



finalreport

LIVE EXPORT

Project code: LIVE.229
Prepared by: Geoffrey Beere¹ & Sharon Pettiford
¹Amal Services Pty Ltd
Date published: June 2005
ISBN: 1 74036 677 8

PUBLISHED BY
Meat & Livestock Australia
Locked Bag 991
NORTH SYDNEY NSW 2059

Opportunities to improve
slaughter standards and
profitability in Indonesia

Table of Contents

1	Abstract	2
2	Executive Summary.....	2
3	Background.....	3
4	Project Objectives	4
5	Methodology	4
6	Results and Discussion	4
6.1	Objective One - To observe the restraining boxes (Mk I and Mk II) in operation and advise on all associated infrastructure issues.	4
6.2	Objective Two - To observe the behaviour of abattoir staff and advise if options for training are feasible to improve animal welfare.	6
6.2.1	Private abattoirs.....	6
6.2.2	Public abattoirs – city and provincial	6
6.3	Objective Three - To identify a list of Critical Control Points for future assessment of those abattoirs processing Australian cattle.....	7
6.4	Objective Four - To advise on options for preparing animal handling posters and flyers for abattoirs.....	9
7	Success in Achieving Objectives.....	9
8	Impact on Meat and Livestock Industry – now and in five years time	9
9	Recommendations.....	10
10	References	12
11	Abbreviations.....	12
12	Appendix 1	13

1 Abstract

A consultant's visit to Indonesia provided an opportunity to observe and evaluate the treatment and slaughter processes of Australian cattle in domestic abattoirs. Significant funds from the Australian live export industry have been injected into Asia via the design and placement of cattle restraining boxes in a variety of abattoirs. This ongoing activity has had a significant impact on facilitating improved slaughter techniques coinciding with improved animal welfare.

Critical control points were identified and will be further assessed in abattoirs processing Australian cattle. This will also help address animal welfare concerns and will provide long-term benefits to meat processors and slaughtermen by improving their operational efficiency and workplace safety. It will also contribute to improved meat quality via less bruising and prolonged shelf life.

Initiatives to address the issues discussed in this report will substantially improve the animal welfare standards of both Australian and domestic Indonesian cattle. Improvements in this key area will contribute to the long-term viability of this important export trade for Australia. This will be achieved by the continuous improvement of handling facilities, handling techniques and slaughter methods. Large welfare gains are realistically possible through reasonably low cost infrastructure improvements and applied livestock handling training of personnel.

2 Executive Summary

A visit by Geoffrey Beere and Sharon Pettiford to Indonesia was conducted between 29 April and 11 May 2005 to address the following objectives:

1. To observe the MLA sponsored restraining boxes (Mark I and Mark II)¹ in operation and advise on all associated infrastructure issues. This includes design of lairage, raceways and forcing pens.
2. To observe the behaviour of abattoir staff and advise if options for training are feasible to improve animal welfare. This includes both pre slaughter and during slaughter.
3. To identify a list of Critical Control Points for future assessment of those abattoirs processing Australian cattle. This may include the level of cattle vocalizing, slamming of gates, dragging and/or beating of animals and the length of time it takes for slaughtered animals to become unconscious.
4. To advise on options for preparing animal handling posters and flyers for abattoirs and livestock trucks.

Indonesia imports on average 400,000 beef cattle annually from Australia. The viability of this market is vital for the long-term sustainability of the live export industry in Australia. Australia's trade with Indonesia has strongly underpinned the overall growth in the live cattle trade.

Much of the beef consumed in Indonesia is purchased from the fresh market system, with cattle sold to local butchers who sell through the wet markets. This system accounts for approximately 90% of imported Australian cattle.

The installation of slaughter restraining boxes in abattoirs throughout parts of Indonesia has resulted in improved animal welfare during ritual slaughter of Australian cattle. It is a priority of Meat and

¹ Refer LIVE.309 Manual for cattle slaughter restraining boxes, Geoffrey Beere, October 2004

Livestock Australia and Livecorp to continue to identify methods of improving the traditional pre-slaughter and slaughter handling of cattle in South East Asia.

