STOCKMAN’S HANDBOOK
TRANSPORT OF CATTLE BY SEA
Short & Long Haul Voyages

Prepared for the LiveCorp
SHIPBOARD PROGRAM

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AUSTRALASIAN LIVESTOCK SERVICES PTY LTD
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1. INTRODUCTION

Background

As a result of problems encountered some years ago during the transport of cattle on long haul voyages, the industry implemented the Shipboard Program. The key element to this program of self-regulation was the provision of an independently appointed Accredited Stockman on each long haul voyage (excluding SE Asia, Japan and Korea – classed as Short Haul).

LiveCorp developed an Accredited Stockman training course to produce stockmen needed for the program as well as Long and Short Haul Stockman’s handbooks to assist stockmen during their voyages. These handbooks were later converted into a single document.

Following the Cormo Express incident, the industry regulation changed again with the introduction of new legislation and the Australian Standards for the Export of Livestock (ASEL).

The information contained in this document reflects these recent policy changes and is a combination of current Government regulations, scientific fact, informed best guesses and the hard won experience of a large number of exporters and stockmen and a small number of veterinarians operating in the trade. The details presented are constantly under review pending further experience and the results of ongoing scientific research. Suggestions for changes or improvements from interested parties are always welcome.

ASEL Standard S4.5 (Version 2.1)
“An accredited stock person who is employed by the exporter and who is not ordinarily a member of the ship’s crew must be appointed to accompany each consignment of livestock for export to its destination. In addition, if required by the relevant Australian Government agency, an accredited veterinarian must be appointed to accompany a consignment.”

Short Haul and Long Haul voyage differences

Long Haul (LH)
• Accredited Stockman must report daily to AQIS in a specified format

Short Haul (SH)
• Daily reporting is at the discretion of the exporter

Accreditation

Stockmen become accredited by attending a LiveCorp training course. Those attending the course must have a sound background in handling livestock and are usually nominated for the course by an Exporter. Each stockman (both male and female stockmen can be accredited) must pass an examination at the end of the training course at which time they become Provisionally Accredited. After completing two satisfactory voyages they are granted full Accreditation. A register of Accredited
Accredited Stockman's Role (Long Haul)

- Normal stockman’s duties working with the ship’s Master and crew to promote the health and welfare of the livestock on board
- Taking appropriate action to prevent or address livestock problems in conjunction with Master and crew
- Observation and recording of specific parameters and events on board
- Detailed regular daily reporting of these observations to AQIS as set out in Appendix 14
- Acting on directives from the Exporter or consulting veterinarian as required
- Collection of post mortem samples and data on mortalities where appropriate
- Production of detailed report for AQIS at the end of the voyage as per Appendix 16
- Carrying out research activities as required

The Short Haul stockman’s role is essentially the same as above except that reporting to AQIS is only required at the end of the voyage.

Lines of Communication and Responsibility

The Master of the vessel is ultimately responsible for all activities on board the vessel. In the majority of cases the stockman will discuss any matters of concern with the Master, the Chief Officer or the Bosun and a course of action will be agreed upon. On some of the larger vessels there may be a “Head Stockman” position in the crew. In this case the Accredited Stockman will communicate directly with him.

ASEL Standard S5.6 a) requires that “A meeting must be held daily to discuss all issues relating to the health and welfare of the livestock. This must include the Master and/or the Master’s representative and the accredited stock person...”

Under no circumstances should the stockman attempt to undertake any major management initiative without the knowledge or cooperation of the officers and crew.

The aim of the Livecorp Accredited Stockman’s program is to provide competent, qualified stockmen to travel aboard livestock shipments to maintain the welfare of the stock and to carry out the necessary reporting functions. Feedback from experienced stockmen allows the industry to constantly improve the management and welfare of animals during sea voyages.
**Dispute Resolution**

In the unlikely event that the stockman is not able to convince the Master or crew to take a certain course of action that he feels, if not followed, may result in an extremely serious threat to the welfare of the stock then the following course of action is the correct procedure to take.

- Send a communication through the Master to the Ship Owner and the Exporter explaining the problem and outlining the various solutions proposed.
- A response will be sent from these parties to the Master.
- Both parties will be obliged to follow the instructions provided from shore.

In the event that the Master or crew still refuse to cooperate, the stockman should follow the Master’s instructions, regardless of his personal views and provide a full report on the matter at the end of the voyage.

**Confidentiality**

All information collected as a result of any voyage must be regarded as confidential. This is especially important if you are approached by members of the press. Any such approaches should simply be referred to the exporter.

**Organisational Arrangements**

Accredited stockmen are trained by LiveCorp and a record of available persons is held by the LiveCorp Shipboard Program Manager (based in Sydney: 1800 237 655).

Exporters are solely responsible for arranging to secure the services of an accredited stockman for the voyage.

The Exporter will then be responsible for communicating with the stockman to advise when and where they will be required to join the vessel.

The Exporter will be responsible for the daily fees of the stockman and his travel expenses from the time he leaves home to travel to the ship till the time he arrives back at his home after the voyage.

Accredited stockmen can be employees of an exporting company or private contractors. If they are employees then they will be covered for Workers Compensation, Superannuation etc. by the Exporting company. If the stockman works as a contractor then he or she is personally responsible for all these matters.

Once stockmen have successfully completed the Accreditation course, they will be classed as Provisionally Accredited. After the satisfactory completion of two voyages they will become fully accredited by LiveCorp.

At the present time the minimum fees for Provisionally Accredited Stockmen is AUD$150 per day while fully Accredited Stockmen must be paid a minimum of AUD $200 per day. Rates of pay over these levels are for private negotiations between the stockman and his / her employer.

Provisional and Accredited Stockmen should keep the LiveCorp Shipboard Program Manager up to date on their availability to travel with shipments.
Insurance
The stockman should clarify with the Exporter if he is covered for workers compensation type insurance by the Exporting company. In most cases this will be the normal arrangement. If the Exporter is not able to provide this cover then the stockman should ensure that he makes his own arrangements to provide such insurance cover.

LiveCorp has secured a special insurance policy to cover stockmen for matters other than workers compensation. This policy is a free service to stockmen who are employed by Exporters who are members of LiveCorp. See the Insurance certificate in Appendix 10 for the details of the cover provided. In order to be eligible for this cover, stockmen must notify LiveCorp of their proposed travel before leaving Australia.

This insurance is available to stockmen, veterinarians and others travelling overseas on business for livestock exporters. The insurance cover includes travel by both air and sea.

2. PRE SHIPMENT PROCEDURES

Stockman's responsibilities
The principal role of the stockman is to assist the Exporter to load the vessel in an efficient manner while monitoring the welfare of the stock.

He should arrive at the vessel with everything that is required to undertake the journey. See the Personal Check List attached in Appendix 8.

The Load Plan
Clarify with the exporter who is responsible for the preparation and execution of the load plan. In some cases this job will be done by the Chief Officer of the vessel, the exporter or delegated to the stockman. A carefully prepared load plan is critical to the success of a voyage.

If possible, find out from others (previous stockmen, exporters, Chief Officer, Bosun, crew) the particular factors on this ship which may make it different from others, eg tips for easy loading, hot spots, location of slippery decking, bad corners etc. Go on board before loading and have a good look at the vessel yourself. Identify potential problem areas and make contingency plans in case they develop into actual problems during loading.

Find out the details of the stock in respect to numbers, weight, type, breed, origin, transport history etc.

Confirm with the exporter, the AMSA approved Net area for cattle on this vessel and the AMSA / AQIS loading density regulation which will be enforced for this voyage. Using this information and the type and weight information of the cattle, prepare a load plan. An example of a blank load plan form is attached in Appendix 1.
General guidelines for load planning

Heavier cattle are usually loaded onto the lower decks first to ensure the stability of the vessel. This may not always be the case especially on the large cattle vessels where there are different exporters on the one ship or there is a two-port discharge. It is also important to try to put less athletic stock nearest to the exit hatches. On short haul this will apply to heavy slaughter cows, oxen, buffalo and bulls as these animals may have difficulty climbing long ramps from the bottom of the vessel at the end of the voyage. Pregnant dairy cows are another category which will need special placement nearest the exit hatches whenever possible.

A different density calculation should be made for each weight range group of stock. Identify any animals that need special consideration eg, fat Herefords or other heat sensitive temperate breeds should be located where the ventilation is the best, breeding cows will benefit from extra space. Cattle which are loaded in a tired condition will benefit from extra space initially even if this is at the expense of other stronger and fitter cattle that can be loaded a bit tighter for a short time.

Brahman cross cattle from tropical zones will be best placed to handle the hotter locations on the vessel.

Once a final load plan is approved by the exporter, provide a copy to the Chief Officer and discuss the details. Ensure that individual numbers and types set for each pen are known and understood by the Bosun and crew. In most cases the appropriate number will be written in chalk on each pen to allow for efficient flow of cattle.

Immediately prior to the commencement of the loading process recheck everything yourself including races, ramp attachments, bad corners, sight boards, sawdust or sand on slippery spots, any sharp protrusions into raceways etc. Check again with the exporter to determine if any changes have been made to the delivery sequence, weights or types of stock being loaded. If so, review your load plan accordingly.

Ensure that you understand the correct lines of communications in case you need to discuss problems during the loading process. In most cases the Chief Officer will be in overall charge of the loading arrangements while the Bosun will be the person in charge of getting the correct number of animals safely into their appropriate pens.

If you run into significant problems then the exporter should be informed immediately.

During the actual loading process the stockman is best placed to observe the overall process from the flow of animals from trucks, down into the ship and into their pens. By moving around during loading, problems in any area can be identified and addressed. Constantly monitor what cattle are coming on board and check to ensure that they match with the load plan. If for instance some trucks have arrived and unloaded out of sequence, then it will be necessary to determine if any changes need to be made to the plan. Consult with the exporter and the Bosun. Don't be afraid to hold up the loading to deal with a problem.

Special watch should be kept on slippery corners and areas where animals are blocking up. Attempt to fix the cause of the blockage or arrange to station a crewmember in the problem area to assist with maintaining a good flow of cattle. A smooth flow of stock is much more important than speed. If any animals are
injured during the loading process, attempt to isolate them or at least identify their location on board so you can attend to their needs as soon as you are able.

Make a note of any problems encountered during loading to ensure that others are aware of them next time.

3. PRE SHIPPING FACTORS AFFECTING THE TRANSPORT OF CATTLE

Breed and Type

*Bos taurus* types (British and European breeds) are less heat tolerant than *Bos indicus* (Brahmans and Brahman Cross).

Herefords and Friesians seem to be particularly susceptible to heat stress with Angus a close second.

Higher-grade Brahman cattle will generally cope best with heat stress.

Heavier animals will generally be less agile and more susceptible to stress, injury and illness during loading and transport.

Females and larger ox have wider hips and will more frequently strike their hip extremities causing hip haematomas (fluid filled swellings).

Hereford, Friesian and Angus are much more susceptible to eye infections.

Over fat animals will be much more susceptible to heat stress than leaner animals of the same weight and breed.

Nervous, agitated stock will be much more likely to suffer from heat stress and injury than calm stock.

As a general rule older cows are the poorest travellers of all types of cattle. Pregnant females will always need more care than any non-pregnant class of stock. See special notes for pregnant cattle including dairy cattle in Appendix 17, 18 & 19.

Cattle with horns can cause problems injuring other stock or preventing them from accessing the feed and water troughs. Horned animals should be penned with other horned animals and given extra space.

Where bulls are shipped together, riding activities can be a serious cause of injury. Animals, which are constantly ridden, should be removed from the pen. Those animals that constantly try to ride others frequently wear their hooves down and should be isolated if possible or placed in a pen with high levels of bedding.

Bull calves travelling to Israel have special needs. A detailed report on the needs of bull calves travelling on long haul voyages is available from LiveCorp. See Appendix 16 for a summary.

Origin of the stock

Animals from temperate areas will be much more susceptible to heat stress than the same breed and type of animals sourced from tropical areas.
Stock sourced during the winter will be more susceptible to heat stress than the same animals exported during the summer months.

Stock sourced from areas where feed is particularly lush may have more trouble adjusting to shipboard fodder than those from areas where feed quality is low.

Those animals which have travelled long distances immediately prior to loading will be tired and more susceptible to loading injuries and all the stress factors on board. The ASEL standards clearly specify travel time limits and rest periods required prior to loading.

Check with the exporter as to which animals have been acclimatised to the shipboard fodder in holding depots prior to loading. These animals will take to the feed on board much more quickly.

Have the animals had any vaccinations or treatments that may impact on their ability to travel? For example, Tick Fever vaccination can cause fever and illness in some cattle about 10-14 days after injection.

All livestock being prepared for shipment must pass through a Registered Premises approved by AQIS. Final inspections for fitness to travel will be carried out at the registered premises prior to the issuing of the “Permission to Leave for Loading” (PLL) by the AQIS veterinarian.

**Animals are not permitted to be loaded onto a vessel before the PLL has been issued by AQIS.**

**Feed and Water Curfews**

Most livestock will arrive at a ship direct from a nearby registered premises hence curfews are principally a commercial matter rather than a welfare one. The exporter will advise if any animals have had a curfew and if special attention to feed and water is appropriate.

A small number of registered premises are more than 200 km from the loading port. Animals, which have travelled more than 200 km to reach the ship, will have lost around 5% of body weight due to emptying of the gut. This "weight loss" will be regained during the first few days on board. Allowance for this "weight gain" should be made when calculating the loading densities.

Any stock which have had a curfew or those which have travelled some distance to the ship should receive a higher priority for the first feeding and watering on board.

**Storage of fodder and other supplies**

While the stockman will not have a major role in the storage arrangements for the fodder, it is important to ensure that small items such as the sawdust, electrolytes or chaff are not buried under large quantities of feed where they will be difficult to access. Discussions with the exporter and Chief Officer prior to the loading of the fodder and other supplies should ensure that this problem is avoided.
Preshipment Equipment Checklist

In the busy environment of a loading vessel, it is easy to forget some items of equipment, which will be vital to the success of the voyage. While the principal responsibility for this lies with the exporter, a back up check by the stockman can be very valuable. Checklists are provided in the appendices covering the veterinary supplies and medicines as well as personal items that may be of use during the voyage. Always refer to this checklist before preparing to join the ship.

Exporters Instructions

The ASEL require the exporter to provide detailed instructions to the Master and the stockman in relation to the care of the livestock during the voyage and any special requirements for reporting and discharge. Make sure you receive these instructions prior to sailing. Ensure that the reporting arrangements are very clear to both yourself and the Master as failure to report to AQIS as required can lead to severe penalties for the exporter.

