and this was considered to be a transient dietary issue.
- Isolated incidents of panting and coughing were observed indicating respiratory irritation and heat stress.
- **Veterinary assistance and humane disposal (if required)**
 - Veterinary assistance was available at all feedlots.
 - The occasional need for humane disposal was understood although it is thought that, on occasion, cattle that are sick or injured and would normally be considered unfit to load are transported to point of slaughter so that some economic return can be salvaged.
- **Appropriate quarantine and disease control**
 - Upon arrival at the feedlots, cattle are required to be quarantined in separate facilities for 14 days.
 - For the duration of time on-feed, handlers monitor the pens several times a day to identify sick animals. These were removed from the general population on an ongoing basis and treated in sick pens.
 - The approach to treatment record keeping varied among feedlots and was considered unsatisfactory in four of the six feedlots visited. This was not, however, observed to affect or necessarily impact animal welfare.

5.2.2.2 Facilities and equipment

Observations relating to the facilities and equipment in feedlots against relevant articles of the OIE Code:

- **Exposure to sights, smells or surfaces that may harm or stress livestock**
 - Feedlots were generally calm, quiet and free from offensive odours.
- **Overall lairage construction (size, ventilation, safety, lighting etc)**
 - Yards and loading ramps were generally well designed and maintained. While these did not always comply with the OIE Code, they were considered fit for purpose.

- Several minor infrastructure issues were identified at each of the six feedlots. These were generally associated with distractions, protrusions and uneven surfaces in walkways.
- The only significant design flaw observed at all feedlots was the absence of gates along races to allow the emergency release of cattle.
- **Facilities provided (feed, water, protection, bedding, ventilation, cleanliness)**
 - Feedlots were generally well constructed with suitable infrastructure for the ample provision of feed and water. Some dietary issues were encountered and these were linked to a lack of appropriate dietary roughage (50-100 mm in length). In these circumstances, the feedlot feed mills were reportedly incapable of processing the ration to include long roughage.
 - Shade was generally adequate although conditions in some feedlots could be improved significantly by extending shade to cover a larger proportion of the pens.
 - Cleanliness was compromised at one feedlot where the infrequent cleaning of pens and replacement of bedding resulted in waste accumulation.
 - Ventilation was adequate in all feedlots.
- **Cleaning and disinfecting procedures and facilities**
 - Most feedlots were kept clean through the regular removal of waste, changing of bedding or hosing of pens and cattle. One exception was observed where bedding was changed infrequently and waste allowed to accumulate. The accumulation of faeces under these circumstances would result in a high prevalence of bacteria and increased disease risk.

5.2.3 Additional considerations

Operational, commercial, religious, geographic and scientific aspects of the transport and treatment of Australian cattle for slaughter were observed where possible from the time of arrival in Indonesia by sea, through transportation to the feedlot, depot or breeding facility and then on to the slaughterhouse and through to slaughter. Areas for possible practice improvement that may promote an improved animal welfare outcome were identified. The observations recorded below relate to feedlot operation and represent a consensus opinion of the independent expert panel. Where warranted, the possible improvements have been addressed through the specific recommendations made in section 7: Recommendations, and indexed below.

	Issue	Possible improvement	Recommendation
Operational	<ul style="list-style-type: none"> The capacity of several feedlots to feed adequate roughage (five to ten centimetres in length) as part of a total mixed ration was limited. In such cases, roughage was generally fed following a concentrate feed mix. This is likely to have adversely affected rumen function and average daily gain and may have contributed to acidosis. This contention is supported by the presence of clumping and branching of rumen papillae observed in post mortem studies at abattoirs. 	<ul style="list-style-type: none"> Training is required to educate feed mill and feedlot operators of the production benefits gained through the provision of adequate roughage. Investment in feed milling equipment to enhance capability. 	7.2.1

Operational continued	<ul style="list-style-type: none"> Heat load was observed to be the most significant issue confronting feedlots. This was managed in a number of ways including through the provision of shade and water, the hosing of animals to promote cooling (the ability of soiled <i>Bos indicus</i> cattle to thermoregulate is compromised by the accumulation of dirt and faeces on the skin) and the regulation of numbers of cattle in pens to allow enough space for heat dissipation. Despite an appreciation of the issue, some feedlots were struggling to manage heat load. 	<ul style="list-style-type: none"> Education of the average daily gain benefits and reduction in morbidity delivered by managing heat load. Increase in shade. Education regarding appropriate densities for different types of cattle under different circumstances. Hosing where cattle are kept on concrete floors without bedding. Training that emphasises the commercial advantages associated with importing appropriate cattle (at least 50% <i>Bos indicus</i>). 	<p>7.2.2 7.2.1</p>
	<ul style="list-style-type: none"> Bedding was supplied at one feedlot but not replaced often enough to prevent the accumulation of an unacceptable amount of waste. Cattle were very dirty and the accumulation of mud and faeces on the skin interfered with their ability to thermoregulate and thus contributed to heat load. Cattle were labouring to walk through the accumulated waste and their ability to control their movement was impaired. 	<ul style="list-style-type: none"> Training that emphasises the commercial advantages via increased weight gain associated with clean pens (increased ability to dissipate heat and less effort required to move around pens). 	<p>7.2.2 7.2.1</p>