Another issue that needs addressing is that beef from Australian cattle is currently being discounted in the Asian marketplace. This occurs primarily because of inappropriate pre-slaughter management and slaughter techniques. This decreases muscle glycogen and increases the cellular pH resulting in dark cutting beef, therefore reducing shelf life and overall product value. This meat can be discounted by as much as 30%.

There is enough evidence to suggest that if management is improved from the holding yard to the point of slaughter, Australian cattle will produce meat with a lower pH and more optimal meat colour. This product will not be discounted in the wet market and will have a longer shelf life. An extra three hours shelf life is significant in the Indonesian wet market. Processors of Australian cattle are more likely to respond to and implement introduced techniques that improve shelf life and meat colour because it will result in an increased financial return.

As well as addressing animal welfare concerns, the restraining boxes are also addressing the meat quality issues discussed above. However there are other handling, husbandry and infrastructure issues from discharge of the animals to the point of slaughter that need more work to further improve animal welfare. The design of lairage areas and of the whole abattoir area, from the livestock vehicle arriving at the abattoir to the slaughtering of animals, is of great importance in relation to animal welfare and meat quality.

This report recommends that animal welfare can be further improved in Indonesia by accelerating bleeding at slaughter, introducing a system of auditing individual abattoirs and yard designs and improving awareness amongst butchers and stockmen. It is important to highlight to the workers what they can change in their day to day practices that will have an impact on the quality of the meat they are producing. This will primarily be achieved through better handling and slaughter techniques.

A discussion is provided detailing the current issues and alternatives followed by recommendations for industry to consider. This report highlights and summarises some of the main issues and provides some practical comments upon existing practices and facilities at the abattoirs visited in Indonesia. Hopefully this document will stimulate discussion and actions that will continue improve slaughter procedures for both abattoir staff and livestock.

3 Background

In 2000 the live export industry identified improving the traditional pre-slaughter and slaughter handling of imported Australian cattle in Asia and the Middle East to be a priority. In Asia Australian cattle have generally been discounted in the market place. This is due to sub-optimal slaughter techniques resulting in a lowering of muscle glycogen and an elevated muscle pH producing dark cutting meat with a reduced shelf life. By improving animal welfare during pre-slaughter and at slaughter, meat quality is improved, operator safety is enhanced and the efficiency of processing is superior.

4 Project Objectives

- 1 To observe the restraining boxes (Mk I and Mk II)¹ in operation and advise on all associated infrastructure issues. This includes design of lairage, raceways and forcing pens.
- 2 To observe the behaviour of abattoir staff and advise if options for training are feasible to improve animal welfare. This will include both pre slaughter and during slaughter.
- 3 To identify a list of Critical Control Points for future assessment of those abattoirs processing Australian cattle. This may include the level of cattle vocalizing, slamming of gates, dragging and/or beating of animals and the length of time it takes for slaughtered animals to become unconscious.
- 4 To advise on options for preparing animal handling posters and flyers for abattoirs and livestock trucks.

5 Methodology

The following approach was taken in compiling this report:

- Visits were made to a cross section of abattoirs with and without restraining boxes to assess associated infrastructure and slaughter techniques
- Interviews were conducted with industry personnel including importers, feedlot operators, stock traders, abattoir workers, relevant government department officials and wet market butchers

6 Results and Discussion

6.1 Objective One - To observe the restraining boxes (Mk I and Mk II) in operation and advise on all associated infrastructure issues.

During the consultancy we visited the following abattoirs:

- RPH Karawaci
- RPH Bayur
- RPH Chakung
- RPH Pulo Gadung
- Santori Abattoir at Cibitung
- RPH Rumpin
- RPH Cibinong
- RPH Cikaret
- RPH Depok
- RPH Bogor
- RPH Cirangrang
- PT Santori Agrindo Feedlot
- PT. AGRO GIRI PERKASA – Agriculture and Livestock Management
- DILAMO Feedlot – Bandung

The original concept of improving the welfare of animals in Indonesian abattoirs was to focus on restraint and slaughter. Fifteen years ago, there was no suitable restraint for Australian animals at the point of slaughter. Australian cattle exported to Indonesia have had minimal handling and human

contact and require appropriate infrastructure leading up to, and at the point of slaughter. Local cattle are more domesticated and are able to be handled with less infrastructure.