4. ONBOARD MANAGEMENT

Cattle Observation

This is the key to assessing the performance of the stock. The recording of the individual observations will assist the stockman to determine what steps if any need to be taken to ensure the comfort of the stock as well as forming the basis of reports to the exporter or AQIS.

There are a number of simple observations that can be made without annoying or distressing the animal which, when considered together, allow anyone on shore with this information to draw a relatively clear picture of the welfare of individuals or groups of animals.

There are no hard and fast rules about when animals should be observed but these few general guidelines are recommended as a minimum.

- First thing in the morning
- During the hottest part of the day - whenever that may be - usually noon to mid afternoon (the hottest time in Middle Eastern waters may be just before dawn)
- After the stock have had a chance to finish most of their feed - assuming they are eating normally

When the animals are first loaded they will often become quite agitated by the close proximity of humans walking down alley ways adjoining their pens. This excessive nervousness will usually disappear after the first twenty-four to forty-eight hours. Initial activities in the hold should be limited to essential movements of stock from tight to loose pens or to allow for access to injured animals. All human movement in the cattle space should be done calmly and quietly. Sudden movements or loud noises will startle the animals and cause them to rush away from the disturbance. Try to keep
the numbers of people in the hold to the minimum and where possible only use experienced staff.

It is a matter of judgment as to what cattle movements and other interventions are made immediately after loading. This will be a compromise between making the essential moves while leaving less urgent changes until the animals have settled down the following day. If in doubt, discuss the options with someone with more shipboard experience.

Respiration

Respiratory rate - breaths per minute is an excellent indicator of heat stress or ventilation efficiency. Note the rates of a number of individuals in each area and get an average. When examining sick or suspect animals compare their rate to the average. Healthy cattle on vessels which are not under any heat stress have respiratory rates in the 25 to 40 breaths per minute range.

Respiratory character - for reporting purposes this has been divided into three categories - normal (reported as 1), panting (reported as type 2 respiratory character) and gasping = tongue out, drooling and literally gasping for air (reported as type 3). The reporting format is covered in Appendix 14.

Appetite

Feed consumption is an excellent means of identifying distressed animals. One of the first things to happen when cattle are placed under any form of stress is that they reduce their feed consumption, the more severe the stress the more significant the reduction. Under severe stress animals will simply not eat at all. During the routine observation of the animals after feeding times it is very obvious if any groups are not eating as they will be the only ones with fodder left in their troughs. When non eating groups/areas are identified this is the trigger for an immediate investigation as to the reasons for this and the development of a plan to address the problem whatever it may be.

Average feed consumption for the whole ship is also an excellent indicator of the general comfort of the stock. Daily feed consumption will often be similar for the whole shipment and reported as a single figure. The exporter may request additional
information such as a breakdown of the individual group consumption rates and this may also be presented as a percentage of body weight.

**Water consumption**

This can usually only be determined from the Chief Officer's calculations although there will be some instances where groups can be identified as not drinking. As above, this should prompt an immediate investigation as to why and what to do to fix the problem. Daily reports will usually present a single figure as an average for the ship as for fodder consumption. Normally consumption will slowly rise from 5-20 litres per day over the first few days to around 30 - 35 litres per day when mature cattle are drinking normally. Cattle under extremely hot conditions will frequently drink up to 45 litres per day. Remember that the ship's gross water consumption figure will usually include water wasted when troughs are cleaned out.

**Dehydration**

The level of dehydration of an animal is a very useful guide to its health and general condition. A simple pinch test can provide a crude but helpful guide to the animal's level of hydration. Just pinch a loose area of skin; the neck is usually the easiest, when the animal is eating. If the skin springs back immediately to its normal position then the animal will be fully hydrated (score 1). If the skin stays up in a little wrinkle for up to 10 seconds and the coat looks dull with mildly sunken eyes then the level of dehydration is up to 6 % (score 2= medium). If the skin stays in the pinch position for more than 10 seconds and the animal has deeply sunken eyes and a very dry, dull coat then the dehydration will be greater than 6 % (score 3 = severe). Note in your diary the actual number of seconds that the wrinkle takes to go away.

**Faecal (Manure) Consistency**

The form of faeces an animal is producing is a good guide to its general health and performance. For reporting purposes, the consistency has been divided into four types. Score 1 = normal, firm to soft consistency, 2 = loose and sloppy, 3 = runny diarrhoea, 4 = hard "sheep pellets". Note also if there are any other aspects of importance i.e. do the faeces have a putrid smell, are they an unusual colour, do they contain any blood?

**Urine**

Changes in the appearance of urine can sometimes provide some useful information. If the urine is thicker and darker than usual this will suggest that the animal is dehydrated. If the urine is "port wine" coloured and the animal is feverish and depressed then this may indicate the presence of tick fever or other disease conditions.
Other

A general description of the stock is often helpful e.g., all looking well, shiny coats, all panting but not distressed, all hungry, not interested in feed etc. Noting of discharges from nose or eyes is also useful - clear, pussy, smelly etc. Keep an accurate record of illness, treatments and mortalities.

Environmental Observation

Temperature and Humidity

These readings are collected daily (usually by the Chief or Second Officer) on each deck and outside the bridge and can be accessed from the records kept on the bridge. If there are any specific times or areas of the ship which you believe need a special recording because you feel it is excessively hot or for AQIS reporting purposes, ask the Chief Officer.

AQIS requires that temperature and humidity are recorded at least daily with individual recordings of deck temperatures as well as ambient temperatures (outside). Reporting of ambient temperature and humidity must reflect the extremes of the day.

The most effective means of detecting "hot spots" is often by just feeling the pen environment yourself. If you walk into an area, which suddenly feels hotter than other areas, make a note of it and observe the animals in that area more carefully to determine if they are distressed.

Recent research work has suggested that the recording of wet bulb temperatures may be more useful to assist with understanding the level of heat stress experienced by stock. Currently, AQIS require relative humidity be recorded and reported.

Deck Conditions

A description of the conditions of the deck will be useful for monitoring progress on shore. A simple code is to call good, dry conditions as score 1, wetter but not serious floor conditions as score 2, very wet conditions which need cleaning out as score 3.

The presence of ammonia fumes will also relate to the conditions of the deck. If ammonia is noticeable and causes you personal discomfort then it is almost certainly doing the same for the stock. Note if ammonia is present and if so, how strong it is. In most cases high ammonia will coincide with score 2 or 3 floor conditions, which will necessitate cleaning at the earliest opportunity. Record the use of bedding.

Stocking Densities

The stockman will need to know the stocking density regulations in order to participate in the load planning exercise. These regulations are set by the Australian Maritime Safety Authority (AMSA) and vary from time to time and for voyages of different lengths and origins. For voyages where cattle are exported by sea from a port south of latitude 26 degrees south there are special low density stocking rates. These rates are
further divided into two different levels depending on the time of year the export is
taking place to allow for the additional heat stress experienced during the northern
hemisphere summer months (1\textsuperscript{st} of May until 1\textsuperscript{st} of October).

Copies of the current rates can be found in Appendices 2, 3 and 4.

As well as considering the AMSA regulation for density, it is also necessary to
consider other factors that may influence the final density at which animals are loaded.
For example:

- Pregnant females will need additional space
- Fat animals will need more space than animals of the same weight with less fat
  cover
- Short and thickset animals will need more space than tall lean animals of the same
  live weight.
- Cattle with long horns will need more space
- Sick animals will benefit greatly from provision of additional space
- Tired animals will need more space to lie down and rest than fresh stock
- Animals carried on vessels with poor ventilation will need more space than the
  same animals on well ventilated vessels.
- Animals loaded without curfew should receive a higher density than animals of the
  same weight which have been loaded with a curfew off feed and water.
- Very young animals need more space, as they need to lie down to rest more
  frequently.

Animals which are loaded at a density which is significantly above their correct level
will have difficulty accessing feed, be subject to more bullying, sustain more injuries
and disease, lose weight or gain less and have a higher level of mortality than those
penned at the proper levels.

**Ventilation, Temperature and Humidity**

These three elements combine on board ship to become the most important group of
factors influencing the welfare of cattle. Their affects during \textit{long haul} journeys tend to
be more critical as these voyages usually involve \textit{Bos taurus} cattle which are subject
to the shipboard environment for longer periods. This is especially true during the
extremely hot and humid Northern Hemisphere summer months. When \textit{Bos indicus}
cattle are transported in the \textit{short haul} trade, ventilation, temperature and humidity
are rarely an issue unless the vessel experiences mechanical problems with its
ventilation systems.

Ventilation has a high priority for industry research and development with
understanding of the problems of ventilation being constantly improved.

Ventilation has two main purposes. The first is to remove noxious gases such as
ammonia, methane and carbon dioxide. The second is to create airflow past the stock
to assist in the removal of body heat.
Current AMSA regulations state that the air in the cattle hold must be changed at least once every two or three minutes, depending on the height of the ceiling. This equates to between 20-30 air exchanges per hour. Most vessels on the long haul run have air exchanges much in excess of this, with some vessels achieving up to 70 air exchanges per hour.

Airflow can also be expressed in terms of cubic metres per hour and furthermore, this airflow can be directly related to pen area (or the number of livestock through which it passes). This is a more direct measure of ventilation efficiency. Vessels achieving 150-200 cubic m/hr/sqm of pen area (45-60 air exchanges per hour), with well designed delivery and distribution systems are well equipped to deal with most of the conditions normally encountered.

Temperature and humidity constantly interact to affect the animal’s comfort. A ‘Temperature and Humidity Index’ is included in the Appendix 5 to demonstrate this relationship. A common threshold point for the commencement of animal discomfort is around 31-32°C and 79% humidity. The same animals will be experiencing severe heat stress at 35°C and 88% humidity.

Whereas this table represents an important reference, recent research has found that the wet bulb temperature may be a better and simpler indicator of when cattle are likely to encounter discomfort from exposure to heat and/or heat stress. It is encouraged that wherever possible, the stockman and ship’s staff discuss heat-related problems with reference to the wet bulb temperature. As a rough guide, unacclimatised Bos taurus animals will begin to experience the first stages of heat stress when the wet bulb reading passes 28 - 29 degrees. Acclimatised Bos taurus will begin experiencing heat stress when the wet bulb reaches 31-32. It is rare for tropically acclimatised Bos indicus cattle to show heat stress at any stage during the voyages undertaken in both the long and short haul trades. In these animals, heat stress is only likely to be seen under rare and exceptional environmental conditions or during failures of the vessel’s ventilation system.

The ability of cattle to tolerate heat is affected by many factors. These factors will adjust the wet bulb temperature at which the cattle will experience discomfort. The major factor involved is breed type, however acclimatization (and the conditions experienced in the 2-3 week period prior to shipping) has been found to be of almost equal importance. Large cattle have a smaller surface area compared to their weight and fat cattle will have more difficulty maintaining body temperature than thin cattle of the same breed. Both these factors adversely affect the ability of cattle to tolerate heat.

Cattle will also be affected by the duration of exposure. Cattle have the ability to tolerate a heat load, either as extreme heat over a short duration or mild heat over a longer duration. It is only if conditions continue unabated, and a respite is not offered that heat stress is incurred. Unlike land, where temperatures can be expected to drop considerably during the night, the maritime environment is remarkably constant and the opportunity for respite through a significant temperature drop reduction is often not forthcoming.

Air speed is another important factor to be considered. Ventilation systems that allow for significant jetting of air over the surface of the cattle will allow cattle to tolerate a higher wet bulb temperature without experiencing discomfort than systems relying on
more passive movement of air. Ventilation system design is especially important to ensure that all cattle pens receive equal levels of air flow. Even in some of the newer vessels with total air exchange rates which far exceed minimum requirements, some individual pens or areas may still have inadequate air flow. This will lead to hot spots on vessels that otherwise exceed AMSA and industry standards.

Although heat stress is the most likely problem you will encounter, cold stress can also be very dangerous to cattle. Care should be taken when considering washing down the decks with very cold water, (eg Southern Australian, North African, Japanese and Chinese waters during winter). Very cold water may be more stressful and dangerous to stock than delaying cleaning for a few days until the vessel reaches warmer waters. If washing can’t be avoided, ensure the crew keeps the splash of cold water onto the cattle to an absolute minimum.

Fast moving air can also be a hazard if the temperatures are low. In the event you are faced with a dramatic reduction in temperature, discuss the options for reducing the air speed with the Master.

The animal regulates the rate at which heat is transferred by dilating or constricting the peripheral blood vessels and altering the circulation to the outer areas of the body. This will result in changes to the temperature of the skin. Cattle seeking to retain heat will often have skin temperatures up to 10ºC lower than normal body temperature, whereas animals seeking to release heat may have skin temperatures a full 3ºC higher than normal body temperature.

Ordinarily, heat is transferred to the environment by convection, conduction and radiation. This is particularly the case where there is a big difference between the temperature of the environment and the body temperature of the animal.

As environmental temperatures approach (or exceed) their body temperature, convection, conduction and radiation are unable to achieve sufficient heat loss and the animal is obliged to utilize evaporative cooling to achieve the heat loss required. Evaporative cooling is achieved during respiration and by sweating. Sweating, provided there is sufficient airflow, accounts for the major part of evaporative cooling in cattle, whereas sheep which use the surfaces of the lungs and upper respiratory tract as the major site of evaporative cooling. Sheep utilize panting to create air movement across the required surfaces whereas cattle depend on airflow across the skin surface to assist in heat removal. Sheep will start panting at a much lower temperature than cattle.

*Bos indicus* infused cattle have a much greater tolerance to heat. They have shorter coats and thinner skin. They have a greater surface area due to their additional skin folds, particularly in the area of the brisket. They have a greater number of sweat glands per unit area of skin and a greater ability to increase their peripheral blood flow. These factors greatly enhance their ability to lose heat through the evaporative cooling mechanism.

*Bos taurus* cattle have thicker and longer coats, thicker skin and a lesser ability to effect changes in the skin that enables effective heat loss. The presence of excessive fat layers in the skin of both *Bos indicus* and *Bos taurus* cattle inhibits the effectiveness of heat loss mechanisms. It is not uncommon for long haired *Bos taurus*
animals to develop thick layers of mud and manure on their coats. This can further reduce the animal’s capacity to lose body heat.

Warm-blooded animals generate surplus energy as part of their normal metabolism. In the most part, this is discharged as body heat. Think of cattle on board a ship as individual heat radiators. Cattle loaded at a higher density will produce more heat in a given space. In addition to this, cattle that are required to acclimatize quickly may in fact produce more heat than cattle that are allowed to acclimatize over a longer period of time. The amount of heat generated by an animal is the result of a complex balance that is influenced by the major body hormones and linked to the basic metabolic rate. Adjustment to this balance is slow (in the order of 7 days to 3 weeks) and cattle that are taken say from Portland in the Southern winter to the equator in 8-10 days may not have had sufficient time to adjust resulting in excessive heat production.