Operational continued	<ul style="list-style-type: none"> Horned cattle were often boxed with unhorned cattle. 	<ul style="list-style-type: none"> Training of feedlot operators regarding the production losses associated with dominance behaviour commonly expressed when horned and unhorned cattle are mixed. Education regarding appropriate densities for different types of cattle under different circumstances. 	7.2.2 7.2.1
	<ul style="list-style-type: none"> Excessive numbers of people present during animal handling. 	<ul style="list-style-type: none"> Conduct training to impress upon handlers the importance of minimising stress by limiting human interaction with cattle during the early feedlot period (three to five days). Train handlers regarding flight zone and point of balance. 	7.2.2
	<ul style="list-style-type: none"> There was a wide variance in the level of capability in animal handling. There was also a cultural divergence as to what constituted animal welfare and stress. 	<ul style="list-style-type: none"> Implement animal handler training augmented by readily accessible tools such as a DVD showing best practice animal handling techniques. 	7.2.2
Commercial	<ul style="list-style-type: none"> <i>Bos taurus</i> cattle were prevalent in some feedlots and were obviously affected by the heat load. The purchase of these cattle in preference to <i>Bos indicus</i> was based on price and availability. 	<ul style="list-style-type: none"> Review the appropriateness of exporting cattle with less than 50% <i>Bos indicus</i> content. Poorer, cheaper cattle should be excluded from the market. Training that emphasises the commercial advantages associated with importing appropriate cattle (at least 50% <i>Bos indicus</i>). 	7.2.3
Religious	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	

<p>Geographic</p>	<ul style="list-style-type: none"> The management of heat load was a significant issue for feedlots. Feedlots near the coast benefited from a sea breeze; however, there was no discernable difference in the conditions experienced at sea level feedlots and high altitude feedlots. 	<ul style="list-style-type: none"> Feedlots located away from the coast and not subject to sea breezes may benefit from the introduction of additional shade. 	<p>7.2.1</p>
<p>Scientific</p>	<ul style="list-style-type: none"> The heavy reliance on by-products sourced from irregular suppliers would make the provision of a regular ration of appropriate dry matter, roughage, protein and metabolisable energy difficult. 	<ul style="list-style-type: none"> Encourage the regular testing of feed stuffs. 	<p>7.2.1</p>

Table 2: Operational, commercial, religious, geographic and scientific observations - Feedlots

5.2.4 Summary

Australian cattle observed in feedlots were generally in good condition and comfortable within the conditions. Several areas for improvement were identified and have been addressed in the recommendations. These included:

- **Technical support**

Issues associated with infrastructure, nutrition and the handling of livestock were identified in some feedlots and these were considered best addressed through the provision of technical support to feedlot operators.

- **Training**

Poor animal handling due to a lack of understanding of animal behaviour was observed in some feedlots. Feedlot staff would benefit from animal handler training.

- **Cattle selection**

Some of the Australian cattle observed in Indonesia were considered unsuited to the conditions, or were being managed in a way that rendered them unsuitable. The commercial advantages of importing cattle that are fit for purpose should be communicated to feedlot operators.

5.3 Slaughter

The trade in Australian cattle in Indonesia was found to be transparent and the tour group received unfettered access to facilities and staff. Abattoir operators and workers were generally welcoming, cooperative and unperturbed by the panel's presence. This was found to be the case at facilities where the visit was prearranged as well as at those facilities where the visit was impromptu.

5.3.1 General observations

The following in-market observations do not relate directly to the OIE Code but were considered to be important in providing context.

5.3.1.1 Overview

During the study, 29 cattle were examined during slaughter in 11 abattoirs. These abattoirs were typically free of offensive smell and animal noise suggesting a good standard of animal welfare.

The presence or otherwise of offensive smells and animal noise was used as an indicator of animal welfare by the expert panel at each facility with offensive smells and excessive noise suggesting underlying animal welfare issues.

Abattoir capacity varied from three head per night to 200 head per night.

Slaughter in Indonesia is generally undertaken according to Halal requirements.

Stunning was used in several advanced facilities; however, most facilities were unsophisticated and the adoption of stunning technology would be unfeasible.

5.3.1.2 Restraining boxes

Restraining boxes were observed to be used when available with traditional slaughter observed in one location.

In total, 15 APFINDO/MLA/LiveCorp restraining boxes were observed in operation, along with six copy boxes. These boxes were observed to offer significant benefits during the slaughter process through encouraging cattle to walk to the point of slaughter and then providing improved restraint, therefore reducing the risk of prolonged agitation and consciousness, during slaughter.

Standard Operating Procedure (SOP) was noted to be important to realising the potential benefits that the restraining boxes could deliver.

Restraining boxes were observed to significantly reduce the number of people required to undertake the slaughter process, thus delivering efficiencies but with possible social implications associated with unemployment. SOP training had been and was in the process of being delivered in conjunction with the installation of restraining boxes. There was an appreciable observed difference in the handling and obvious animal welfare benefits where this SOP training had been delivered.

Of the 26 acts of slaughter observed using restraining boxes:

- 17% of animals went down and regained their feet on release from the restraining box. This was typically associated with the restraining ropes being too long and SOP not being observed.

Of the 29 cattle slaughtered with and without restraining boxes:

- The severity of the fall during casting was scored in terms of the impact with the floor (0=none, 1=mild, 2=moderate, 3=marked). On average, the impact score for the 29 cattle was 1.6 (moderate).
- On average, there were 3.5 head lifts per animal once cast. Head lifts were observed to pose a significant risk to animal welfare.

Roping procedures were used at some abattoirs that almost completely prevented the animal from lifting its head and then, upon failing to rise, impacting on the plinth. This involved securing a rope around the beast's head or neck while in the restraining box.

While restraining boxes were observed to significantly improve animal welfare, where the severity of the fall was severe and head slapping occurred, significant animal welfare issues were identified that should be addressed through the SOP and training.

5.3.1.3 Copy boxes

Copy boxes are privately funded replicas of the industry funded restraining boxes and were found in several abattoirs thought to be practicing traditional slaughter. These were well designed, constructed and maintained; however, the operators lacked SOP training posing a potential animal welfare issue.