The restraint of the cattle at slaughter was addressed in early 2000 by the design, manufacture and installation of numerous cattle restraining boxes¹. As of May 2005, two issues have progressed:

1. Currently 100% of privately owned abattoirs are using restraining boxes. There is also an increasing percentage of provincial and municipal government abattoirs making use of the equipment.
2. Pressure from the slaughtermen in government abattoirs can block the usage of the restraining boxes. For example, two high throughput municipal city abattoirs (at Bogor and Bandung) were not utilising restraining boxes due to pressure from slaughtermen. Further attempts to implement the use of the restraint boxes in these locations will proceed due to recent changes in abattoir management at the government level.

Recent visits discovered that abattoirs previously provided with a restraining box have copied and installed additional boxes and some abattoirs not provided with a box have built their own by copying from another abattoir. It can be assumed that an unknown number of abattoirs not yet identified have also copied the restraining box. Traditionally transfer of technology between abattoirs in Indonesia was slow and not common. Copying and installation of the restraining boxes within and between abattoirs demonstrates that the abattoirs are recognising the improved operator safety and processing efficiency benefits from use of the boxes. Traders of live cattle and managers of government abattoirs have sold the concept of the restraining boxes to other abattoirs. The two major advantages of the restraining boxes have been operator safety and improved animal welfare to the point of slaughter; this has also resulted in improved meat quality.

Whilst gains have been made with the introduction of restraining boxes, further improvements are necessary. There are locations that have facilities that are not satisfactory and there are opportunities to improve infrastructure within these existing abattoirs that will not only improve animal welfare but processing efficiencies and meat quality. This will encourage uptake of changes in the abattoirs.

From what has been observed of the design of lairage, raceways, forcing pens and unloading ramps there is a need to standardise facility design, i.e. basic measurements such as heights and widths of panels, gates, raceways.

Facilities should be designed so that animals want to flow through the yards in the desired direction, not so they have to be forced. If constant force is required to move animals through yards, then they probably need redesigning. In the best designed facilities, all the handler should have to do is open and shut gates.

Facilities should be designed with the natural circling behaviour of livestock in mind:

- Curved races
- Closed in sides
- Minimal distractions and noise
- Optimal light – stock like going from darker to lighter areas, not the other way around.

During the consultancy there was opportunity to visit the partially constructed abattoir at Bogor which has been built to meet the city requirements (the existing abattoir is being condemned mainly due to its location in the middle of the city). It was apparent that the planning authority had pulled out old

plans from many years ago. The availability of 3-D drawings of yard plans would have been an advantage and it would have saved the planning authority time and money.

It is recommended that 3-D drawings of yard sections accompanied by engineered infrastructure drawings (Refer Appendix 1) are supplied to the management of existing and proposed abattoirs.

Yard sections of priority include:

- Unloading ramps
- Forcing pens
- Pens to hold 15 – 20 cattle (cattle entering at one end and exiting the opposite)
- Feed and water troughs
- Typical yard panels, fixed gates, typical hinges, slide gates and vet crush (plated and unplated)
- Raceways
- Simple 2 way drafts
- Laneways.

Other areas that need to be investigated are hygienic slaughter and carcass dispatch.

6.2 Objective Two - To observe the behaviour of abattoir staff and advise if options for training are feasible to improve animal welfare.

To provide advice on performance to abattoir staff it is important to understand the hierarchy of the abattoir business in Indonesia.

6.2.1 Private abattoirs

The majority of private abattoirs in Indonesia supply their own stockmen as the cattle are still owned by the abattoirs until after the point of slaughter.

The wet market butcher (seller) will contract a team of usually 4 slaughtermen. This team will restrain, slaughter, de-hide, weigh the carcass and load the product onto a vehicle. The vehicle in turn will deliver the carcass and offal to the butcher's stall at the wet market. The majority of sales in this instance are sold on a carcass weight at the slaughter floor door.

6.2.2 Public abattoirs – city and provincial

Public city abattoirs (approx. 15 in Jakarta) are managed by the city or mayors office with a government veterinary officer in charge.