Management activities such as washing, should be planned around the approach to known geographic hot spots such as the equator, the Gulf of Aden, the area of the Red Sea approaching Jeddah, parts of the Persian Gulf and specific ports such as Muscat.

Washing down has a significant effect on humidity. Whereas washing will often be accompanied by increases in relative humidity levels, it also has a cooling effect by removing heat from infrastructure and bedding. As a result there may be little discernable difference in the wet bulb temperature during the course of the washing event. Conditions after washing, however, are often much improved, especially after the distribution of new sawdust. The washing event also appears to have a direct cooling effect on the cattle due to the action of the water on the peripheral blood vessels of the legs and extremities. This appears to offer a real respite to cattle and alleviates some of the heat load.

Recent research has indicated that under certain circumstances, wetting of cattle can alleviate the detrimental affects of heat stress. Wetting should be undertaken when animals are experiencing severe heat stress (drooling, respiration rate greater than 120 per minute, open mouth panting and tongue out. Cattle may also appear agitated, have a hunched stance and have their heads down).

Guidelines for wetting

- Either sea or fresh water can be used
- Water should be applied to the head and back of the cattle and enough water needs to be applied so that it is beginning to run of their backs and down their sides
- Do not apply cold water (less than 25 degrees C) to the head of cattle with severe heat stress as the cold shock may kill them
- Do not use high pressure water jets on cattle as this may cause injury. If high pressure hoses must be used, the nozzle should be set to fan the water
- The duration of the wetting will depend on the volume from the hose, water pressure and the pen stocking density
- At all times ensure that there is normal air movement for the pen or deck – if the ventilation system fails – DO NOT WET CATTLE.
• It is recommended that cattle with severe heat stress are not moved.
• Under moderate conditions one short wetting may be effective for up to 24 hours
• Under severe heat stress wetting should be continued until the severe heat conditions has passed
• Ensure drainage is effective and bedding is changed once it becomes sloppy
• Positive effects including reduced respiration rates and character should be noted soon after wetting commences

Some pregnant dairy cattle have been noted to commence lactation during long haul voyages even though they are not about to have a normal calving or an abortion. Recent research suggests that this is not due to heat stress factors but probably associated with plant oestrogens in the shipboard pellets. Appendix 19 provides a flow chart to assist with diagnosis and treatment of the problem. Essentially, the key is to determine if the udder swelling is due to infectious (mastitis) or non-infectious causes. Intramuscular injection treatments are recommended rather than attempting to use intramammary products. A list of suitable antibiotics is provided. The usual TLC applications including clean bedding and additional space are also recommended. Cleaning out the pens by shovelling may also reduce the amount of faecal material splashed up onto the udder surface. Treatment of teats with teat dip may also assist to reduce the chance of infection entering the udder.

It is of utmost importance that stockmen are aware of the prevailing weather conditions when approaching known geographical hot spots. Many vessels are susceptible to the re-ingestion of exhaust air when subjected to a following breeze that equals the ship’s own speed. These conditions are quite prevalent whilst on the approach to the equator or in the Persian Gulf. It is the responsibility of the stockman to be aware of this potential effect and monitor the resulting fresh air quality being provided to the lower holds. Some vessels will have similar problems with light cross breezes and conditions will often deteriorate on the lee side of open decks. Again the stockman should be aware of the peculiarities of the vessel. Speak to the Master and Chief Officer about these issues.

‘Hot spots’ occur within some vessels. Hot spots are rare on vessels that have properly designed delivery systems. ‘Converted’ vessels, especially those that rely on air to be distributed from the sides of the vessel only, can sometimes struggle to eliminate ‘short circuiting’ effects that leave some areas with little or no airflow. There is generally a good reason why hot spots exist. Sometimes it may be that the ceiling is subjected to direct exposure to the sun or that the area is directly adjacent to a poorly insulated engine room. Other times the reason may be less obvious and the hot spot may appear and disappear at different times of the day or they may move about a deck as air movement patterns are altered by changes in the prevailing weather conditions.

Efforts to rectify hot spots in one area generally create problems elsewhere on the deck (or vessel) and often it is better to manage these areas rather than try to solve them. Careful attention should be paid to stocking densities in these areas.
Where possible, avoid handling animals during heat stress periods, as the exertion involved may be enough to kill them. Heat stress occurs when the animal’s heat loss mechanisms fail to control their core temperature. At this point all the peripheral blood vessels are fully dilated, sweating is profuse and respiration is either very rapid and/or laboured. Because so much blood is now being pumped to the extremities, the amount returning to the heart is becoming limited and the animal is suffering from a ‘lack of venous return’. The animal now faces a difficult dilemma. If it continues to pump more blood to the extremities it is likely to suffer a heart attack due to a shortage of blood returning to the heart. If the animal maintains its blood pressure by returning more blood to the heart, the excessive heat may ‘cook’ the heart and other vital organs. In this case the animal may either die immediately due to a heart attack or two to three days later due to organ dysfunction and/or toxins produced by the extensive organ damage.

It is important to note at this stage that any additional stress when the animals are dealing with a heat stress situation can invoke the flight or fight reflex in which blood is pumped to the skeletal muscles. This aggravates the problem of reduced blood flow to the heart as discussed above and can have the effect of quickly tipping the cattle ‘over the edge’ and induce a dramatic heat failure. Some of the deaths associated with the washing event are thought to be caused by this response. Handle all cattle carefully and gently during periods of heat stress.

**HOT STUFF**

MLA / Livecorp consultants have produced a software program called Hot Stuff which estimates the risk of heat stress occurring during sea transport to enable both exporters and shipping company personnel to be able to ascertain a survival rate for livestock given voyage, vessel and livestock details. All vessels in the trade have had their ventilation systems evaluated with the details stored in a database. Weather conditions of locations along the voyage routes and destinations are also stored in the database. The model uses this information as well as departure port, month of departure, destination, deck number, breed, weight, fat score, coat thickness and acclimatisation details to produce an estimate of mortalities given these specific conditions. If the model indicates that the mortality rate may exceed acceptable levels then modifications must be made to the proposed voyage until the mortality estimates are less than the threshold levels. In most cases this will be achieved on individual voyages by reduced stock densities.

**In the event that animals are experiencing heat stress, possible options to improve the situation include the following:**

If there are only a few isolated hot spots then those pens affected should have some cattle removed to reduce the density. In severe cases the pens may have to be left completely empty.

If the problem is isolated to temperate cattle (*Bos taurus*), then these can be given a lower stocking density by spreading them out and increasing the density of tropical cattle (if there are any on board).
Portable fans can be of considerable benefit for small hot spots.

Ensure easy access to plenty of water. Where cattle rely on small drinkers it may be necessary to utilize hand watering, as feed troughs become available. Stressed cattle can sometimes sulk and fail to keep fully hydrated. This can aggravate the heat stress problems described earlier. Providing easy access to water is an important precaution, especially when bedding conditions make it difficult to move around the pens. In extreme heat stress conditions it may be appropriate to tip out the fodder and fill all available troughs with fresh clean water.

Individual animals demonstrating severe stress may benefit from a treatment with anti-inflammatory drugs (eg Finadyne). Electrolytes can be provided to cattle to assist their level of hydration.

Utilize any spare spaces to create additional cattle pen area e.g. Use any empty sick pens, laneways or storage areas which are safe enough to hold stock, but be careful not to compromise important management procedures. Fronts of pens can be removed to include the laneway space in the pen for short periods. Removing subdividing gates between pens will significantly increase the space available in the pen. Never take these steps without discussing the matter with the Master or Chief Officer first.

In the case of top deck hot spots, the deck can be shaded with tarpaulins or fodder and if necessary the deck can be sprayed with water to cool it down.

In cases where the vessel encounters very hot and humid conditions with following winds it may be appropriate to change course to search for cooler conditions. This applies in particular to open decks with no additional mechanical ventilation. Discuss this option with the Master. In vessels with open decks that have ‘closed’ fronts (or closed backs), very slight course deviations may make a large difference.

Ask for weather forecasts to indicate how long the hot period is likely to persist as this may assist in planning the most appropriate response.

Speak to the Master or Chief Officer about any possible mechanical or ventilation management solutions to the problem. Ensure that all intake and exhaust fans are operating and that there are no obstructions or problems that have been overlooked.

Avoid emptying fouled drinking water onto the decks. Ask the Master to instruct the crew to carry the water outside for emptying into the sea or directly into bilges.

During periods of extreme temperature and humidity it may be of benefit to temporarily reduce fodder intake (up to 50%). Cattle will often do this voluntarily under extreme conditions.

Wetting cattle as described earlier is a possible option.

**Decks and Bedding**

The management of bedding and cleaning is a constant compromise between allowing a build up of soft, relatively dry faeces to provide a comfortable pad for the cattle to lay down on and a need to remove loose, wet faeces and urine which discourage animals from lying down, produce ammonia and contribute to increased
humidity. The most appropriate management of the deck may vary from day to day and needs the careful consideration of all concerned in order to design a regime, which provides maximum comfort for the animals onboard. Research initiatives are currently under way to learn more about the management of ammonia on livestock vessels.

The issues relating to the decks and bedding are clearly much less critical on short haul voyages. As the majority of stock transported in the short haul trade are tropically adapted animals, bedding is usually only used for special categories of stock which require additional care such as pregnant dairy cows. The majority of short haul voyages do not use bedding of any sort. Policy regarding deck washing on short haul voyages varies considerably depending on the exporter, stockman and shipping company’s individual experiences. No single management method is considered to be the most appropriate on short voyages. Good results are obtained from a range of approaches which include some voyages where no deck cleaning is done to those where decks are thoroughly washed every day. The decision on deck management for short haul voyages should be a matter for all of the parties involved to decide based on the individual circumstances faced during each voyage. The same general principals as described below are true for both short haul and long haul. The information in this section should all be considered before deciding on a specific course of action.

The AQIS regulation requiring all long haul voyages to load sawdust or other bedding material has proved to be a major advantage to bedding management and overall animal comfort.

A number of bedding materials has been trialed including hay, straw, wood shaving, rice hulls and sawdust. Sawdust seems to be the most favoured of the alternatives. Wood shavings and straw which generally have longer fibres, have caused some bilge pumping systems to block up.

Sawdust provides the animal with a comfortable, non-slip pad immediately. When faeces and urine drop onto it, their moisture is partly absorbed into the sawdust and the bedding / deck stays drier for longer. Cleaning is only indicated if the bedding conditions become wet or the ammonia levels high enough to warrant a full clean out.

The general aim of the bedding exercise is to clean the deck the least number of times during the voyage while maintaining animal comfort and preventing the build up of ammonia gas.

Washing down distresses cattle and causes them to move around the pen in such a way as to increase the possibility of death or injuries either to themselves or the animals they crash into or step on. Obviously reducing the level of this type of activity to a minimum will also reduce the opportunities for deaths and injuries. This becomes even more important in rough weather and when the cargo includes particularly fragile animals such as pregnant females.

As an additional aid to the control of ammonia gas it may be possible to keep the levels of this gas production under control to some extent by the application of mild acids such as Acetic or Citric acid. These can be mist sprayed on the bedding pad to neutralise the ammonia (2% acid misted twice per day can significantly lengthen the periods between washing out).
Recent research has shown that dietary additives have the capacity to acidify the urine which has a similar result as spraying the bedding with weak acid – ammonia release is reduced. More research needs to be done to clarify the best options for this approach. Another approach to reducing ammonia is to add gypsum to the sawdust bedding at an inclusion rate of 50%. While this has proved effective in reducing ammonia release, the effectiveness is reduced at high temperatures so dietary additives are likely to provide the most practical solution.

As mentioned in the previous section on temperature and humidity, the cleaning of wet decks contributes in the short term to an increase in humidity in the cattle space but subsequently results in a net reduction. The magnitude of this reduction in humidity is dependent on the effectiveness of the deck drainage. If the decks remain wet or have significant puddles of water lying in low areas after the wash then any favourable affect on humidity will be reduced. Placing sawdust or other bedding materials in the wet patches will result in a significant reduction in the humidity in the immediate area. If this is practised over the whole deck the net reduction in humidity can be dramatic.

Cleaning events should be planned to take the passage through hot locations into account. i.e. when approaching the equator or the Gulf of Aden, cleaning should be programmed to allow for the lowest humidity following the cleaning process to coincide with the passage through the hottest locations.

If the vessel’s ventilation is adequate, the decks are well drained and sawdust is available to treat any wet spots then washing out during passage through hot locations may be appropriate. This is something, which should be considered very carefully by all parties before being undertaken.

One option for cleaning the deck without hosing is to simply shovel the accessible faeces from the floor of the pen or alleyway into wheelbarrows and remove it to the bilges or throw it overboard. While this will be less effective than hosing the pen and represent more work for the crew, it will reduce the fouling of the floor with much less stress to the stock and will immediately reduce humidity especially if accompanied by the application of sawdust. This option may be most appropriate for pens containing sick or particularly stressed animals.

The use of sawdust has been suspected of increasing the number of eye infections on some vessels. There is a possibility that hosing down the decks causes sawdust particles to lodge in animal’s eyes thus initiating these infections. This should be considered when cleaning out sawdust bedding with a view to minimising the splashing of the deck wash into the faces of the stock.

On some vessels where stocking densities are quite low, e.g. pregnant dairy cows on long haul voyages, the stockmen and crew have been able to redistribute animals prior to cleaning in order to produce an empty pen. After the empty pen has been cleaned out by hosing or shovelling, the animals in the next pen are moved in and the process repeated for the entire deck. This allows cleaning to take place in only empty pens. Once the cleaning event has been completed then the animals are redistributed again to utilise all of the space on the deck.

Hosing the decks down with very cold seawater can be a dangerous and stressful event for warm cattle. Regardless of how careful the crew is, the cattle will still be sprayed to some extent with the cold water. Cold shock has the same capacity as heat...
stress to result in the development of an outbreak of pneumonia or other stress induced illness. Any attempt to clean the decks by hosing with very cold seawater should be delayed until the vessel reaches warmer waters.

**Fodder and Feeding**

Although the stockman will have no control over the type of fodder loaded by the exporter he does have a major role to play in the management of the feeding arrangements throughout the journey.

