

live *export*

Development of a manual of yard plans for South-East Asian abattoirs

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Abstract

There continue to be new abattoirs being constructed in Indonesia however licensing authorities design and construct lairage yards that are generally more suitable for led, domestic cattle. As a result, there was an opportunity to be proactive to produce and distribute a manual that details abattoir yard infrastructure design from the unloading ramp to the restraining box.

The development and publishing of a 70 page Manual of Yard Plans including 3-D models was carried out as part of Australia's live export industry's goal to improve animal welfare, processing efficiency and meat quality in countries that process Australian cattle.

It has been observed that Asian builders and engineers within the cattle industry were not afraid to copy from a manual or a picture, even if there were some subtle differences in the end product. This was one of the main drivers of this project to produce a manual of abattoir yard designs. The manual also includes chapters on work safety and simple equipment lists.

Executive Summary

The necessity to have an abattoir yard manual was first identified prior to 2000 when it was observed that there was no standardisation in the construction and design within the cattle lairage of Asian abattoirs. In many instances existing cattle yards were responsible for injuries to imported cattle and injuries to local stockmen. In Indonesia there are some 380 Indonesian Government licensed abattoirs that have been identified and at least 60 of these facilities process significant numbers of Australian cattle on a daily basis.

This project set about to summarise yard designs that that will improve meat quality, the shelf life of the meat product, animal welfare and working conditions.

The distribution of the manual was coordinated in Indonesia with the release of a DVD demonstrating the management and slaughter of cattle in the Indonesian market. The Director of Veterinary Public Health, Ministry of Agriculture Indonesia endorsed and assisted with the national distribution of the manual and DVD.

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1 Background

Many Asian abattoirs lack suitable infrastructure to manage imported cattle prior to slaughter. This is particularly so for those cattle that had bypassed an Indonesian feedlot and had travelled directly from the port of entry to an abattoir. These cattle are weary, hungry and uncooperative.

It was observed that as the CIF value of cattle increased dramatically from 1998 onwards, industry personnel including importers, feedlotter's and traders became increasingly aware that improvements in equipment at the ports that discharged cattle and transport to feedlots led to increased profits. At the same time positive changes were taking place in the design of feedlots and more attention was given to the nutritional requirements of feeder cattle.

The live export industry continues to upgrade their management with resulting increases in profits and animal welfare standards with imported feeder and slaughter cattle.

Feedlotter's and traders in Indonesia lose ownership of their cattle at the abattoir and have no control over the butcher [wet market]. This is mostly due to the traditional methods of marketing cattle in Indonesia where the trader or feedlotter is payed for the animal after the butcher has trimmed the carcass to his requirements [similar to over the hooks trading]. Historically these abattoirs lack suitable equipment and infrastructure to maintain the welfare of cattle with most being Government owned and butchers having no interest in maintaining the facilities. In the past 3 – 4 years we have seen a few individual butchers and some private abattoir owner-operators that understand there is some correlation between pre and post slaughter management and increased shelf life and better meat colour. There are several privately owned slaughter houses that slaughter for wet market butchers in Jakarta and it is easy to observe that improved facilities are resulting in improved meat quality.

Local engineers and contractors have no suitable abattoir cattle yards to copy from or plans of yards from which to copy. There are no Government standards, building codes or guidelines for the construction of cattle yards.

There is considerable evidence in Asia that shows that Mark 1 cattle restraining boxes are being locally constructed and installed successfully from a manual. These are referred to as 'copy boxes'. However, often the connecting race, forcing pen and swing gate for which there was no plan was not built to any specifications, which meant dimensions and materials used were not appropriate. Figure 1 shows an existing abattoir yard. Similarly the internal drainage and concrete surfaces of abattoir cattle yards were also unsuitable and were causing injuries to livestock.

For example, at the municipal abattoir in Koto Bogor, one can observe in the holding pens that there are 8 different designs of sliding gates for cattle with none of them working effectively. We observed that if a piece of equipment was suitable, people have no trouble copying it. Hence the idea to enhance the use of engineered drawings with computer generated 3-dimensional models published in a hard cover manual.

Figure 1 Section of abattoir yard in Indonesia.



In early 2005, the Live Export Program [LEP] funded a project to investigate ways to improve animal welfare in Indonesia. Sharon Pettiford and Geoffrey Beere undertook the consultancy and completed a report titled "Opportunities to improve the slaughter standards and profitability in Indonesia". A key recommendation from that report was:

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. 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 un plated)
- Feed and water trough design
- Fixed gates
- Hinges
- Sliding gates
- Cattle crush
- Raceways
- Simple 2 way drafts
- Laneways.

2 Project Objective

To develop a manual of essential yard plan sections comprising three dimensional and engineered (to exact scale) drawings.

3 Methodology

The following approach was taken in compiling the manual for this project LIVE.236:

- The first step was to source an appropriate engineer subcontractor to assist with the design, modelling and drawings. The engineer was equipped with a CAD program called Turbo Cad. This program was seen to have quality features to produce suitable drawings and 3-D images for a manual.
- The engineer was supplied with photos, sketches and designs of suitable yard infrastructure with every component in the manual designed and drawn to utilise steel products that are available in Indonesia and Malaysia. This was always a confusing experience in the past as yard or equipment plans drawn in Australia or another country would have included steel material of dimensions not available in Asia, so it was unlikely that equipment would function properly.
- Components in the manual are of basic designs and utilising the most cost effective materials for their construction.
- The yard designs attempted to incorporate features to minimise human contact and animal stress.
- The consultant communicated with Dulux ICI Indonesia and requested a letter that would recommend suitable products and procedure for painting new and old steel work
- The consultant also visited the Darwin University's engineering workshops to study the basic requirements of "Work Safety" and "Personal Protective Equipment" so as to include these principles in the manual.

When the manual was half completed, the manual was presented as a draft to a number of people in Indonesia (see Figure 2), including:

- APFINDO members, which include, EO Pak Teguh Boediyana, Director Pak Nurendro Trikesowo, Director Pak Dicky Adiwoso, Director Pak Yudi Guntara and Ibu Sunarti.
- Director of Public Health.
- Private Abattoir Operators.
- Existing yard builders and engineers in Indonesia.

Figure 2 Presenting the draft manual to the Indonesian Ministry of Agriculture



4 Impact on meat and livestock industry

The manual developed out of this project will have something for every one. The most important beneficiaries will be the yard builder or contractor, the owners of the cattle when they are at the abattoir and the local stockman that have to move the cattle through the yards from the unloading ramp to the restraining box.

It is unlikely that Indonesia will be able to rely on private enterprise to take over the slaughtering of the majority of livestock. The Government will have to retain that responsibility for the foreseeable future, which will mean the construction and or renovation of abattoirs. The manual will assist or influence the design of the abattoir cattle yards.

5 Conclusions and Recommendations

In the past 10 years, an important issue was the penetration of imported cattle and their meat products into the large cities and regions of Indonesia. Without abattoirs that are able to restrain and manage imported cattle, this was a continuing problem. As a result, there was very little meat from imported cattle entering the wet markets in these large cities and regions. To increase the sales of imported live cattle there has to be suitable facilities to slaughter them. The manual will help to fill that vacuum.

This manual of yard plans would be suitably complemented with a manual showing the design of a traditional abattoir including effluent management to slaughter 15 head per night and an abattoir that could slaughter 25-30 head per night. This would be a natural progression for the livestock export industry.