Importers or traders hold cattle in the existing lairage facilities near the abattoir. Alternatively they build temporary pens if there isn't a lairage infrastructure in place. Wet market butchers negotiate deals with traders and use the contract slaughter team which drafts the beast, restrains and slaughters it. There could be a government meat inspector on duty. The management structure within provincial abattoirs is similar to that of city abattoirs.

The priorities of the MLA/Livecorp joint program have been to target and support the leaders in the private abattoirs and the better managed public and provincial abattoirs. Due to the enormous turnover of people in the slaughter teams and their relatively low social status it is not a good strategy to invest in training personnel in 'animal handling' practices at this level. Rather, infrastructure

upgrades and design improvements will more effectively assist animal welfare and meat quality issues.

A reduction in welfare problems in abattoirs can be partly achieved by designing and building new yard sections. Renovation of existing facilities and cattle handling equipment will be beneficial with the aim of taking the man away from the cattle, thus negating problems associated with training staff that turn-over regularly.

However, it has been identified that there is opportunity to train staff in the use of restraining boxes. The best approach for achieving this objective is to organise a competent professional slaughterman from an advanced abattoir to conduct training sessions. The focus should be on how to move the animal towards the restraining box and then once the animal is in the box, restrain it as quickly and quietly as possible. Furthermore the slaughterman can demonstrate the effective restraint of the animal on its side, allowing a good clean cut, which will promote rapid bleeding and a prompt loss of consciousness. Opportunities for posters and videos to train staff in restraining boxes are discussed under objective four.

Abattoirs have been able to copy a restraining box (due to the many manuals on restraining boxes being handed out), however they are unable to copy other cattle handling infrastructure as such as manuals do not yet exist.

6.3 Objective Three - To identify a list of Critical Control Points for future assessment of those abattoirs processing Australian cattle.

Various Critical Control Points (CCP) (*Grandin 2001*) were identified during the Indonesian visit to abattoirs that are processing Australian cattle. A preliminary audit has been compiled to address issues such as facility design, lighting, noise (cattle vocalising), bleed time and observation of the time it takes for the animal to lose consciousness.

Temple Grandin (2001) has listed CCPs that should be monitored on a regular basis during slaughter to maintain and improve standards of animal welfare:

- Percentage of animals slaughtered correctly on the first attempt
- Percentage of sensible or partially sensible animals within 30 seconds of their throat being cut
- Percentage of animals slipping or falling anywhere in the facility
- Percentage of cattle which vocalise during handling and subsequent restraint
- Percentage animals prodded or poked with electricity or hard implements
- Handling of downed or non-ambulatory animals (% downed animals).

Research has shown that the amount of stress endured by individual animals during handling is highly variable. This is possibly due to the different levels of psychological stress (fear) from animal to animal. Both previous experience and genetic factors affecting temperament will interact in complex ways to determine how fearful an animal may become when it is handled and subsequently restrained (*Grandin, 1997*).

Introduction of an auditing system to measure the identified CCPs will increase awareness and help improve productivity and animal welfare within the abattoir environment.

A check list of the general abattoir environment immediately prior to slaughter may include the following:

- Are the races enclosed to prevent the animal from seeing people and equipment? Yes / No
- Do the raceways have non-slip flooring? Yes / No
- Is the lighting optimal? Yes / No
- Are any of the cattle vocalising (noise)? Yes / No
- Is there a supply of clean water in lairage? Yes / No
- Is there a familiar ration available in lairage? Yes / No
- Is there feed available in lairage? Yes / No

The primary use of an audit system will be for Australian advisers to measure performance on an animal by animal basis. The secondary use of the audit will be for private slaughter floor operators, government staff and feedlot owners to monitor standards. Table 1 illustrates what could potentially be recorded during an audit.

Table 1. Illustration of potential audit record form.

Plant Name:	Auditor Name:	Date:	No. Animals:	
Animal agitated		Yes	No	
Vocalisation in raceway		Yes	No	
Time in restraint box		<1min	>1min	
Vocalisation in restraint box		Yes	No	
Slip or fall in the restraint box		Yes	No	
No. times slip or fall in box				
Bleed time		<30 seconds	>30 seconds	>2min
Corneal response		Yes/No	Yes/No	Yes/No

Another area that needs attention is to accelerate (normalise) bleeding once the animal's throat has been cut. It was noted by Grandin (1997) that an animal should lose consciousness within 10 seconds of the cut being made, if the slaughterman is competent. It was observed by the authors during their recent visit that there are significant numbers of animals being slaughtered in Indonesia that are taking longer than 10 seconds to lose consciousness. There is a need to investigate avenues to accelerate bleeding which result in a faster loss of consciousness and improved animal welfare.