AMSA and AQIS have set legal requirements to define the minimum amount of feed loaded onto the vessel. In summary, these requirements are 2% of body weight per day plus 3 days (or 20%, whichever is less) additional feed for contingencies. Minimum feed loaded rises to 2.5% in the case of cattle and buffalo under 250 kg, breeding heifers and pregnant cows. The ASEL standards describe the minimum protein and energy levels of the feed.

The daily feed requirement per head can be calculated using the following formula:

\[
2\% \text{ of body weight} = \frac{2}{100} \times \text{body weight} \\
\text{eg } \frac{2}{100} \times 400 \text{ kg} = 8 \text{ kg per head per day}
\]

For a voyage with 1,500 head of cattle of average weight 400kg that is expected to take 7 days, the feed loaded will need to be:

\[
8 \text{ kg per head per day} \times 1500 \text{ head} \times 7 \text{ days} = 84,000 \text{ kg or } 84 \text{ tons.} \\text{In addition there needs to be 20\% extra loaded as per the AMSA standards 84 tons + 20\% = 84 + 20/100x84 = 84 + 16.8 tons = 100.8 tons.}
\]

Once the voyage has commenced it is the stockman's responsibility in conjunction with the Chief Officer to manage the fodder distribution to ensure that the animals receive adequate feed and that the fodder supply is budgeted to last for the entire voyage. This will entail recalculating the amount of feed left and the quantity needed for the remainder of the trip at least once every day.

The aim of the feeding on board is to recapture lost gut fill due to recent transport rather than attempting to gain real weight. What will often happen is that cattle will be weighed onto the ship with a relatively empty gut, which then fills over the journey producing a "weight gain" of up to 5%. This is only gut refilling, not body weight gain as such. Real weight gain on board ship has the capacity to exacerbate temperature problems, as animals which are gaining weight will generate significantly higher levels of body heat than those which are maintaining. This additional heat, especially during long haul voyages into the northern summer can be enough to turn a very hot environment into a potentially lethal one. Short haul voyages only have the capacity to recover gut fill as their average length is usually only 5 days. Despite the longer duration of Middle Eastern and South American voyages it appears that most animals are still only able to recover their lost gut fill before discharge at the port of destination.

Storage of feed is an issue frequently overlooked by the crew. As most trips will encounter rain at some time or other it is essential to check on the arrangements made by the crew to cover the feed. You will frequently find that either the tarpaulins are not adequately tied in place or that bags of feed are used as weights to hold the tarps down (See picture below). Once fodder is spoilt by water it will go mouldy and be
unsuitable to feed to the stock. Even if they will eat it (and this is unlikely) mouldy feed is extremely dangerous and should not be fed. The only useful role for mouldy feed is for bedding if the primary source has run out. As the end of the voyage approaches and the animals are eating to their full capacity every bag of feed left on board will be vital to ensure that the animals are discharged at their optimal weight.

Always be on the lookout for other forms of feed contamination. Whenever feed is not eaten in the normal pattern, examine the remainder closely for contaminants such as fuel or chemicals. If you are concerned that this may be a problem at least save this feed till last and try not to use it unless there is no other alternative. Also try a small quantity on a few animals initially to determine if there is any danger to the stock.

Contamination of feed in the trough with faeces is an important problem for feed consumption. One of the main jobs for the crew and the stockman is to check the feed troughs frequently and remove faeces and contaminated feed during routine inspections. Cattle are very fussy about this; even hungry cattle will not eat feed, which is contaminated by or close to a dung pat in the trough.

Fibre is essential for the physical process of digestion in the rumen. When fibre is lacking and feed has high levels of small particles or “fines” it is not uncommon for animals on this diet to develop bloat. While this form of bloat can be life threatening, it is not as deadly as the kind seen on clover pastures but will usually result in reduced appetite and weight loss in a proportion of the cattle. As pellets are too small to contain suitable fibre length (about 1 cm is the minimum needed) they are the most common cause of bloat on board. To counteract this problem simply feed the animals some chaff or hay. Even quantities as small as 1/2 or 1 kg per day seem to be adequate to correct the problem. Cubes are usually large enough to provide adequate fibre length but suffer from their inability to be managed easily in shipboard silo/auger systems. Chaff or hay is ideal for balancing the pellet diet with suitable fibre.

ASEL state “Fodder for cattle exported from an Australian port south of latitude 26 degrees south must include at least one (1) percent of the required feed as chaff and or hay.”

Bloat is rare on short haul voyages as, regardless of the type of fodder, the animals will usually carry enough roughage in their rumens to maintain normal digestion for the duration of the 5 day voyage.
Hay or chaff is usually only loaded on short haul vessels to encourage certain groups of stock to eat more quickly. As an example, mature slaughter cows may be stimulated to eat considerably more of the ship’s ration of pellets or cubes if they are provided with a small supplement of chaff or hay.

Appetite on board is affected by a large number of factors. As a general rule, animals which have not been accustomed to the ship’s feed prior to loading onto the vessel will take a number of days until they are able to consume their maintenance volume. In the majority of cases intake will be only 1/4 to 1/3 of full intake on the first day. From the second till the fourth or fifth day, consumption will gradually rise to the full consumption level. Eg. @ 400 kg live wt x 2% = 8kg. While cattle will be able to eat more than this, 2% is adequate for maintenance.

Feeding patterns are the subject of considerable debate. At the present time there is not enough hard evidence to support any one feeding pattern although it is probably safe to say that different feeding arrangements are appropriate under different circumstances. The basic rules to be guided by are:

- Cattle are usually fed twice per day with about 50% fed first thing in the morning and 50% mid afternoon.

When smaller feeds are being delivered eg. During the first few days, it may be appropriate to feed out only once.

Some companies prefer to provide feed to cattle at all times. This is more commonly practiced during long haul voyages.

Some exporters/stockmen prefer one big feed per day. Others believe three feeds per day are best.

Some prefer to reduce feed during the middle of long haul voyages in order to lift the intake at the end of the voyage and hopefully end up with cattle that are fuller on arrival and consequently weigh more over the weighbridge.

Short haul voyages need to focus on speedy gut fill recovery as available time to achieve this is limited. Any means which will encourage animals to eat a greater proportion of their normal daily intake have the capacity to significantly improve the commercial outcome of the voyage.

For those vessels that manually water into troughs, after the feed has been largely consumed, tip the remainder into one of the troughs and fill the other with water.

When budgeting for feed reserves it is generally better to have a substantial contingency supply available at the end of the voyage to allow for problems immediately prior to and during discharge. Once you have arrived in port then you will be able to feed virtually as much as the animals will eat depending on the progress of the discharge. Feeding during discharge can be a touchy issue with importers. As a general rule, the liveweight of discharged animals will increase if they have had constant access to fresh feed immediately prior to discharge. As long as this is not a problem for the importer, (clarify this with the exporter) make every effort to feed (and water) animals during the discharge process. This may involve enlisting crew-members to assist or even employing labour from the wharf to help keep the troughs full. In addition to keeping the troughs full it is important to turn the feed over in the
trough to keep it “fresh”. After cattle feed from a trough for a short period they slobber on the remaining feed and have a tendency to pack it down making it difficult for those feeding next to get the feed out of the trough. Also, feed which has been dribbled on is less attractive to stock than freshly turned feed.

When extremely hot weather is encountered in Egypt or the Middle East it may be an advantage to reduce feed consumption to reduce the amount of heat generated by the animal through normal digestion.

Don’t overfill troughs, as the top layers will simply be wasted as they are pushed onto the floor as the animals eat.

Washing the decks constitutes a stress to the stock so if you have plenty of feed then an additional amount of feed after washing may help the cattle to settle down again.

Sudden reductions in consumption are excellent indicators that there is something wrong and that the cattle are under some sort of stress. This may be heat stress or the sudden onset of a disease problem. Whenever it is observed that a certain group of animals suddenly reduce its consumption you should immediately undertake a close examination of all aspects to determine the cause. Shy feeders are best detected during feeding times.

Shy feeders are individuals that for a variety of reasons eat less than normal. Reasons for this include:

- Bullying by other animals in the pen
- Stress by heat, ammonia gas, disease conditions, bloat, injuries, other...
- Older cows are more susceptible to becoming shy feeders, sometimes without any obvious sign of stress factors except the fact that they are on board the ship in a strange environment.

If at all possible, remove the shy feeders to an area where the cause of their stress is eliminated or reduced. This will usually mean moving them to a sick pen with plenty of room or to another pen where they are the same size as their pen mates. Provide them with ad-lib feed and electrolytes in their water. The use of injectable appetite stimulants such as Coforta have been shown to benefit shy feeders especially on long haul voyages.

**Water and Electrolytes**

Water consumption is a little like the feed intake, slow at first then working up to a fairly constant level. Generally mature cattle will drink around 15 - 20 litres for the first day or so, gradually working up to around 30 - 35 litres. As with feeding regimes there are plenty of opinions as to whether automatic or manual watering systems are better. On balance there doesn’t seem to be much difference except that the calculation of intakes for manual trough type systems is a little harder to estimate as a significant amount of water is wasted when the troughs are emptied due to contamination with faeces. When using manual watering systems don’t take too much notice of the ship’s daily water consumption figures. These will be gross figures only. Make an allowance in your reports for wastage when troughs are cleaned out or accidentally tipped over.
Recent experimental work has demonstrated that heat stress can cause alterations in body electrolytes. Further experiments showed that when animals were provided with an electrolyte replacement mixture in their drinking water treated cattle drank more water, had more alkaline urine and had a weight advantage over non-treated stock. The initial trials showed that the treatment was cost effective. More trial work needs to be completed to determine the optimum nature and dose rate of the supplement. At present the treatment is only recommended for *Bos Taurus* cattle on long haul voyages.

Importers in some ports are very sensitive about electrolyte use in stock they are about to purchase over the weighbridge. Discuss the appropriate arrangements with the exporter but as a general rule the use of electrolytes is recommended for the period of discharge if the circumstances are appropriate. Don’t however “advertise” the fact that electrolytes are being used by leaving empty bags lying around as this may lead to a dispute and delay to discharge.

On some voyages, electrolytes will be available for all the stock for the duration of the journey but this may not always be the case. Where only limited quantities are available they should be kept for use when cattle are experiencing the highest levels of stress. This may be during the equatorial crossing, entering the Red Sea or the Persian Gulf, in individual hot spots, sick pens, for those with diarrhoea or any other cause of cattle stress or dehydration.

Instances have been reported where salt water has mistakenly been provided to the cattle drinking troughs. If you notice that water consumption has stopped completely, taste the water to determine if this is the cause.

When water is contaminated in the ships tanks by rust or other compounds make a note of this in your end of voyage report. Ships with consistently poor water quality will be encouraged to rectify the problem.

In the event that water delivery systems are inadequate for any reason it is essential to ensure that the animals continue to obtain suitable supplies. In extreme circumstances it may be necessary to hand carry water to individual pens. In hot environments it is far more important to provide water rather than feed. If a situation arises where it is not possible to provide both feed and water manually then water supply should receive the highest priority. Animals will live without feed for more than a week but cannot last more than a few days without water when experiencing very hot conditions like those encountered during the summer in the Middle East.

5. **HEALTH PROBLEMS**

**Diarrhoea**

The two main causes of diarrhoea are due to dietary disturbances and infection with disease causing agents.

**Dietary Diarrhoea**

The development of diarrhoea by cattle presented with a new diet is a well-known phenomenon on both land and sea. This form of diarrhoea is the most common cause
of digestive problems on board ships although the overall incidence is not high. The cattle will appear otherwise well but present with a profuse, watery diarrhoea (with a normal smell). Their appetite will generally be normal. In most cases the cause of the problem will be the new pellet diet and this is usually successfully treated by removing the pellets from the diet and replacing with chaff or hay. If the diarrhoea is only mild then the addition of chaff or hay to the pellets may be adequate to return the gut to normal function. Treatment with Probiotics may be indicated if they are available. These are natural bacteria that inhabit the gut which can be given to the animal to assist its gut to return to normal more quickly.

Diarrhoea tends to be a relatively minor problem on short haul voyages as the digestive changes brought about by shipboard feeding have less time to develop over a 5 day shipping period. Pre feeding with shipboard rations is also normal practice.

**Acidosis** is the result of excessive consumption of carbohydrates. On board ship this may be a result of the high grain content of some pellets. The high levels of acid produced from the fermentation of excessive carbohydrate kills off rumen micro-organisms and stops the rumen from functioning. Usually only mild forms of this syndrome are likely to be seen on cattle vessels and only on long haul voyages. In these cases, the rumen movements are reduced but may not be entirely absent. The animals will be off their feed but otherwise bright and alert. Diarrhoea is common. Respiration rate is usually increased. Treatment is by replacement of pellets with roughage. Electrolytes will assist. In rare instances where excessive quantities are consumed the acidosis produced can be extremely severe and result in death.

**Infectious Diarrhoea**

There are two common causes of this type of diarrhoea, Salmonella and Coccidia. Both are usually associated with stress factors acting on southern Australian cattle during long haul voyages. Infectious diarrhoea is very rare on short haul voyages.

**Salmonellosis** is a bacterial disease, which can cause diarrhoea and general illness. The faeces will have a putrid smell and may contain blood. The animal will usually have a fever, be obviously sick and off its feed. In severe cases the animal may die quite quickly while the majority will have a longer course and will respond to treatment with antibiotics. Treatment of choice is Trisoprim (Trimethoprim and Sulfadiazine) and electrolytes. Diarrhoea powder may also be of use.

**Coccidiosis** is a disease caused by parasites infecting the gut. The cattle will develop very smelly and sometimes bloody diarrhoea but will generally not be as sick as those with Salmonellosis. The animals will usually have no signs of fever. Affected animals will frequently strain to pass further faeces. They will go off their feed and lose weight over the voyage. Deaths will be uncommon. Treatment of choice is with Sulfa drugs which are included in Trisoprim.

**Bloat**

This problem is most frequently seen on vessels feeding small pellets especially if the storage system uses silos and augers, which tend to increase the level of pellet dust. Bloat is rare on short haul voyages. The cause of the bloat is the presence of fine particles in the rumen and shortage of fibre which disrupts normal rumen function
leading to the formation of foam. This foam makes it difficult for the animal to burp gas effectively and so causes the signs of bloat. While it tends not to be as life threatening as clover type bloat, it does cause reduced appetites and hence inferior performance of affected animals. Treatment is by the addition of chaff or hay to the diet. When individual cases become serious, the use of oil administered via stomach drench or a trocar to lance the distended rumen can be used. Where dietary changes are not possible, the use of bloat treatment chemicals (Teric Bloat Liquid) applied to the water will help. These treatments can also be applied to the sides of the animals where they lick it off themselves.