5.3.1.4 Slaughter technique

The cutting action, incidence of impaired bleeding and the occurrence of false aneurysm in the carotid arteries during Halal slaughter was monitored in the 29 cattle slaughtered.

This demonstrated that the number of cuts used when performing Halal slaughter varied considerably. In general, the standard was better at the abattoirs in West Java than in Sumatra.

In particular, at one abattoir in West Java, the incision was made with a single cut to the neck, whereas at an abattoir in Sumatra the neck was struck with a knife using a hard impact to sever the skin above the larynx and then up to 18 cuts were made to sever the neck and both arteries.

Although on all occasions both carotid arteries were completely cut, bleeding was significantly impaired in 10% of cattle due to false aneurysm formation in both carotid arteries, possibly resulting in extended consciousness. The SOP does not currently include guidelines for the management of occluded arteries and false aneurysm and slaughtermen were not observed to appreciate this as being a potential animal welfare issue.

5.3.1.5 Staff

The butcher was observed to own the cattle and supply the slaughtermen and labourers in most abattoirs. As such, large abattoirs operating on a service kill basis typically had many slaughter and butchering teams, each privately engaged and waiting for their employer's cattle to be presented for slaughter. In such a circumstance, cattle were identified with a paint brand. This often resulted in crowded slaughter floors at large abattoirs and variable standards of animal handling and slaughter.

In government abattoirs, the government supplied skilled animal handlers to work in the lairage. This standardised procedures and minimised risk.

5.3.1.6 Infrastructure

Abattoirs were typically dimly lit due to external infrastructure problems associated with the generation and delivery of electricity.

Despite there being no feed or water curfew for cattle being slaughtered in Indonesia, feed and water were not always provided in abattoir lairage. This was generally not considered to be an issue as cattle were typically only held for a short period (up to several hours), during the cool of the day (evening), prior to slaughter.

Observations made at wet markets indicated that meat colour and, therefore, pH had little effect on the saleability of meat. As such, slaughter operators were considered unlikely to enforce animal welfare standards and minimise stressful practices that may impact eating quality.

5.3.1.7 Welfare

Animal handler and slaughterman competency as well as the ability to effectively restrain cattle were considered to be the greatest factors potentially impacting animal welfare in the abattoir environment.

5.3.2 Review against the OIE code

The slaughter of Australian cattle in Indonesia was assessed against the OIE Code. A range of facilities and slaughter methods were observed including traditional slaughter, assisted traditional slaughter incorporating restraining boxes and slaughter using westernised abattoir facilities.

Measurable aspects of the OIE Code have been identified to allow performance against the OIE Code to be reviewed. These have been broadly categorised and summarised under the headings below.

5.3.2.1 Handling of livestock

Observations of the handling of livestock at the point of slaughter against the OIE Code:

- **Loading and unloading procedures**
 - The majority of abattoirs had reasonable facilities to allow the effective unloading and handling of livestock. One exception was noted where an unloading ramp was not observed; however, cattle were not delivered during the period of observation.

- **Overall handling (goads, dogs, lifting or painful handling etc)**
 - Handling at abattoirs was generally acceptable.
 - Practices were noticeably better and consistent with the OIE Code where SOP training had taken place.

- An electric goad was observed to be misused on one occasion (the animal was encouraged to move when there was no obvious path for escape).
 - Some instances of unnecessary stimulation involving interference with the eyes and tail twisting were observed immediately prior to slaughter once the animal was restrained and cast.
- **Handler skill, experience and training**
 - Handler skill was variable and ranged from excellent to poor. The better handlers were those whose task it was to only handle livestock.
 - Poorer handling was observed where specialist livestock handlers were not employed and handling was done by butchers and slaughtermen. Animal handling competence was generally poorer at smaller abattoirs where butchers were also responsible for handling.
 - On-the-job rather than formal training was typical.
 - **Groupings of livestock at the slaughterhouse**
 - The grouping of livestock was generally satisfactory with similar cattle from the same feedlot held together in lairage. Cattle were generally held in lairage at abattoirs for a short period of time, thus minimising the risk of animal welfare concerns arising from inappropriate animal grouping.
 - **Behaviour of livestock (stress, aggression etc)**
 - Livestock were typically calm up until the point of confinement within the restraining boxes. Cattle were inclined to become agitated if leg restraining ropes were not secured quickly. Cattle did become agitated if they were not effectively restrained or spent an extended period of time in the restraining box or in recumbency prior to slaughter.
 - One potentially fractious bull was observed; however, good animal handling mitigated the risks posed through handling such an animal.
 - Sensory stimulation, observed as disturbed behaviour in some animals, was apparent immediately prior to slaughter during the casting process and while restrained with ropes in recumbency. This was particularly apparent when buckets of water were thrown over the animal before slaughter.

- **Veterinary assistance and humane disposal (if required)**
 - Veterinary assistance was available at government abattoirs and some private abattoirs if required although the quality of this assistance was not assessed.
 - Sick or injured cattle were reportedly disposed of as soon as possible through the usual abattoir if possible. An exception to this was observed where an animal, injured during transportation, was left for an unacceptable length of time before being slaughtered.
- **Appropriate quarantine and disease control**
 - Animals arriving at abattoirs were generally slaughtered the same day and, as such, the risk of disease transfer ante mortem was minimal.

5.3.2.2 Facilities and equipment

Observations relating to facilities and equipment at the point of slaughter against the OIE Code:

- **Exposure to sights, smells or surfaces that may harm or stress livestock**
 - Cattle were exposed to visual stimulation immediately prior to slaughter when they were released from the control box and became cast on the plinth.
 - The approaches to the restraining boxes were often but not always of a non-slip construction.
 - Abattoirs were typically free of offensive smells and excessive noise.
 - Lighting was subdued and generally conducive to animal movement.
- **Overall lairage construction (size, ventilation, safety, lighting etc)**
 - Lairage construction was generally adequate; however, it was apparent that in most facilities, the lairage did not receive the same level of maintenance attention or investment as the slaughter and butchering facilities.
 - The lairage size was typically commensurate to the number of cattle able to be processed over a given period.