If the animal is left standing in the box for extended periods of time, it becomes agitated, stressed and this has long-term implications on meat quality. Cattle allowed to stand in the restraining box will tend to jump, especially Brahman infused cattle. It has also been observed that these cattle take longer to lose consciousness which is not favourable from an animal welfare standpoint.

Observations indicate that cattle that are fed a "familiar ration" in lairage will be less stressed and more confident prior to slaughter. This management tool appears to have a significant impact calming the animal prior to slaughter and reducing the time it takes for the animal to lose consciousness. It should be noted that this has not been scientifically validated; however it would be valuable to scientifically quantify this affect. This would result in improved animal welfare at lairage prior to slaughter.

6.4 Objective Four - To advise on options for preparing animal handling posters and flyers for abattoirs.

The design and production of posters for abattoirs would provide an educational resource for abattoir workers. The focus needs to be on the use of the restraint box. Photographic images of well operated abattoirs extending from the lairage to the restraint of the animal could be compiled and displayed in the abattoirs that require improvements in their operation.

A demonstration video of a superior “halal” abattoir operator showing restraint and bleeding will be a beneficial training tool. It was obvious to the consultants during abattoir visits that abattoir personnel enjoyed looking at photos from other abattoirs and seeing how they operate.

7 Success in Achieving Objectives

Success was achieved in making a thorough assessment of current infrastructure. There is ongoing opportunity for review and improvement of infrastructure throughout Indonesian abattoirs.

8 Impact on Meat and Livestock Industry – now and in five years time

The immediate impact of improved handling facilities and better slaughter initiatives will be to jointly improve animal welfare and to alleviate risk from community concerns which may threaten current and future market access. The latter has become increasingly prominent in Australia during the past 12 months within the sheep industry and is a genuine concern for the live cattle trade.

Additionally addressing these animal welfare concerns will also offer benefits to the abattoirs and slaughtermen concerned, through improved efficiencies, improved meat quality and a safer working environment that will increase adoption of these recommendations.

Addressing the issues discussed in this report to substantially improve animal welfare standards of Australian and domestic cattle in Indonesia will contribute to the long-term viability of this valuable trade. The growth of the live cattle trade should continue with strong demand from Asia coupled with reliable supply from Australia. Short-term supply fluctuations occur with high domestic prices for Australian beef, but the long term outlook is positive provided other issues that threaten the market are identified and addressed now. One of the major areas of opportunity is in the improvement of handling facilities and slaughter methods. Relatively large welfare gains are possible through reasonably low cost infrastructure improvements and applied livestock training of personnel.

9 Recommendations

The consultants see that welfare issues and economic returns go hand in hand. The following recommendations are made:

1. Develop a manual of essential yard plans to provide to management of existing and proposed abattoirs. This manual would comprise three dimensional and engineered drawings. This will encourage improvements to lairage, raceway, forcing pen design and unloading ramps, providing facilities more suitable for handling Australian cattle (see Appendix 1). The yard sections would be designed to utilise local building materials. The yard section plans would focus on:
 - Unloading ramp
 - Forcing pen
 - Pens to hold 15-20 cattle
 - Yard panels (plated and unplated)
 - Feed and water trough design
 - Fixed gates
 - Hinges
 - Sliding gates
 - Cattle crush
 - Raceways
 - Simple 2 way drafts
 - Laneways
2. Training of personnel working in the abattoir system in Indonesia would not have the same benefits that it has in Australia due to the temporary and largely unskilled nature of the workforce in Indonesia. Further consultation is needed on how best to go about training this network of people. As discussed in Recommendation 1, improved infrastructure will bring about positive welfare improvements more effectively. However it has been identified that training in the use of restraining boxes would be beneficial using competent professional slaughterman from an advanced abattoir to conduct training sessions, along with video and poster material outlined in Recommendation 4.
3. The introduction of an abattoir auditing system to measure the identified CCPs will increase awareness and help improve productivity and animal welfare within the abattoir environment. The primary use of this system will be for Australian advisers to measure performance. The secondary use of the audit will be for private slaughter floor operators, government staff and feedlot owners to monitor performance standards.
4. Observations indicate that cattle that are fed a “familiar ration” in lairage will be less stressed and more confident prior to slaughter. This management tool appears to have a significant impact claming the animal prior to slaughter and reducing the time it takes for the animal to lose consciousness. It should be noted that this has not been scientifically validated; however it would be valuable to quantify this affect.
5. Photographic posters of recommended slaughter procedures should be prepared and distributed in countries that require “halal” slaughter. A demonstration video of a good “halal”