Wounds and Injuries

The most common injuries and wounds will be of the lower limbs, usually sustained during loading or through misadventure in the ship’s pens. The animal will usually be in considerable pain and stress placing it at a disadvantage in its pen when competing for feed and water. The standard treatment is to transfer the animal to a sick pen with more space, electrolytes in the water and softer bedding i.e. TLC (“Tender Loving Care”). Treatment with antibiotics (Long acting tetracycline or penicillin) in the case of open wounds and anti-inflammatory drugs to relieve pain and swelling is recommended. The long acting antibiotics may need to be repeated after 3 days but the anti-inflammatory products can be repeated up to twice per day if necessary. Antibiotics are always indicated on long haul voyages, as even if the injury is not likely to become infected, the stress of the injury will predispose the animal to pneumonia and other illnesses. In the case of short haul journeys, treatment with anti-inflammatory drugs alone may well be adequate.

Long acting penicillin may not have the same broad spectrum as oxytetracycline, however it has a lower dose (20 mls) and is much less painful than oxytet. For very stressed animals with a simple wound, penicillin may be the best choice. Where the skin has been broken, the wound area should be treated with topical antibacterial products such as Defiance S or Cetrigen. Electrolytes are recommended for all animals in sick pens as well as ad lib fodder.

Keep an eye out for ‘hairless tails’, as these can be a good indication that the animal has spent a considerable amount of time down and had the hair trodden off the brush. Take extra time to observe these animals very carefully to determine if they have a problem.

Hip Haematomas are the large “fluid filled” lumps seen in the pelvic area especially the points of the hips. While they feel as though they are filled with fluid that could be easily drained, they are in fact filled mainly with gelatinous blood clot material.
They are usually not painful to the animal and are best left alone. DO NOT attempt to lance and drain them. You will get very little fluid out and stand an excellent chance of introducing infection leading to the formation of an abscess. If they do appear to be painful then anti-inflammatory treatments are indicated.

**Swollen Legs** This condition is seen more frequently on long haul voyages especially during rough weather, where deck conditions are poor or where cattle have soft feet. While the cause of this problem is not completely understood, it seems likely that infection has entered the leg either through foot abrasions or minor lower leg wounds. These wounds may not be obvious. The leg (often more than one leg) is hot, swollen, very painful and the animal will often be obviously sick and off its food. Standing up and moving about the pen will be difficult and painful. The recommended treatment is with antibiotics, anti-inflammatory drugs, isolation with more space, soft bedding, plenty of feed and electrolytes. If the animal is unable to move to a sick pen then remove healthy animals from its pen to reduce the pen density and the likelihood of other pen mates standing on or tripping over it.

**Broken Horns** These can be quite painful. If there is a crush on board it may be best to remove the horn completely. Regardless of horn removal, the animal should be provided with some form of pain relief, given additional space to feed and the horn treated with topical wound products.

It is important to remember that in some long haul ports, especially Adabiya (Egypt), lame, sick and injured animals will be rejected during the Quarantine arrival inspection and prevented from discharging. This should be taken into account when deciding on treatment options for those animals which are likely to be rejected. Unless you think that the animal has a fair chance of recovery by the time the vessel is due to discharge then destruction may be the best option for the animal's sake. If significant numbers of animals are involved then communication with the exporter and veterinarian is essential.

In some ports emergency slaughter of sick and injured animals is permitted. Where this is the case, these animals should be discharged first, if possible, to reduce the time they are suffering.

Bulls or fat heifers may ride each other repeatedly resulting in the wearing away of the forward part of their hind claws. This can be difficult to stop and may lead to significant numbers of animals developing very severe lameness. In some cases it may be best to remove the animals, which are being ridden. This may simply lead to a new animal being selected. An alternative is to isolate the animal doing the riding but if there are a few there will soon be no space left to keep them separate. The simplest response to
minimize foot damage is to put additional sawdust or other bedding materials into the pen to stop the toes coming in contact with the steel or concrete deck surface.

Pneumonia

This is one of the more common and serious disease conditions seen on long haul cattle voyages. It is almost always associated with some form of stress placed on the stock, especially hot environmental conditions and poor ventilation. The disease can present in a wide range of forms from sudden death with no other signs to chronic poor doers with low-grade lung infections and abscesses. Any form of pneumonia is quite rare on short haul voyages.

Acute pneumonia will best be diagnosed on post mortem. The animal will often have blood and white foam discharging from the nostrils. When the chest cavity is opened up, the lungs will be dark red and have a solid appearance like a liver. The chest cavity may contain bloody fluid and the heart will be covered in haemorrhages.

The less acute cases will present with nasal discharges of various types from cloudy mucus to creamy / yellow pus. The animal may have a fever and will generally have a faster respiratory rate than those pen mates that are not affected.

Treatment with antibiotics, preferably Micotil (Tetracyclines or Trisoprim are OK as a second choice) and non-steroidal anti-inflammatory compounds (Tolfidine, Finadyne, Ketoprofen) are indicated. Depending on numbers affected and the cause of the problem, it may be beneficial to isolate affected animals. The most important thing is to try to identify the principal cause of the problem and take action to reduce the stress factors.

As usual, electrolytes, additional space and general TLC are indicated.

Heat Stress

Heat stress is rare in short haul voyages as these journeys mainly involve the movement of tropically adapted stock. In addition, the extreme combination of temperature and humidity encountered in the Middle Eastern summer months are almost never matched in Asia. The comments below relate mainly to long haul voyages and those short haul vessels carrying non-acclimatized southern Australian temperate cattle into the SE Asian monsoonal season.

While heat stress is commonly linked to other disease conditions such as pneumonia, it is certainly capable of killing animals in its own right. This will usually only happen when the heat insult is extreme or delivered over an extended period. Death can be
quite sudden during the heat stress event or take place up to 72 hours later. The signs of heat stress will be obvious if the animals are observed prior to death and have been described in the section on cattle observation and ventilation.

If an animal is found dead and heat stress is a possibility then it is important to try to determine if it was indeed the primary cause or if there are other complicating factors such as pneumonia. Post Mortem signs of death from simple heat stress include a reddening (congestion) of the lungs with small spotty haemorrhages over the surface of the heart similar to the signs of a heart attack. If the animal has been dead for some hours then there will also be a noticeable acceleration of the decomposition of the internal organs. In recently dead animals the internal organs may feel very hot at post mortem.

**Downers**

This group is often the most difficult to diagnose and treat. They will generally be found down in their pens with little or no signs as to the cause. The range of options for consideration include :- simple injury / knocked down and trampled, metabolic disturbances, acute or chronic illness ranging from terminal pneumonia to twisted bowel, infected limbs causing pain and poor mobility, bloat, general weakness due to acute diarrhoea, bullying, shy feeders, fatigue or impending birth.

Animals that become stressed during loading may show signs of Transit Tetany. This condition will be most commonly seen in mature slaughter cows and oxen travelling to SE Asia. They will appear nervous, agitated, tremble violently, become aggressive and charge humans. They will often become so uncoordinated and distressed they will fall over soon after their aggressive behaviour and be unable to rise. Treatment with Calcigol + anti-inflammatories and TLC will often lead to complete recovery.

The treatment of downers will obviously be determined by the primary cause. In the event that no obvious cause can be identified then it is recommended that the animal receive a shotgun mixture of treatments that may cover a wide range of possibilities. This can include long acting antibiotics, anti-inflammatory injections, Calcigol plus (or other mineral and glucose replacement solution), more space and general TLC.

In order to treat the animal it may be necessary to lighten off the pen. If the animal is not able to stand and walk to a sick pen after treatment it is best to keep the density in the pen low to allow recovery with less danger of being trampled or knocked down again. If the animal can walk to a sick pen then isolation with plenty of space to rest without being trampled is best. This will also reduce the danger of the treating stockman being kicked or injured.

If a number of unexplained downers are observed, a post mortem on one or more may shed some light on the problem and assist with the development of treatment options.

Consider the welfare of the animal. If it is not able to rise within 24 hours of treatment and there appears to be no improvement in its condition then serious consideration should be given to humane destruction.
Pink Eye
This is most commonly seen in Hereford, Angus and Friesian dairy cattle. It may occur as isolated cases or as an outbreak. The development and transmission seems to be promoted by dust, areas with fast airflow or in some cases high water pressure cleaning of decks covered with sawdust. It can be contagious. Pink eye is seen only rarely on short haul voyages and usually associated with physical injury to the eye.

Where possible isolate affected cases and treat. Treatment options range from sprays, puffer packs and eye ointments to intramuscular injections. If there are only a few isolated cases and they are very quiet then individual treatment with sprays or tubes of ointment may be the simplest option. If there is a crush on board then Orbenin eye ointment is the preferred treatment. With a crush, injections of tetracycline and Dexapent into the eyelids may be possible. If the cattle are flighty and won't allow treatment into the eye then intramuscular injections of long acting tetracyclines will assist. For severe and painful cases anti-inflammatory injections will also be of benefit (Tolfidine, Finadyne or Ketoprofen).

An enterprising stockman has created a mixture of glycerine and oxytetracycline powder which when mixed together and squirted from a kitchen trigger spray bottle has proved to be an effective means of getting the product into the eye of a nervous animal. Results to date have been promising.

Sudden Death
This will be one of the most difficult riddles to solve. Unless there have been some signs observed prior to death then a post mortem examination is the only means of shedding some light on the cause. In many cases the PM won't provide any useful answers either. As sudden death is more common on long haul voyages during periods of high temperature and humidity, it is probably fair to say that heat stress is an important trigger for most cases of sudden death regardless of the final cause.

Problems which may result in sudden death include: - acute pneumonia, heat stroke, intestinal catastrophe, acute generalized bacterial infection (septicaemia = blood poisoning), heart attack, neck / spinal fractures, Enterotoxaemia (same as pulpy kidney in sheep), Black leg, acidosis, acute tick fever and poisoning.

If these sudden deaths become numerous and no obvious cause can be determined then communication with shore to assist with a solution is indicated.

Enterotoxaemia  Usually seen in forward condition animals on good diets. Sudden death or sometimes convulsions may be seen just prior to death. Diagnosis on board can be very difficult. Post mortem signs include fluid filled heart sack, haemorrhages on the heart muscle, reddening of some parts of the small intestine. Only seen on long haul voyages.

Blackleg  Likely to be seen only in southern cattle in forward condition on long haul voyages. Sometimes acute lameness, depression and an area of swollen leg muscles will be seen just before death. Post mortem may reveal an area of swollen, bruised and “rotten” muscle. Outbreaks of Blackleg have been seen after large numbers of soft cattle have been injured during severe and extended periods of very
rough weather. Penicillin is the drug of choice but there is usually little warning before animals become sick with death often following quite quickly afterwards.

**Non Eaters / Ketosis / Yellow Liver Syndrome**

Following a severe stress of some sort, some cattle will stop eating. The cause of the original stress may not have been obvious and the non-eater may not be noticed in the pen before it becomes weak and goes down. When the animal is opened up for post mortem examination the rumen will be virtually empty with only a small amount of liquid and a handful of solids. The liver may be pale to bright orange, enlarged and soft. The body will be thin and the internal body fat will be clear and jelly like. In more mild cases the animal will go off its feed and simply look very hollow in the flanks. Some cattle will return to feeding and watering without treatment but the majority will continue to refuse to eat and develop the full syndrome as above. Early detection is vital if treatment is to be successful.

When the animal stops eating, it mobilizes its body fat and this leads to excessive fat deposited in the liver and metabolic disturbances. Treatment is by Dexafort or Dexapent injections, injectible glucose if available, electrolytes, segregation and general TLC.

This syndrome will only be seen on long haul voyages as it takes some time to develop (1-2 weeks). In the case of short haul animals, it can be seen in importing feedlots if the animals remain under stress after discharge. Pregnant animals are much more susceptible to this syndrome.

**Other Diseases**

The categories above only cover the more common problems you may encounter. Below is a list of other conditions you may occasionally be faced with.

**Ephemeral Fever** - “Three Day Sickness" This is a viral fever associated with the tropics during the wet season, hence it is likely to be seen only in the short haul trade during the wet season. Animals will develop a fever, joint pain and go off their feed for about 3 days. Most affected animals will go down and be difficult to get up. The fever is usually quite high and the animals will feel quite hot to the touch. There will generally be a significant number of animals affected. The majority of cattle will recover. Treat with anti-inflammatories. Use antibiotics only if secondary pneumonia or other infections are suspected. It is important to provide additional space in pens with affected animals as they will lay down for extended periods and others in the pen will injure them. This disease is more severe for larger animals such as heavy oxen.

**Tick Fever** - or reaction to tick fever vaccine The location of ticks in northern Australia and the main use for tick fever vaccine in association with the Indonesian protocol means that this condition is much more likely to be seen in the short haul trade. Fever, off feed, depressed, possibly port wine coloured urine (Red Water) and sometimes sudden death. Post mortem signs include enlarged spleen, enlarged yellow and soft liver, dark kidneys and port-wine coloured urine in the bladder. Treatment of choice is Imizol and Tolfidine, but if Imizol is not available, tetracyclines are the next best option. If tick fever vaccine has been used during the preparation of
the stock then Imizol will usually be added to the veterinary kit by the exporter to cover this contingency.

**Prolapsed anus or uterus.** Attempt to replace the prolapse if facilities are available. Depending on the condition of the animal and the discharge port, affected animals may be able to be discharged for emergency slaughter or require euthanasia.

**Ringworm**

This disease has become a serious problem for the live trade of dairy cattle to China. Chinese veterinary authorities reject animals presented for export if they are affected by ringworm. As the disease is quite common in Australian dairy cattle and is spread by the contact experienced when animals are collected and handled in yards it can become a major issue for China shipments. The treatment of choice is imidazole spray on preparations for animal treatment and disinfectant treatment of yards and handling facilities. Treatment may stop the progress of the disease but lesions remain for a long time as the hair needs to grow back before the skin appears normal again. If there is an outbreak during a voyage then the use of the spray treatment will at best stop further lesions from appearing and halt the spread to other stock.

Effective ringworm vaccines are available in Europe and attempts to allow these to be used in Australia are under way.

Northern Australian cattle are often affected by Herpes virus resulting in skin lesions, which end up looking very similar to ringworm. No treatment is given and the lesions resolve over several months. Severely affected cattle are rejected for export. Minor cases are permitted to travel.

Buffalo Fly scars can also cause rejection problems with the quarantine vets in Egypt.