- Despite a general need for ongoing maintenance, particularly of surfaces, lairages were generally considered to be fit for purpose.
- Lairage was typically outdoors and well ventilated. Cover was provided at some abattoirs.
- **Facilities provided (feed, water, protection, bedding, ventilation, cleanliness)**
 - Feed, water, shade and bedding were not always available in lairage.
- **Cleaning and disinfecting procedures and facilities**
 - Abattoirs were reasonably clean and well maintained.

5.3.2.3 Slaughter processes

Observations of the slaughter process against the OIE Code:

- **Presentation of animal for slaughter**
 - Restraining boxes improved the ease with which cattle were presented for slaughter by allowing cattle to walk to the point of slaughter, as opposed to being physically dragged which is often the case in traditional slaughter. They also facilitated improved restraint, thereby reducing the risk of prolonged agitation and consciousness during slaughter.
 - SOP is critical to optimising restraining box operation. The inconsistent application of SOP resulted in variations in the presentation of animals for slaughter.
 - The process of washing the animal by hosing or bucketing water immediately ante mortem caused unnecessary stimulation and reaction in the cattle. This washing was reported to be a requirement of Halal slaughter; however, this claim was not verified.
- **Method and use of restraints for stunning or slaughter without stunning**
 - Restraining boxes improved the ease with which animals were presented for slaughter.

- Further restraint of the head using ropes was required in most circumstances and helped control inappropriate head movement.
- **Method of stunning (where used: captive bolt, electrical head-only)**
 - Where used, the method of stunning was via captive bolt (mushroom stunner) and this was used effectively and appropriately.
- **Time between restraint, stunning and bleeding (<20 seconds for stun-stick)**
 - The time between stunning and sticking was not always less than 20 seconds but was always less than 30 seconds.
- **Occurrence of stunning failure and actions taken**
 - Stunning failure was not observed. When this did occur, cattle were reportedly re-stunned as soon as possible.
- **Accurate, prompt and effective cutting for bleeding**
 - In some instances where stunning was not used the delay between restraint and slaughter was significant.
 - Cutting for bleeding was variable and ranged from excellent (one swift movement severing both carotids) to poor (up to 18 cuts applied). The average number of cuts was four.
 - In the 29 Halal slaughtered cattle, all carotid arteries were severed.
 - Following the Halal cut, there were occluded carotid arteries in 48% of cattle and possible extended consciousness in 10% of cattle. This could be managed with secondary sticking, where appropriate.
- **Halal slaughter processes**
 - There were differences in the way the Halal slaughter was conducted. This was particularly evident in the number of cuts used during slaughter.

5.3.3 Additional considerations

Operational, commercial, religious, geographic and scientific aspects of the slaughter of Australian cattle in Indonesia were observed. Areas for possible practice improvement that may promote an improved animal welfare outcome were identified. The observations recorded below relate to slaughterhouse operation and represent a consensus opinion of the independent expert panel. Where warranted, the possible improvements have been addressed through the specific recommendations made in section 7: Recommendations, and indexed below.

	Issue	Possible improvement	Recommendations
Operational	<ul style="list-style-type: none"> Large breeding bulls present handling difficulties, particularly at the point of slaughter, due to infrastructure limitations. 	<ul style="list-style-type: none"> Review the appropriateness of consigning heavy breeding bulls to Indonesia for slaughter. 	7.2.3
	<ul style="list-style-type: none"> Restraining boxes require ongoing maintenance. It is unlikely that this will be attended to by the abattoir owners. 	<ul style="list-style-type: none"> Implement a restraining box maintenance program. 	7.3.4
	<ul style="list-style-type: none"> The sideways opening action of the restraining boxes and the door's solid construction was observed to expose the animal to sudden audible and visual stimulation. This was not considered an issue in the abattoirs where the activity on the slaughter floor was minimal or where the door opened away from the activity on the slaughter floor. Excessive sensory overload was observed at busy abattoirs where the animal was suddenly exposed to the activity on the slaughter floor. 	<ul style="list-style-type: none"> A railed guillotine style gate was observed on a copy box at one of the abattoirs. This was effective and also reduced the risk of worker injury as a result of the swinging gate. A guillotine gate design may be considered as an option in the restraining box. Gates should be positioned to open away from the slaughter floor. This may not be practicable in all cases, depending on where Mecca is located relative to the layout of the abattoir. 	7.3.4

Operational continued	<ul style="list-style-type: none"> SOP for slaughter using restraining boxes were not always observed. 	<ul style="list-style-type: none"> Conduct training in all abattoirs using restraining boxes and monitor compliance. 	<p>7.3.2 7.3.3</p>
	<ul style="list-style-type: none"> Traditional slaughter was conducted using timber-partition yards in one location. This was the preferred method due to the residential location of the abattoir and the perception that the steel constriction of the restraining box would be too noisy. 	<ul style="list-style-type: none"> Continue discussions with the abattoir operator and present noise reduction options such as rubber matting. 	<p>7.3.5</p>
	<ul style="list-style-type: none"> On average cattle attempted to rise 3.5 times once cast and restrained. This usually resulted in head slapping. 	<ul style="list-style-type: none"> Investigate SOP that effectively restrain the head prior to casting to prevent head slapping against the concrete plinth. Investigate alternative roping techniques to achieve firmer restraint. 	<p>7.3.1 7.4.1 7.3.1 7.3.5</p>
	<ul style="list-style-type: none"> Excessive numbers of people present during animal handling. 	<ul style="list-style-type: none"> Conduct training to impress upon handlers the importance of minimising stress by limiting human interaction. 	<p>7.3.3</p>
	<ul style="list-style-type: none"> Each butcher supplies their own slaughterman and as such there are many slaughtermen and workers. This makes centralised training difficult. 	<ul style="list-style-type: none"> Consider the development of a training DVD that addresses restraint and slaughter. 	<p>7.3.2</p>