abattoir operator showing restraint and bleeding will be a beneficial training tool. This video should be suitably edited so that it is not controversial.

6. It is imperative that the joint MLA/Livecorp program have a document prepared and a simple and accurate media response in the event of an overseas or Australian media report on slaughter practices in Indonesia. The media response needs to highlight that considerable progress has been made upgrading abattoir infrastructure over the past 7 years.

10 References

Beere, G.B. (2004) Manual for cattle restraining boxes. Report submitted to Meat and Livestock Australia – Project Number: LIVE.309.

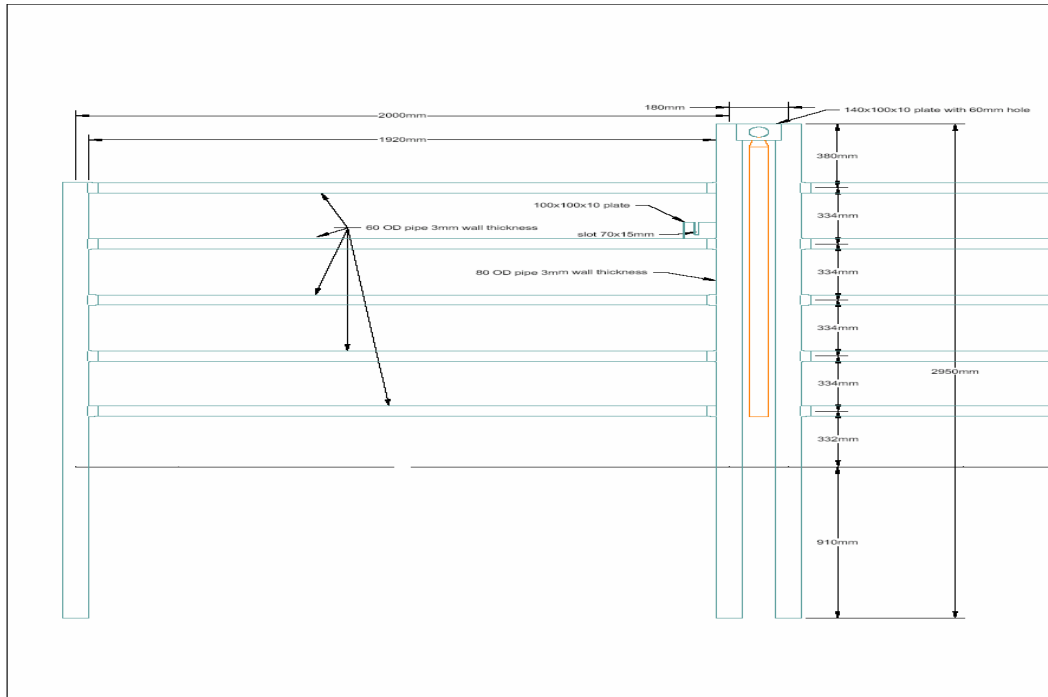
Grandin, T. (1997) Assessment of Stress during Handling and Transport, *Journal of Animal Science*, **75**, pp. 249-257.

Grandin, T. (2001) Cattle Slaughter Audit Form. *Based on American Meat Institute Guidelines.* (www.grandin.com)

11 Abbreviations

RPH = Rumah Potong Hewan (veterinary room of slaughter)

12 Appendix 1



Willies Gate fence plan

YARD SECTIONS - If you supply a picture (model) and an engineering drawing, the local tradesmen are able to copy.