**IBR** is a respiratory tract virus causing fever, depression, **clear nasal and eye discharge**, nasal ulcers with possible complication by secondary bacterial pneumonia. This is likely to be seen only in the **long haul** trade associated with cattle from southern Australia. Vaccines are available for preventative treatment. For onboard cases use antibiotics and anti-inflammatory drugs combined with TLC

**Stomach ulcers** Some animals on **long haul** voyages have been observed to have their fourth stomach ulcerated with gut contents entering the abdominal cavity. This leads quickly to peritonitis and death. The cause of this disease is not clear but may be associated with the feeding of pellets with high levels of "fines".

**Misadventure** This covers a multitude of unfortunate accidents, which can happen to cattle on board ships. They range from the more common fractured limbs when legs are caught in gates or animals jump down ramps from one deck to the next to drowning in the water trough. Leg injuries form the vast majority of this category.

### 6. DISCHARGE

At the conclusion of every voyage it is absolutely essential to be well prepared for discharge to ensure that all the hard work by yourself and the crew is not undone because of poor unloading arrangements.
**Planning**

Convene a meeting with the Master and / or the Chief Officer to plan the strategy for unloading arrangements. Establish the most efficient lines of communication. Confirm what labour will be available and who will be in charge for the various shifts so you know who to look for when support is needed.

**Feed Budgeting**

Collect the best information as to the likely time needed for discharge and budget feed accordingly. Remember that some importers will be requesting (and in some cases personally supervising) feed and water curfews prior to discharge and weighing. As a general rule curfew will be enforced in Egypt but animals can be fed and watered during discharge at all other Middle East and North African ports. Curfew can sometimes be an important issue with some individual SE Asian importers. Ensure that labour is available for feeding as required. **Clarify with the exporter prior to sailing if there are any specific arrangements with the importer regarding discharge curfew.**

Electrolytes used at the time of discharge may assist cattle to maintain their body weight during the trucking and weighing process. Once again, confirm the arrangements for this with the exporter prior to sailing.

**Equipment Check**

Check that ramps, unloading platforms and other vital equipment are in good working order. Check alleyways and gate arrangements to ensure that they are clear and free of troughs, hoses, dangerous protrusions etc.

**Presentation**

Attempt to present the cattle in their best light. Clean out the pens if possible prior to entering the port to reduce manure soiling. Put down remaining sawdust if available to reduce slipping on deck and improve cattle comfort and the appearance of the pens.

**Redistribute Remaining Cattle**

In the case of slow discharges, consider the option to spread remaining cattle into the empty pens to increase their comfort. This will be especially important when weather is hot as the ship is almost always hotter when not moving through the water. Ensure that any such redistribution is first discussed with the Master or Chief Officer to allow him to consider the stability of the vessel.

**Veterinary rejections**

These will be important, especially in Egypt. Take any recovered animals out of sick pens in case they are rejected just because of their location. Make notes of individual animals that are rejected including the apparent reasons. This may be important for insurance purposes. Where emergency slaughter is available, prepare sick and injured animals for discharge first. Destroy and dispose of any animals unlikely to discharge prior to entry to the port.

**Inspect trucks**

Check at least a percentage of the trucks and the loading platform to ensure that they are suitable, have some form of non-slip material on the floor and are free of floor...
holes and sharp protrusions. Don’t be afraid to stop discharge if the trucks, ramp or labour is unsatisfactory. A slow discharge of healthy stock is preferable to rapid progress with numerous injuries, stress and escapes.

Discharging during the Chinese winter presents new potential risks of cold stress for uncovered trucks and poor ventilation for covered vehicles. Monitor progress carefully.

**Escapees**

While you may be able to assist with recapture, remember that your primary responsibility remains the discharge of the main consignment. Rodeo work can be scheduled for after the completion of discharge. A 5 - 10 ml dose of Rompun (Xylazine) delivered from a Westergun can help to slow a beast down enough to capture it safely and return it to the ship or truck. Best to take great care with preventative measures.

**Counting**

The counting of the stock off the ship is usually supervised by the importer/agent and a member of the ship’s crew. Hopefully these two counts match but frequently this is not the case.

**Attendance at the weighbridge**

This is usually the responsibility of the exporter or his agent. It may be necessary on some occasions to assist with this supervision although your principle responsibility is the smooth discharge of the cattle from the ship.

**Always have contingency plans** for delays, feed shortages and other problems.

**Check on your departure flight time** and be prepared to delay if necessary. Keep in touch with the ship’s agent to ensure that your passport has been processed by immigration, secure and ready for collection. Make sure you know where and from whom you can retrieve your passport. You will almost certainly need to produce your passport at the security gate before you are permitted to leave the port.

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**Australian Cattle Exports**

![Graph showing Australian Cattle Exports](chart.png)

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- **FOB Value $m**

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</tr>
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</tr>
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</table>
APPENDIX 1: ASEL Stocking Density Chart – Default Table
Minimum pen area per head for cattle exported by sea

Table A4.1.1 – ASEL Version 2.1

<table>
<thead>
<tr>
<th>Liveweight (kg)</th>
<th>Minimum pen area (m²/head)</th>
<th>Liveweight (kg)</th>
<th>Minimum pen area (m²/head)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Voyages of 10 days or more</td>
<td>Voyages of less than 10 days</td>
<td></td>
</tr>
<tr>
<td>200 or less</td>
<td>0.770 405</td>
<td>1.467</td>
<td>1.459</td>
</tr>
<tr>
<td>205</td>
<td>0.787 410</td>
<td>1.484</td>
<td>1.478</td>
</tr>
<tr>
<td>210</td>
<td>0.804 415</td>
<td>1.501</td>
<td>1.487</td>
</tr>
<tr>
<td>215</td>
<td>0.821 420</td>
<td>1.518</td>
<td>1.505</td>
</tr>
<tr>
<td>220</td>
<td>0.838 425</td>
<td>1.535</td>
<td>1.519</td>
</tr>
<tr>
<td>225</td>
<td>0.855 430</td>
<td>1.552</td>
<td>1.533</td>
</tr>
<tr>
<td>230</td>
<td>0.872 435</td>
<td>1.567</td>
<td>1.547</td>
</tr>
<tr>
<td>235</td>
<td>0.889 440</td>
<td>1.586</td>
<td>1.560</td>
</tr>
<tr>
<td>240</td>
<td>0.906 445</td>
<td>1.603</td>
<td>1.574</td>
</tr>
<tr>
<td>245</td>
<td>0.923 450</td>
<td>1.620</td>
<td>1.588</td>
</tr>
<tr>
<td>250</td>
<td>0.940 455</td>
<td>1.637</td>
<td>1.602</td>
</tr>
<tr>
<td>255</td>
<td>0.957 460</td>
<td>1.654</td>
<td>1.615</td>
</tr>
<tr>
<td>260</td>
<td>0.974 465</td>
<td>1.654</td>
<td>1.615</td>
</tr>
<tr>
<td>265</td>
<td>0.991 470</td>
<td>1.688</td>
<td>1.643</td>
</tr>
<tr>
<td>270</td>
<td>1.008 475</td>
<td>1.705</td>
<td>1.657</td>
</tr>
<tr>
<td>275</td>
<td>1.025 480</td>
<td>1.722</td>
<td>1.670</td>
</tr>
<tr>
<td>280</td>
<td>1.042 485</td>
<td>1.739</td>
<td>1.684</td>
</tr>
<tr>
<td>285</td>
<td>1.059 490</td>
<td>1.756</td>
<td>1.698</td>
</tr>
<tr>
<td>290</td>
<td>1.076 495</td>
<td>1.773</td>
<td>1.712</td>
</tr>
<tr>
<td>295</td>
<td>1.093 500</td>
<td>1.790</td>
<td>1.725</td>
</tr>
<tr>
<td>300</td>
<td>1.110 505</td>
<td>1.807</td>
<td>1.739</td>
</tr>
<tr>
<td>305</td>
<td>1.127 510</td>
<td>1.824</td>
<td>1.753</td>
</tr>
<tr>
<td>310</td>
<td>1.144 515</td>
<td>1.841</td>
<td>1.767</td>
</tr>
<tr>
<td>315</td>
<td>1.161 520</td>
<td>1.858</td>
<td>1.780</td>
</tr>
<tr>
<td>320</td>
<td>1.178 525</td>
<td>1.875</td>
<td>1.794</td>
</tr>
<tr>
<td>325</td>
<td>1.195 530</td>
<td>1.892</td>
<td>1.808</td>
</tr>
<tr>
<td>330</td>
<td>1.212 535</td>
<td>1.909</td>
<td>1.822</td>
</tr>
<tr>
<td>335</td>
<td>1.229 540</td>
<td>1.926</td>
<td>1.835</td>
</tr>
<tr>
<td>340</td>
<td>1.246 545</td>
<td>1.943</td>
<td>1.849</td>
</tr>
<tr>
<td>345</td>
<td>1.263 550</td>
<td>1.960</td>
<td>1.863</td>
</tr>
<tr>
<td>350</td>
<td>1.280 555</td>
<td>1.977</td>
<td>1.877</td>
</tr>
<tr>
<td>355</td>
<td>1.297 560</td>
<td>1.994</td>
<td>1.890</td>
</tr>
<tr>
<td>360</td>
<td>1.314 565</td>
<td>2.011</td>
<td>1.904</td>
</tr>
<tr>
<td>365</td>
<td>1.314 570</td>
<td>2.028</td>
<td>1.918</td>
</tr>
<tr>
<td>370</td>
<td>1.348 575</td>
<td>2.045</td>
<td>1.932</td>
</tr>
<tr>
<td>375</td>
<td>1.365 580</td>
<td>2.062</td>
<td>1.945</td>
</tr>
<tr>
<td>380</td>
<td>1.382 585</td>
<td>2.079</td>
<td>1.959</td>
</tr>
<tr>
<td>385</td>
<td>1.399 590</td>
<td>2.096</td>
<td>1.973</td>
</tr>
<tr>
<td>390</td>
<td>1.416 595</td>
<td>2.113</td>
<td>1.987</td>
</tr>
<tr>
<td>395</td>
<td>1.433 600</td>
<td>2.130</td>
<td>2.000</td>
</tr>
<tr>
<td>400</td>
<td>1.450 600+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Footnote:

a Pen-group liveweight range: the liveweight range in each pen of cattle should not exceed the pen average +/-50kg
b For cattle weighing between 200 kg and 600 kg, for weights between those shown in the table, the minimum pen area per head should be calculated by linear interpolation
c Time from completion of loading in Australia until anticipated arrival at the first port of discharge overseas.
d For cattle weighing more than 600 kg, on voyages of 10 days or more, the minimum pen area per head is 2.13 m² plus 0.017 m² for each 5 kg above 600 kg.
e For cattle weighing more than 600 kg, on voyages of less than 10 days, the minimum pen area per head is 2.00 m² plus 0.014 m² for each 5 kg above 600 kg.
APPENDIX 2: Northern summer adjusted densities

Minimum pen area per head for cattle exported by sea from a port south of latitude 26 degrees south from 1 May to 31 October.

<table>
<thead>
<tr>
<th>Liveweight (Kg)*</th>
<th>Minimum pen area (m²/head)</th>
<th>Liveweight (Kg)*</th>
<th>Minimum pen area (m²/head)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 or less</td>
<td>0.847</td>
<td>305</td>
<td>1.240</td>
</tr>
<tr>
<td>205</td>
<td>0.866</td>
<td>310</td>
<td>1.258</td>
</tr>
<tr>
<td>210</td>
<td>0.884</td>
<td>315</td>
<td>1.277</td>
</tr>
<tr>
<td>215</td>
<td>0.903</td>
<td>320</td>
<td>1.296</td>
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<tr>
<td>220</td>
<td>0.922</td>
<td>325</td>
<td>1.315</td>
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<tr>
<td>225</td>
<td>0.941</td>
<td>330</td>
<td>1.333</td>
</tr>
<tr>
<td>230</td>
<td>0.959</td>
<td>335</td>
<td>1.352</td>
</tr>
<tr>
<td>235</td>
<td>0.978</td>
<td>340</td>
<td>1.371</td>
</tr>
<tr>
<td>240</td>
<td>0.997</td>
<td>345</td>
<td>1.390</td>
</tr>
<tr>
<td>245</td>
<td>1.016</td>
<td>350</td>
<td>1.408</td>
</tr>
<tr>
<td>250</td>
<td>1.034</td>
<td>355</td>
<td>1.427</td>
</tr>
<tr>
<td>255</td>
<td>1.053</td>
<td>360</td>
<td>1.445</td>
</tr>
<tr>
<td>260</td>
<td>1.071</td>
<td>365</td>
<td>1.464</td>
</tr>
<tr>
<td>265</td>
<td>1.090</td>
<td>370</td>
<td>1.483</td>
</tr>
<tr>
<td>270</td>
<td>1.109</td>
<td>375</td>
<td>1.502</td>
</tr>
<tr>
<td>275</td>
<td>1.128</td>
<td>380</td>
<td>1.520</td>
</tr>
<tr>
<td>280</td>
<td>1.146</td>
<td>385</td>
<td>1.539</td>
</tr>
<tr>
<td>285</td>
<td>1.165</td>
<td>390</td>
<td>1.558</td>
</tr>
<tr>
<td>290</td>
<td>1.184</td>
<td>395</td>
<td>1.613</td>
</tr>
<tr>
<td>295</td>
<td>1.203</td>
<td>400</td>
<td>1.668</td>
</tr>
<tr>
<td>300</td>
<td>1.221</td>
<td>405</td>
<td>1.688</td>
</tr>
</tbody>
</table>

a For cattle weighing between 200 kg and 500 kg, for weights between those shown in the table, the minimum pen area per head should be calculated by linear interpolation.

b For cattle weighing more than 500 kg, the minimum pen area per head is 2.06 m² plus 0.02 m² for each 5 kg above 500 kg.

Note: For shipments that originate or load from a port south of latitude 26 degrees south and take a route that does not cross latitude 15 degrees south, stocking densities will be calculated from Table A4.1.3 regardless of the date of the voyage.

Each Exporter must ensure that the vessel carries no more than the maximum number of cattle calculated by using the table above.

**Calculations for Feed and Water**

**Water Requirements** = 0.12 x weight of animals (kg) x number of expected days on board vessel + provision for 3 extra days

**Food Requirements** = 0.02 x weight of animals (kg) x number of expected days on board vessel + provision for 3 extra days or 20% (whichever is least)
APPENDIX 3: Northern winter adjusted densities

Minimum pen area per head for cattle exported by sea from a port south of latitude 26 degrees south, from 1 November to 30 April.