<p>Commercial</p>	<ul style="list-style-type: none"> Aspects of meat quality adversely affected by stress at the point of slaughter (colour, tenderness, etc) are not recognised in the market place. As such, there is no commercial incentive to improve animal welfare at the point of slaughter. 	<ul style="list-style-type: none"> In the place of commercial incentives to promote animal welfare at the point of slaughter, promote the adoption of SOP and the development of enforceable standards. 	<p>7.4.1</p>
<p>Religious</p>	<ul style="list-style-type: none"> Halal and regulations do not require a feed and water curfew prior to slaughter. Despite this, not all abattoirs provided feed and water. 	<ul style="list-style-type: none"> Encourage the installation and use of water troughs at abattoirs. 	<p>7.3.4</p>
	<ul style="list-style-type: none"> Animals are washed, generally indiscriminately through the bucketing of water, once cast, reportedly as part of the Halal slaughter process. This stimulated the animal and encouraged attempts to rise, often resulting in head slapping. 	<ul style="list-style-type: none"> Investigate the need for washing under Halal and if unnecessary, revise the SOP to discourage washing. Where washing is practiced and if required under Halal, encourage more precise hosing to avoid water contacting the animals face, especially the eyes. 	<p>7.3.1</p>
	<ul style="list-style-type: none"> Despite being allowed under Halal, stunning is rarely practiced. 	<ul style="list-style-type: none"> Stunning was observed to overcome the majority of risks to animal welfare associated with the slaughter process and the use of stunning should be promoted at every opportunity. 	<p>7.3.6</p>

<p>Geographic</p>	<ul style="list-style-type: none"> Geographic idiosyncrasies in restraint and slaughter practices were observed in Lampung that differed significantly from those observed in Jakarta and Bogor. The technique of head roping and number of cuts to effect slaughter delivered an inferior animal welfare outcome in Lampung. 	<ul style="list-style-type: none"> Implement SOP training for handling, restraint and slaughter in Sumatra. 	<p>7.3.2 7.3.3</p>
<p>Scientific</p>	<ul style="list-style-type: none"> Arteries were observed to become occluded on 48% of cattle with both arteries blocked in 10% of cattle possibly leading to extended consciousness. 	<ul style="list-style-type: none"> Investigate the possibility of introducing a secondary incision, as practiced in western abattoirs, in the SOP to promote bleeding and minimise the effect of occluded arteries. 	<p>7.3.2</p>

Table 3: Operational, commercial, religious, geographic and scientific observations - Slaughter

5.3.4 Summary

Slaughter was considered to pose the greatest risk to animal welfare. Several areas for improvement were identified and have been addressed in the recommendations. These included:

- **SOP**

The SOP, in combination with restraining boxes, currently deliver significant animal welfare benefits; however, a review of the SOP to address several issues identified during the assessment would deliver additional benefits.

- **SOP training**

Additional and regular training to encourage the use of SOP in conjunction with restraining boxes would deliver animal welfare benefits.

- **Restraining box – maintenance and repair**

Restraining boxes delivered significant animal welfare benefits; however, these require ongoing maintenance to promote their continued use.

- **Restraining box - modification**

Several design changes may improve the operation of the restraining boxes and promote additional animal welfare benefits.

- **Stunning**

Stunning was observed to deliver the single biggest animal welfare benefit and the general adoption of stunning in the slaughter of Australian cattle in Indonesia should be an aspirational goal.

5.4 Emerging issues

5.4.1 Maintenance of restraining boxes

The installation of restraining boxes commenced in 2006 and over 100 boxes have subsequently been installed. Some of these boxes are now in need of repair and it is expected that if they become unusable, abattoirs will revert to traditional casting for slaughter.

Restraining boxes deliver obvious animal welfare benefits, primarily by removing variables associated with restraint for the slaughter process and therefore minimising the risk of a poor animal welfare outcome. Any reversion to traditional casting would be a retrograde step for animal welfare. This report recommends the introduction of a program to oversee the inspection and, if required, maintenance or repair, refurbishment or replacement of the restraining boxes.

5.4.2 Market instability

Market instability threatens the ongoing development of the trade in live cattle from Australia to Indonesia.

An actual or potential reduction in demand for Australian live cattle may have immediate and long-term consequences for the welfare of Australian cattle in Indonesia through reduced investment in infrastructure and in-market assistance.

5.4.3 Increased use of copy boxes

Slaughter practices in Indonesia are changing due to the introduction of industry funded restraining boxes and copy boxes.

While innovative adaptations were observed in these copy boxes and their introduction was seen to be delivering significant animal welfare benefits, the unregulated and unsupervised nature of their installation and the lack of SOP training where copy boxes are installed present potential animal welfare risks.

These issues would be mitigated through the development of design and installation guidelines for copy boxes and through encouraging the adoption of SOP to promote best practice and optimal animal welfare outcomes. Training would also be beneficial at locations where copy boxes are known to have been installed.

6 Conclusions

The independent study into animal welfare conditions for cattle in Indonesia from point of arrival from Australia to slaughter was conducted in a cooperative environment characterised by unfettered access to a port, feedlots and abattoirs. The definition of animal welfare against which observations were made and recommendations and conclusions drawn was consistent with the OIE definition as recorded in the OIE Code (7.1.1).