<table>
<thead>
<tr>
<th>Liveweight (Kg)</th>
<th>Minimum pen area (m²/head)</th>
<th>Liveweight (Kg)</th>
<th>Minimum pen area (m²/head)</th>
<th>Liveweight (Kg)</th>
<th>Minimum pen area (m²/head)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 or less</td>
<td>0.770</td>
<td>320</td>
<td>1.178</td>
<td>440</td>
<td>1.586</td>
</tr>
<tr>
<td>205</td>
<td>0.787</td>
<td>325</td>
<td>1.195</td>
<td>445</td>
<td>1.603</td>
</tr>
<tr>
<td>210</td>
<td>0.804</td>
<td>330</td>
<td>1.212</td>
<td>450</td>
<td>1.620</td>
</tr>
<tr>
<td>215</td>
<td>0.821</td>
<td>335</td>
<td>1.229</td>
<td>455</td>
<td>1.637</td>
</tr>
<tr>
<td>220</td>
<td>0.838</td>
<td>340</td>
<td>1.246</td>
<td>460</td>
<td>1.654</td>
</tr>
<tr>
<td>225</td>
<td>0.855</td>
<td>345</td>
<td>1.263</td>
<td>465</td>
<td>1.671</td>
</tr>
<tr>
<td>230</td>
<td>0.872</td>
<td>350</td>
<td>1.280</td>
<td>470</td>
<td>1.688</td>
</tr>
<tr>
<td>235</td>
<td>0.889</td>
<td>355</td>
<td>1.297</td>
<td>475</td>
<td>1.705</td>
</tr>
<tr>
<td>240</td>
<td>0.906</td>
<td>360</td>
<td>1.314</td>
<td>480</td>
<td>1.722</td>
</tr>
<tr>
<td>245</td>
<td>0.923</td>
<td>365</td>
<td>1.331</td>
<td>485</td>
<td>1.775</td>
</tr>
<tr>
<td>250</td>
<td>0.940</td>
<td>370</td>
<td>1.348</td>
<td>490</td>
<td>1.827</td>
</tr>
<tr>
<td>255</td>
<td>0.957</td>
<td>375</td>
<td>1.365</td>
<td>495</td>
<td>1.880</td>
</tr>
<tr>
<td>260</td>
<td>0.974</td>
<td>380</td>
<td>1.382</td>
<td>500</td>
<td>1.932</td>
</tr>
<tr>
<td>265</td>
<td>0.991</td>
<td>385</td>
<td>1.399</td>
<td>505</td>
<td>1.984</td>
</tr>
<tr>
<td>270</td>
<td>1.008</td>
<td>390</td>
<td>1.416</td>
<td>510</td>
<td>2.035</td>
</tr>
<tr>
<td>275</td>
<td>1.025</td>
<td>395</td>
<td>1.433</td>
<td>515</td>
<td>2.086</td>
</tr>
<tr>
<td>280</td>
<td>1.042</td>
<td>400</td>
<td>1.450</td>
<td>520</td>
<td>2.137</td>
</tr>
<tr>
<td>285</td>
<td>1.059</td>
<td>405</td>
<td>1.467</td>
<td>525</td>
<td>2.157</td>
</tr>
<tr>
<td>290</td>
<td>1.076</td>
<td>410</td>
<td>1.484</td>
<td>530</td>
<td>2.176</td>
</tr>
<tr>
<td>295</td>
<td>1.093</td>
<td>415</td>
<td>1.501</td>
<td>535</td>
<td>2.196</td>
</tr>
<tr>
<td>300</td>
<td>1.110</td>
<td>420</td>
<td>1.518</td>
<td>540</td>
<td>2.215</td>
</tr>
<tr>
<td>305</td>
<td>1.127</td>
<td>425</td>
<td>1.535</td>
<td>545</td>
<td>2.235</td>
</tr>
<tr>
<td>310</td>
<td>1.144</td>
<td>430</td>
<td>1.552</td>
<td>550</td>
<td>2.255</td>
</tr>
<tr>
<td>315</td>
<td>1.161</td>
<td>435</td>
<td>1.569</td>
<td>550+</td>
<td>Footnote^b</td>
</tr>
</tbody>
</table>

^a For cattle weighing between 200 kg and 550 kg, for weights between those shown in the table, the minimum pen area per head should be calculated by linear interpolation.

^b For cattle weighing more than 550 kg, the minimum pen area per head is 2.255 m² plus 0.02 m² for each 5 kg above 550 kg.

Note: For shipments that originate or load from a port south of latitude 26 degrees south and take a route that does not cross latitude 15 degrees south, stocking densities are to be calculated from Table A4.1.3 regardless of the date of the voyage.
APPENDIX 4

Example of Load Plan
APPENDIX 5

Temperature and Humidity Index

### APPENDIX 6

**Recommended Veterinary Kit – taken from ASEL Version 2.1**

**Table A4.1.8  Minimum restraint and veterinary equipment — Slaughter or feeder cattle or buffalo**

<table>
<thead>
<tr>
<th>Restraint equipment</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adjustable head bale should be included (1 per ship)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Rope halter (1 per ship)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Nose grip pliers (1 pair per ship)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Drugs and equipment</strong> (per 1,000 cattle and buffalo)</th>
<th><strong>Voyages of 10 days or more</strong></th>
<th><strong>Voyages of less than 10 days</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injectable antibiotics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>penicillin (short acting)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>oxytetracycline (long acting) or equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anti-inflammatory drugs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dexadresson</td>
<td>30 cattle doses</td>
<td>15 cattle doses</td>
</tr>
<tr>
<td>flunixin or equivalent</td>
<td>30 cattle doses</td>
<td>15 cattle doses</td>
</tr>
<tr>
<td><strong>Topical wound treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sufficient to treat 20 minor wounds</td>
<td>Sufficient to treat 10 minor wounds</td>
</tr>
<tr>
<td><strong>An effective pink eye treatment system</strong> (similar acting to Orbenin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 box of 20 tubes</td>
<td>10 tubes</td>
</tr>
<tr>
<td><strong>Sedative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xylazine</td>
<td>10 cattle doses</td>
<td>5 cattle doses</td>
</tr>
<tr>
<td><strong>Thermometers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 per ship</td>
<td>3 per ship</td>
</tr>
<tr>
<td><strong>Needles</strong> (18G, 1½”) or equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 box of 100</td>
<td>1 box of 100</td>
</tr>
<tr>
<td><strong>Hypodermic syringes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 x 20 mL</td>
<td>20 x20 mL</td>
<td>5 x 5 mL</td>
</tr>
<tr>
<td>10 x 5 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Post-mortem kit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 post-mortem knives plus steel and sharpening stone per ship</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Remotely triggered syringe device</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 syringe plus spare parts per ship, plus 10 spare needles per 1000 animals</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Captive-bolt gun</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 per ship, plus 40 cartridges per 1,000 animals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional drugs and equipment may be necessary if there are other classes of cattle or buffalo in the consignment (eg mastitis treatment and obstetrical supplies for pregnant cows, scour treatments for calves).
APPENDIX 7

Recommended Ship’s Equipment List: Long Haul

Westergun spring loaded syringe. 1 per 3000 head with at least two spare syringes and 2 dozen spare needles per gun. Or equivalent equipment

Ordinary needles and syringes
Post mortem knife, steel, sharpening stone, pruning shears (to cut rib cage)
Rope, Rope halter, nose pliers
Vinyl gloves for post mortems
Bloat trocar and canula
Stomach tube
Citric or Acetic acid for spraying on the decks covered with faeces to reduce the levels of ammonia and suitable spraying equipment
Antiseptic soap for cleaning hands and skin after dirty procedures
Captive bolt (responsibility of the Ship Owner / Master)
Electric Jigger and spare batteries
Plastic cattle ‘cane’
Suture kit including needle drivers, forceps, needles and suture material for stitching wounds

Recommended Ship’s Equipment List: Short Haul

Westergun spring loaded syringe: 1 per vessel with one spare syringe and 1 packet of spare needles.
Ordinary needles and syringes
Post Mortem knife
Captive bolt (responsibility of the Ship Owner / Master)
Electric Jigger and spare batteries
Plastic cattle cane
APPENDIX 8

Stockman’s Personal Check List

Pocket Knife
Calculator
Gum boots or wet suit boots
Torch
Note books - plastic covered pocket books to take into cattle hold
Daily diary
Camera
Thongs
Copy of the Merck Veterinary Manual

Stockman Health Issues

Q fever is a disease caused by a micro-organism which can be transmitted to man from cattle and other animals. Its transmission to man is only associated with breeding female animals. Symptoms in man resemble the flu. Vaccination is available to protect stockmen who are likely to come into close contact with breeding cattle. This vaccination can be arranged by your doctor and is recommended for all stockmen.

Micotil is an extremely dangerous drug for humans. Micotil is classified as a severe allergen because repeated unprotected exposures are likely to cause allergic reactions. Effects of exposure may include changes in the heart rate/rhythm and heart tissue. The drug can enter the body by inhalation, skin contact or accidental injection. Injection of Micotil in humans may be fatal. In the case of contact with eyes or skin, take usual measures of flushing eyes, washing skin and clothes. In the case of accidental injection, prepare to commence artificial respiration and contact medical support immediately.

Rompun, Xylazine (Xylazil) is a sedative, which if accidentally injected into humans will result in respiratory failure and coma. Take extreme care when using this chemical especially if it is being delivered using a Westergun. In the event of accidental injection prepare to commence artificial respiration and contact medical assistance immediately.

Injection with a cattle dose of Xylazil into a human is likely to be fatal.

Most of the other drugs in the veterinary kit are dangerous to some extent or another. Oxytetracycline may not kill you but accidental injection will make you very sick and cause pain that is so acute you may wish you were dead. TAKE EXTREME CARE WHEN HANDLING ALL DRUGS. ASSUME THEY ARE ALL DANGEROUS ESPECIALLY IF YOU ACCIDENTALLY INJECT THEM INTO YOURSELF. REMEMBER YOU MAY BE A WEEK AWAY FROM CONVENTIONAL MEDICAL HELP!!!
APPENDIX 9

Instructions for Euthanasia         Humane destruction

Each exporter must ensure that, when it is necessary to humanely destroy an animal, for example following serious illness or injury:

1. The animal is handled as quietly as possible before being destroyed, to ensure that it is not unnecessarily distressed
2. The number of people involved is the minimum number required to safely and humanely destroy the animal; and
3. The method of destruction causes a sudden and painless death

Each exporter must ensure that humane destruction is carried out with a genuine concern for animal welfare and, where possible, is done using:

1. a captive bolt pistol with a penetrating bolt;
2. a firearm; or
3. an overdose of anaesthetic administered by a Veterinarian.

Each exporter must ensure that a captive bolt pistol is not used to destroy cattle unless the blank cartridge is recommended by the manufacturer for use on cattle.

In the event that the animal to be destroyed is still able to stand and move about, it may be advisable to deliver a large dose (10ml) of Rompun via a Westergun to render the animal unconscious before attempting the use of the captive bolt or other means for destruction. This will reduce the stress of the process to the animal as well as the danger to the stockman.

Each exporter must ensure that, where a captive bolt pistol or firearm is used to destroy cattle:

1. It is aimed at the point of intersection of lines from the base of each ear to the medial canthus of the opposite eye, and directed parallel with the spine (see Figure 1); and
2. The shooter does not fire while the animal is moving its head, but waits patiently for the animal to stop moving before firing.

![Figure 1. Point of aim](image)

"a" Position for temporal method (suitable for firearm only)
"b" Position for frontal method (firearm or captive bolt only)
"c" Position for poll method (firearm only)

Each exporter must ensure that, where an animal is destroyed with an overdose of anaesthetic, the carcase is disposed of so that it cannot be scavenged or inadvertently fed to humans or animals. There may be restrictions on disposal of carcases in certain areas and this is certainly the case in any port.
APPENDIX 10

Travel advice

Before you leave confirm who is paying for your return air ticket and how you will get it on arrival at the port of discharge.

Check that your passport has at least 6 months to run as some countries including Indonesia will not allow you to enter if the expiry is less than 6 months from the time of departure. Double check on visa needs. Once again Indonesia is a tricky one as it requires visas for all entry ports except the major tourist destinations (airports).

Contact LiveCorp to advise their office of your travel plans to ensure you are eligible for the LiveCorp Insurance Cover. You will be provided with an “Emergency Health Card” which you should carry with you at all times when travelling overseas.

Make sure you have paid all-important bills at home before you leave.

Credit cards are an indispensable item when travelling in foreign countries. Don’t leave home without one.

Make photocopies of your passport - leave one set at home and take another set with you on the trip in case the original is lost or stolen. It will also be useful to carry a couple of passport photos in case you need to apply for a visa for an unexpected destination.

Some stockmen travel as crew members rather than supercargo. In this case they are provided with a “Seaman’s Book” which is a sort of passport for sailors. It may assist the holder to obtain visas and increase luggage limits on aircraft. Discuss this option and any current practices with the exporter to make your return journey as simple as possible.

When returning to Australia be aware that in some airports, quarantine will seize any dirty work clothes and destroy them!!! Make sure that you either wash your work clothes before getting onto the plane to go home or dispose of them. Some stockmen leave their clothes on the ship and pay a crew member to wash them ready for their next voyage.

Australian Embassy Contact Numbers

If you get into difficulty in the importing country, speak to the exporter or the ship’s agent. If you have left the ship and are unable to contact either the exporter or the agent, you may be able to get some assistance from the nearest Australian Embassy or consulate.

<table>
<thead>
<tr>
<th>Country</th>
<th>area code</th>
<th>number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>2</td>
<td>575 0444 (Cairo)</td>
</tr>
<tr>
<td>Jordan</td>
<td>6</td>
<td>593 0246 (Amman)</td>
</tr>
<tr>
<td>Israel</td>
<td>3</td>
<td>695 0451 (Tel Aviv)</td>
</tr>
<tr>
<td>Kuwait</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahrain</td>
<td></td>
<td>All these are represented by the embassy in Saudi Arabia</td>
</tr>
<tr>
<td>Oman</td>
<td></td>
<td>in Riyadh area code 1, number 488 7788</td>
</tr>
<tr>
<td>Qatar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MLA has a Middle East office in Bahrain. This office has personnel who can assist with animal health matters. As of April 2008 Peter Dundon is on hand and his mobile number is +973 39 69 70 02. The phone number of the MLA office in Bahrain is + 973 17 22 30 03. Other countries’ or cities’ contact numbers are as follows.