Animal welfare was generally noted to be good. While deviations and incidents of non-compliance with the OIE Code were observed and have been noted within this report, along with recommendations to address these issues, Australian cattle in Indonesia were generally found to be coping well with the conditions to which they were exposed.

Three critical areas were identified by the expert panel as significantly influencing animal welfare:

- Animal management
- Slaughter
- Standards

6.1 Animal management

6.1.1 Animal handling expertise

Animal handling expertise was variable and ranged from excellent to poor. A significant improvement in handling was observed where SOP training had been delivered indicating that investment in animal handling training was delivering animal welfare benefits.

The extension of SOP and SOP training to include other sectors involved with the supply of Australian cattle, such as the transport sector, especially Indonesian truck drivers, and feedlots, could be expected to deliver further benefits.

6.1.2 Nutrition

Ration mixes were variable with their suitability influenced by the availability and quality of local by-products and the suitability of feed milling equipment. There was evidence of specialist advice and international experience having a positive effect on feeding and, therefore, animal welfare. Continued assistance in this area, particularly with respect to the feeding of roughage as part of a total mixed ration, will deliver ongoing animal welfare and production benefits.

6.1.3 Livestock suitability or quality

Not all cattle observed in Indonesia were suited to the conditions. Potential animal welfare issues would be minimised by ensuring that only animals suited to the conditions are exported to Indonesia; in particular, a minimum standard of 50% *Bos indicus* should be enforced.

6.2 Slaughter

6.2.1 Facilities

The installation of restraining boxes and the adoption of copy boxes has delivered obvious animal welfare benefits at the point of slaughter. These benefits have largely been delivered through the standardisation of procedures and removal of variables presenting risks to animal welfare. A number of recommendations have been made that, if implemented, will deliver further animal welfare benefits through SOP refinement and slaughter facility maintenance and improvement.

6.2.2 Method

Practices at the point of slaughter have the greatest influence on animal welfare for Australian cattle in Indonesia.

All animal welfare issues observed at the point of slaughter were overcome through the use of non-lethal stunning. Adoption of non-lethal stunning in Indonesian slaughter facilities supplied with Australian cattle should be promoted at every opportunity.

Other more immediate solutions to the issues encountered at the point of slaughter involve building upon the SOP training currently being provided to handlers and slaughtermen. A marked improvement in animal welfare was observed where this SOP training had taken place.

6.3 Standards

The OIE Code was not supported by a locally enforced code governing animal welfare practices. Animal welfare benefits would accrue from the introduction of practical, auditable and enforceable animal welfare standards within Indonesia.

Australian cattle in Indonesia were typically comfortable in the circumstances in which they found themselves. The animal welfare issues encountered through the study were generally considered best addressed by extending or modifying programs currently being undertaken by MLA and LiveCorp with the support of the Australian and Indonesian governments.

7 Recommendations

The following recommendations represent the consensus view of the expert panel. These recommendations address divergences between the OIE Strategy and Code and observed practices and other issues considered to impact animal welfare. Cultural, religious, economic and geographic influences impacting the application of the OIE Code were also considered in the formulation of the recommendations.

7.1 Transport

7.1.1 Training

That driver and handler training be introduced and SOP training extended to address:

1. Driver
 - a. Handler positioning (point of balance, flight zone).
 - b. Noise control.
 - c. The use of goads.
 - d. Unacceptable handling methods.
 - e. Fitness to travel.
2. Handler
 - a. Handler positioning (point of balance, flight zone).
 - b. Noise control.
 - c. The use of goads.
 - d. Unacceptable handling methods.
 - e. Fitness to travel.
 - f. Emergency slaughter.

This training may be augmented through the provision of instructional DVDs.

7.1.2 Truck crate design and operation

Develop guidelines for optimal livestock transport truck crate design and operation (ventilation, non slip flooring, waste disposal, cleaning and disinfecting).

7.1.3 Rest points

Encourage the introduction of rest points with unloading facilities for long haul journeys and for use in the case of emergency.

7.2 Feedlots

7.2.1 Technical support

That the program for the delivery of information and technical support to feedlots containing Australian cattle be expanded to emphasise the following issues:

1. Infrastructure
 - a. Correcting uneven walkways and protrusions into yards.
 - b. The introduction of gates or removable lower railings along races to assist in the emergency removal of animals.
 - c. The introduction and maintenance of appropriate bedding.
 - d. The importance of shade in managing heat stress and cost effective ways to increase shaded area.
2. Nutrition
 - a. The importance of including five to 10 cm roughage in a total mixed ration.
 - a. The use of rumen buffers to minimise the incidence of lactic acidosis.
3. Handling
 - a. The importance of maintaining clean cattle and promoting thermoregulatory behaviour in managing heat stress.
 - a. The importance of grouping animals appropriately, especially with respect to horned and unhorned animals.

7.2.2 Training

That handler training be introduced and SOP training extended to address:

1. Handler positioning (point of balance, flight zone).
2. Noise control.
3. The use of goads.
4. Unacceptable handling methods.
5. Fitness to travel.
6. Emergency slaughter.

This training should be regular and may be augmented through the provision of instructional DVDs.

7.2.3 Cattle selection

Encourage, through education and training, the supply of cattle from Australia that are fit for purpose. Cattle observed in market that were considered unfit, or that were being managed in a way that rendered them unfit, included:

1. Cattle with less than 50% *Bos indicus* content.
2. Horned cattle and cattle with scurs as a result of poor dehorning practices on Australian farms.
3. Pregnant heifers supplied when spayed and non-pregnant heifers were ordered.

7.3 Slaughter

7.3.1 SOP

That the existing SOP be reviewed to minimise time spent by cattle in restraining boxes and in recumbency. This may include:

1. In box neck rope placement.
2. Improved leg restraint.
3. A revision of the washing technique.

7.3.2 SOP training

That regular slaughtermen training be introduced and SOP training extended to address:

1. Principles when casting cattle.
2. Knives (sharpening, type).
3. Cutting method – minimising the number of cuts.
4. The management of occluded arteries.

This training should be regular and may be augmented through the provision of instructional DVDs.

7.3.3 Preslaughter handling

That handler training be conducted on a regular basis and SOP training extended to address:

1. Handler positioning (point of balance, flight zone).
2. Noise control.
3. The use of goads.
4. Unacceptable handling methods.
5. Emergency slaughter.

This training should be regular and may be augmented through the provision of instructional DVDs.

7.3.4 Restraining box – maintenance and repair

That a program for the maintenance, repair and modification of handling facilities in abattoirs with restraining boxes be introduced. This should address:

1. The maintenance of restraining boxes.
2. Issues associated with lairage design, particularly lighting, the removal of distractions and impediments to the flow of cattle and the provision of feed, water and, where appropriate, bedding.
3. Race design should be reviewed where possible to include gates to assist in the emergency removal of animals.

7.3.5 Restraining box - modification

Consider restraining box modifications to:

1. Incorporate rubber matting to act as a buffer and minimise sound when cattle kick out in the boxes.
2. Achieve better head restraint.

7.3.6 Stunning

Encourage the adoption of stunning in the slaughter of Australian cattle in Indonesia.

7.4 Other

7.4.1 Standards

Encourage the Indonesian government to develop local animal welfare standards relating to imported Australian cattle covering training, record keeping, planning, emergency slaughter and slaughter including assigning responsibility and definition of Competent Authority as referred to in the OIE Code.

7.5 Additional considerations

Additional considerations anticipated to deliver animal welfare benefits include:

- Non-lethal stunning was observed to deliver the single most significant improvement in animal welfare conditions for cattle in Indonesia from point of arrival from Australia to slaughter and should be encouraged.
- The centralisation of abattoirs to facilitate the standardisation and regulation of operations should be encouraged along with the introduction of internationally recognised quality assurance programs.
- The restraining box and SOP training programs are delivering obvious benefits to animal welfare in Indonesia. These programs should be maintained and, where possible, expanded.

Appendix 1: Expert panel profiles

Professor Ivan W. Caple, BVSc (Hons, Uni of Melb), PhD (Uni of NSW), MACVSc

Professor Ivan Caple grew up on a farm with dairy and beef cattle, pigs, horses, and lambs for home kill, in South Gippsland, Victoria. Professor Caple spent 11 years as a Senior Veterinary Research Officer with the Victorian Department of Agriculture conducting research on diseases of cattle, sheep and horses. His overseas work has included being an Aid Expert with the Colombo Plan in Malaysia (1975) teaching veterinary physiology at Universiti Pertanian; as a Scientist with ANARE at Macquarie Island (1976); and as a Research Fellow at the University of Leeds (1984) while recipient of an AMLRDC Senior Research Award. Previous visits to Indonesia have been made in 1975, 1997 and 2002.

Present appointments

Chair, Writing and Reference Groups for the Australian Animal Welfare Standards Guidelines for Sheep and Cattle (from 2008). Chair, Industry Review and Technical Working Group, Australian Livestock Corporation Ltd (from 2009). Member, Australian Animal Welfare Advisory Committee (from 2005). Fellow, Animal Health Australian Ltd (from 2008). Professor Emeritus, Faculty of Veterinary Science, University of Melbourne (from 2008).

Previous appointments

Dean (1991 – 2006), Professor of Veterinary Medicine (1985-2007), Faculty of Veterinary Science, University of Melbourne. Supervisor of 20 PhD and 30 Masters postgraduate students who completed postgraduate degrees on topics including welfare of sheep in the live export trade. Principal author or co-author, of over 200 articles in journals, books, and industry publications on nutritional and metabolic disorders of sheep and cattle, and livestock diseases.

Independent expert chairman, National Consultative Committee on Animal Welfare (1997-2006), Member, Independent Reference Group (2000, 2002) and Keniry Review (2003), that reported to the Australian Government on ways to improve the welfare of animals in the live export trade. Chair, RSPCA Australia Scientific Advisory Committee (1997-2006).

Chair of the Expert Panel in Veterinary Science of the Australasian Veterinary Boards Council (1996 – 2006); Member and Deputy President of the Veterinary Board of Victoria (1987 – 2007); Scientific Associate (1986 – 1989), Board Member (1990-1996), and member of the Animal Ethics Committee (1997-2009) of the Zoological Parks and Gardens Board of Victoria which is responsible for the management of Victoria's three Zoos – Royal Melbourne Zoo, Healesville Sanctuary, and Werribee Zoo.

Awards for professional work include: Fellow (2000), Australian Veterinary Association (AVA); Life member, Australian Cattle Veterinarians (1998); Gilruth Prize, the AVA's most prestigious award for contributions to veterinary science (2001); Honorary Life Fellow, RSPCA Victoria (2000). Ian Clunies Ross Award (1980), Australian College of Veterinary Scientists.

Professor Neville G. Gregory, *BSc (Hons, Aberdeen Uni Scot), PhD (Uni of Bristol, UK)*

Academic appointments

- Research Scientist and subsequently Head of Abattoir Division, Meat Research Institute (re-named Institute of Food Research) 1976-1990.
- Senior Research Fellow and Head of Abattoir Division, University of Bristol 1990-1994.
- Professor of Animal Welfare Science, Veterinary Faculty, Massey University, New Zealand 1994-1998.
- Science Director, Meat Industry Research Institute of New Zealand, 1998-2000.
- Research Director, SARDI, Flaxley Agricultural Centre, Australia, 2000-2003.
- Professor of Animal Welfare Physiology, Royal Veterinary College, UK, 2003.

Other appointments

- Member of the EU Scientific Veterinary Committee 1989-1994.
- Member of National Animal Welfare Advisory Committee NZ 1996-2004.
- Chairman of PIRSA Animal Ethics Committee Australia 2001-2003.
- Member of the CEC Working Group preparing the draft proposal on the protection of animals at the time of slaughter or killing 1988-1991.
- Scientific Adviser to the Council of Europe Working Group on Stunning and Slaughter 1990-1991.
- Member of WSPA scientific Advisory Panel 1992-2008.
- Member of Australian RSPCA Scientific Advisory Panel 2001-2007.
- Member of the ad hoc group on the Humane Slaughter of Animals (OIE) 2003-2004.
- Member of ISO TC 191 Working Group on Standards for Humane Animal Traps 1994.
- Scientific Adviser to the IWC Working Group on Cetacean Killing Methods 1996.
- Member of the Independent Working Group on Snares (UK) 2005.
- Member of editorial board of Outlook on Agriculture 1998-2007. Senior editor 2010-.
- Scientific Adviser to the International Meat Secretariat 2009-.

Awards

- George Fleming Prize, British Veterinary Journal 1984.
- RSPCA/BSAP Prize for innovative developments in Animal Welfare 1984.
- American Meat Science Association International Lectureship Award 2009.

Published research papers and other scholarly works (Total = 284)

- | | |
|--|-----|
| • Original refereed scientific articles | 168 |
| • Published invited lectures, book chapters, abstracts | 138 |
| • Books | 6 |

Doctor Paul Cusack, BSc, BVSc (Hons), MVSt, MACVSc, PhD

Dr Paul Cusack is a consultant cattle veterinarian, ruminant nutritionist, and beef producer with post-graduate training in the intensive and extensive ruminant industries.

His post-graduate training covers the disciplines of nutrition, health programmes, reproduction, epidemiology, production management and meat science.

He completed a Master of Veterinary Studies from 1992 to 1993 while an Intern then Resident at Queensland University Pastoral Veterinary Centre and teaching Year V BVSc students. In 2007 Dr Cusack completed his PhD on the interaction between nutrition and health in feedlot cattle.

Dr Cusack is currently Director of Australian Livestock Production Services, owner and principal of Cowra Veterinary Centre, and owner/manager of a cattle trading enterprise. His consultancy clients at Australian Livestock Production Services cover intensive and extensive cattle and lamb enterprises throughout the eastern states of Australia.

Appointments

- Lecturer in Feedlot Medicine and Production for the Bachelor of Veterinary Science at Charles Sturt University (2007-current).
- Lecturer in Feedlot Medicine and Production for Year V BVSc students at Queensland University (1993-2002) and at Sydney University (1996-2007).
- Head Examiner in Beef Cattle Medicine and Production for the Australian College of Veterinary Scientists (2004-2006).
- Australian Lot Feeders Association representative on the Emergency Animal Disease Preparedness Consultative Committee (2004-current).
- Distance Education Tutor in Ruminant Nutrition with the Post Graduate Foundation in Veterinary Science (1999-onwards).

Memberships

- Member of the National Beef Genetics Extension Review Committee (2001/2002).
- Member of the organising committee for the World Association of Buiatrics Congress, Sydney(1998).
- Journal Editor and Executive Member of the Australian Association of Cattle Veterinarians (1994-1996, President 1997).
- Gained membership of the Australian College of Veterinary Scientists (ruminant nutrition) by examination (1997).

Awards

- Awarded Meat Research Corporation (now Meat & Livestock Australia) Australasian Junior Research Fellowship (1997).

Doctor Penelope McGown, BVSc (Uni of Sydney)

Doctor Penelope McGown has followed a lifetime interest in beef cattle production, beginning on her families' cattle property at Moree, involving genetics and show ring promotion of stud Hereford cattle and currently operating two agriculture properties in north west NSW.

After gaining Bachelor of Veterinary Science from The University of Sydney in 1997, Dr McGown followed her career in beef cattle production. Initially in mixed practice in northern NSW then as a company vet for Stanbroke Pastoral Company.

Dr McGown specialises in northern pastoral industry project work and embryo transfer. Achievements in this area include recent completion of a large industry funded trial on economic impacts of BEF virus in northern Australian beef herds and a Benchmark Project for a large pastoral company.

Appointments

- Assistant for Peter Atkinson BVSc. Embryo Transfer (current).
- Research consultant for Australian Agricultural Company (June 2005-current).
- Consultant Stanbroke Pastoral Company (2003-2004).
- Veterinary Officer, Stanbroke Pastoral Company (2002-2003).
- Locum, Manly Rd Veterinary Clinic and Samford Veterinary Hospital, QLD (2002-2002).
- Veterinarian, Moree Veterinary Clinic, Moree NSW (2001-2001).
- Veterinarian, Nandewar Animal Health Services, Barraba NSW (1999-2000).
- A. Regan and Colleagues Vet. Surgeons, Lancashire UK (1999).
- Locum, Valentine and Cogan Veterinary Clinic, Castleton UK (1998, 1999).
- Locum, Sambrook and Partners Veterinary Surgeons, Kent UK(1998).
- Veterinarian, Moree Veterinary Clinic, Moree NSW (1998).

Memberships

- Veterinary Surgeons Board of Qld (2001-current).
- Association of Australian Cattle Vets (1998-current).
- Veterinary Surgeons Board of NSW (1998-current).
- Australian Veterinary Association (1996-current).
- Royal College of Veterinary Surgeons (1998-2000).

Research projects

- Identification of Possible Causes of Foetal or Calf Loss on the Barkly Tableland (2004).
- Principal Investigator for MLA project; Economic Impact of BEF Virus in Extensive Northern Beef Herds.