<table>
<thead>
<tr>
<th>Country</th>
<th>Area Code</th>
<th>Number</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thailand</td>
<td>2</td>
<td>287 2680</td>
<td>(Bangkok)</td>
</tr>
<tr>
<td>Guangzhou</td>
<td>20</td>
<td>8335 0909</td>
<td></td>
</tr>
<tr>
<td>Ho Chi Minh City</td>
<td>8</td>
<td>829 6035</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td></td>
<td>2827 8881</td>
<td></td>
</tr>
<tr>
<td>Jakarta</td>
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<td></td>
</tr>
<tr>
<td>Tokyo</td>
<td>3</td>
<td>5232 4111</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td>836 4100</td>
<td></td>
</tr>
<tr>
<td>Kuala Lumpur</td>
<td>3</td>
<td>246 5555</td>
<td></td>
</tr>
</tbody>
</table>

(for local calls add “0” to area code)

Ringing Home
If you have a digital mobile phone, you can automatically find the appropriate international access code wherever you are overseas by pressing the “star” key at the bottom left of the keypad twice. When it is pressed twice, a + sign will appear. Once the + sign is showing, simply follow with the country code (61 for Australia), the area code without the zero followed by the number.

Other Training
It is recommended that each stockman familiarise himself with the following subjects preferably by participating in appropriate training courses:

- First Aid
- The safe use of chemicals - available through 1 day ‘Chemsafe’ courses
- Maritime Safety - courses available in all major port centres.

Most ships will carry safety instruction videos. Take the time to play these presentations as they are easy watching and the information they contain may come in very handy in the case of an emergency.

Stockman Insurance
Confirm with the exporter or LiveCorp that you are eligible for cover under the LiveCorp insurance policy and that LiveCorp have been advised of the details of your voyage. LiveCorp will provide an “Emergency Health Card” that you should carry in your wallet. If the exporter is not a member of LiveCorp, alternative insurance cover should be sought.

The following page details the categories covered in the policy.
CERTIFICATE OF CURRENCY

POLICY HOLDER: Australian Livestock Export Corporation Limited t/as Livecorp
POLICY NUMBER: 03111068
POLICY CLASS: Corporate Travel
SUMS INSURED:

Category B - Insured Persons: Stockmen

Coverage Section

Sums Insured
(each Insured Person)

$  

1 - Personal Injury
If Spouse/Partner and Dependant Children are covered by the Policy, please refer below for the Sums Insured under Coverage Section 1.

Event 1 Death 7.00 x annual income to a maximum of 500,000
Event 2 Permanent Total Disablement 7.00 x annual income to a maximum of 500,000
Events 3 – 19 Other Permanent Disablement 7.00 x annual income to a maximum of 500,000
Event 20 Temporary Total Disablement 85.00 % of income to a maximum of 2,000 per week

Spouse/Partner
Event 1 Death 250,000
Event 2 Permanent Total Disablement 250,000
Events 3 – 19 Other Permanent Disablement 250,000
Event 20 Temporary Total Disablement 85.00 % of income to a maximum of 2,000 per week

Dependant Children
Event 1 Death 20,000
Event 2 Permanent Total Disablement 250,000
Events 3 – 19 Other Permanent Disablement 250,000
Event 20 Temporary Total Disablement Not Insured

2 - Medical Expenses
Unlimited

3 - Emergency Medical Evacuation
1,000,000

4 - Repatriation of Mortal Remains
50,000

5 - Cancellation / Curtailment / Additional Expenses
Unlimited

6 - Personal Liability
10,000,000

7 - Luggage, Personal Effects, Travel Documents, Money & Credit Cards
20,000
Specified Items:
Money and Credit Cards 2,500
Portable Business Equipment 10,000
8 - Alternative Employee or Resumption of Assignment Expenses
10,000
9 - Rental Vehicle Collision Damage and Theft Excess Cover
5,000
10 - Missed Transport Connection
5,000
11 - Extra Territorial Workers Compensation:
   Weekly Benefits
   500
   Common Law
   500,000
12 - Kidnap, Ransom and Extortion
   Insuring Clause 1
   250,000
   Insuring Clause 2
   250,000
   Insuring Clause 3
   250,000
13 - Political Evacuation and Natural Disaster Expenses
   20,000
14 - Corporate Traveler’s Family Assistance
     Refer to Policy

AGGREGATE LIMIT:
Aggregate Limits of Liability:

Section 1 Personal Injury
   (i) Any one Accident or Occurrence
       $5,000,000
   (ii) Non Scheduled Air Travel
        Single-engine
        $1,000,000
        Multi-engine
        $1,000,000
        Helicopter
        $1,000,000

Section 11 Extra Territorial Workers Compensation:
   $1,000,000

Section 12 Kidnap-Ransom and Extortion:
   $1,000,000

Section 13 Political Evacuation and Natural Disaster Expenses:
   $100,000

DEDUCTIBLE AMOUNTS AND/OR EXCESS AMOUNTS:
Deductible and/or Excess Amounts:
Temporary Total Disablement Weekly Benefits - Injury
7 days
Portable Business Equipment
$250 per claim

PERIOD:
From 4pm 30th day of September, 2007
To 4pm 31st day of October, 2008

Subject to the terms, conditions and exclusions of the Policy as issued.

13/12/2007
Dated

Signed for the Company
APPENDIX 11  Special notes on species other than cattle

1. Buffalo

- This animal is potentially the most dangerous animal carried in the trade. Treat them with extreme caution at all times. Older bulls, especially recently caught ferals, are the most dangerous.

- While they generally travel quite well, they can be difficult to load and discharge. If possible, position them on board in a location that is easiest to load into and discharge from. Try to avoid the need to go up or down ramps if possible.

- Buffalo don’t always respond to the jigger the same as cattle do. They will often back up when blocked and may even back all the way back to their pen. Once they are back there they will be very difficult to get out for the second time. Where possible be ready to put a rail behind them in the race to prevent them backing up. Once they turn around in the race, your best option may be to let them into an empty pen and turn them back from there.

- Buffalo are extremely tough and hardy. In the rare instance where a veterinary problem is identified, the appropriate treatment will be the same as for cattle. Don’t try however, unless you have a Westergun or you will be the next one in the sick pen.

- Watch carefully when using narrow alley ways to pass their pens in case they try to hook you with their horns through the rails. They are especially adept at sweeping the floor in an attempt to knock your feet out from under you.

2. Goats

- Can become very dominating over feed troughs and single animals will often stand or lay in them. Once this has happened the others will generally refuse to eat from that bin. To counter this, provide a large number of feed bins and fill them with relatively small amounts of feed. Feed frequently – 3 to 4 times per day. Tip out the old feed before putting the new ration in the trough.

- Goats need plenty of fibre. Try to provide about 20% of their diet as fibre. Cubes will have adequate amounts but pellets will need to be supplemented with hay or chaff.

- Throw the spoiled, uneaten feed onto the floor as bedding.

- Do not hose down if this can be avoided. The dry pellet type faeces will usually not present a problem if left on the deck for the entire voyage. The dry faeces will develop into an excellent bedding material.

- Goats are also very fussy about their water. Replenish troughs with fresh water frequently.

- One of the most common causes of illness in goats is pneumonia. Treat as for cattle with Terramycin LA using appropriate adjustment of dose for weight. Oral Terramycin dissolved in the drinking water is also effective if a larger number of animals are affected.
• Ensure that pens are as secure as you can possibly make them otherwise you will have goats wandering all over the ship.

• Special pellets may be made available for the voyage. In the event that they run out or are unavailable for any reason, cattle fodder will be adequate for a short period.

• Conduct a daily inspection of the goats to identify any sick animals. The easiest way to pick a sick animal is to look for hollow flanks. Once identified, any suspect animals should be segregated in sick pens and aggressively treated. A general treatment with long acting Terramycin and an anti-inflammatory combined with hay or chaff and general TLC will frequently produce successful results as long as the sick animals are identified, segregated and treated quickly.

3. Sheep

• Non-eaters are one of the most common problems with sheep especially on longer voyages. Early identification is essential. Segregate and provide hay and general TLC.

• Sheep may contract Salmonellosis especially if they originate from the south. Signs include depression, fever, loss of appetite and severe scouring (with or without blood). Treat with Trisprim but response is not good and prevention with reduction of stress is the best approach.

• Don’t wash their pens out unless absolutely necessary.

• Feed at least twice per day and ensure water is clean and fresh at all times. If available use electrolytes as often as possible. At least at the beginning and end of the voyage.

• Separate problem stock, treat them with injectible Terramycin and give them plenty of space, electrolytes in the water and fresh feed, preferably hay or chaff.

4. Pigs

• Ensure that their pens are secure as they are escape artists and will be found wandering all over the ship.

• Be patient during loading and discharge. For loading it will usually be advisable to let the experienced pig transport operators get them off the trucks and into their pens. The fewer people involved the better.

• Try to move them in smaller mobs of about 5 to 10 as they tend to pack up in larger groups. A plywood board or shield is extremely useful when moving and handling pigs. It protects the handler from being bitten and is a safe way to put pressure on a pig to move it in the required direction.

• Try to allocate pens just inside the vessel to reduce the distance they need to travel into the ship to get to and from their pen.

• They take a little time to get moving, let them move slowly if they wish. You will only become frustrated if you try to hurry them along.

• Do not under any circumstances use electric prodders / jiggers on pigs.
• **Allocate pens that are well ventilated with plenty of airflow**, as pigs are very sensitive to heat stress. It is common practice to hose them down during the heat of the day but be sure that there is plenty of air movement to assist with cooling. Hosing down with no air movement may make them even hotter.

• **Pigs can’t cope with salt water – make sure they are hosed down with fresh water only.**

• Pigs are susceptible to sunburn so place them in a pen that is not exposed to strong, direct sunlight.

• They will be provided with special feed but if caught, cattle feed will be adequate for a short period.

• The pigs that are transported on cattle ships will usually be very valuable stud animals. If you are experiencing any serious problems that you are not confident in handling, do not hesitate to contact the exporter or veterinarian.

5. **Camels**

• Camels can deliver a savage bite and kick with all four feet and in all directions, so take extra care when loading and managing them on board.

• Loading camels onto a ship is an art. Consult those with experience in this area before making an attempt. The truck driver who is delivering them is likely to be the most knowledgeable person on the spot.

• They have flat-bottomed feet and cannot cope with slippery surfaces. If you need them to walk over a surface that is slippery you will need to put something down such as sand, hay, sawdust or fodder to ensure that they have sound, non-slip footing. If the camel is too scared to walk on what it thinks is a slippery surface, it is almost impossible to force them to move.

• For the same reason, camels hate steep slopes so try to position them in the vessel to avoid the need to negotiate any ramps.

• Don’t attempt to use a jigger on camels (unless you are experienced), as they will not respond well to it except to try to kick your head off.

• When they bail up and refuse to move further just wait and give them a little time to consider their position. They will frequently go where you want them to if you go away and leave them for a short period.

• The maximum height a camel will attempt to go under (doorway or race cap) is the height of the top of their hump. They can judge this height visually when approaching the obstacle and if they perceive it to be too low they will not attempt it. Think of another way.

• While they are very tough creatures, they will initially need bedding on the floor of their pen as they spend a lot of time sitting down. Sawdust or hay is fine. Do not clean out the camel pen as their dry pellet like faeces will form an excellent bed.

• If the camels are not supplied with special camel pellets for the voyage then cattle pellets/cubes will be adequate.

• Veterinary treatments as for cattle but beware of the 360 degrees kicking ability.
6. Horses

- Individual stabling is best where space is available, as horses may not get on with their stable mates and risk injury to each other. If individual stables are not available it may be necessary to shift certain animals around until they find more compatible mates.

- Given adequate space, horses prefer to be stabled 45 degrees to the direction of travel, facing forward and across the ship.

- Do not hose out the pens with the horses in them. If cleaning is required muck out with a rake and add fresh bedding.

- Horses will need a lot of bedding. Use deep straw, hay or sawdust.

- Ensure that all shoes are removed prior to entering the ship, as they can make the animal slip on the floors.

- For valuable and quite horses, leg pads or bandages during loading and discharge will help to reduce injuries.

- Apart from the standard injuries, the most common problem for horses on board will be swollen legs caused by lack of exercise. Where possible, try to walk the animals around the deck alleyways at least once per day.

- The digestive system of the horse is much more delicate than that of cattle. Take great care monitoring the quality of the feed and follow feeding instructions to the letter. Best rations for stabled horses unable to exercise will be low energy, high roughage, mainly chaff and hay. Low energy rations will reduce the energy level of the animal and help to make them less irritable and easier to manage.

- If for any reason you run out of horse feed do not use the cattle feed as a substitute until you have confirmed the contents with someone with detailed knowledge of the cattle fodder formulation. Cattle shipping pellets often contain monensin (used to promote ruminant digestion) which is highly toxic to horses (and dogs) and can even result in death.

- If you have any problems with horses do not hesitate to contact shore immediately for advice.

7. Deer: tropical

- Animals travelling on short haul voyages will almost always be tropical species of deer well suited to the Asian environment. These animals are very hardy and well adapted to heat and humidity. They are generally very good travellers.

- Deer enjoy wallowing in hot weather and may benefit from hosing down (with a light spray) during the heat of the day. They also lick each other's coats when they are wet to get water and presumably salt from their mates.

- Deer will often attempt to wallow in their water troughs so change their water frequently to maintain quality.

- These animals will generally be quite shy and timid so stay away from them as much as possible. When frightened, they tend to run to the far corner of their enclosure and pile up. If they are very frightened, they may pile up on top of each other endangering those on the bottom of the pile. Leave them alone as much as
possible. When feeding, watering and observing, be as quick as possible while taking care not to startle them.

- In most cases the deer will be enclosed in special boxes or high security pens on board which will not need to be entered by the stockman. Special deer pellets, hay and water will be fed from outside their enclosure.

- Do not attempt to clean out their pens, as you will cause too much distress. Simply ensure adequate drainage is established and add more hay to the floor to keep the bedding as dry as possible.

- While deer tend not to be aggressive, in an enclosed space they can be very dangerous, especially stags. Any stags in transit will have their antlers removed but may still run into you by accident and are extremely powerful. They can also kick out at handlers as they leap past so beware. Whenever forced to enter a deer pen (eg. To discharge the pen) use plywood shields for protection.

APPENDIX 12

Live Export Trade Terminology / Organisation

ALEC The Australian Livestock Exporters’ Council is the peak body that represents exporters’ interests.

LiveCorp is the organisation set up by ALEC to conduct business on exporters’ behalf

AQIS Australian Quarantine Inspection Service

ASEL Australian Standards for the Export of Livestock

DAFF Federal Department of Agriculture, Forests and Fisheries

AMSA Australian Maritime Safety Authority - The Federal Government authority with responsibility for the safety of vessels, crew and cargo at sea.

MO43 Marine orders Part 43. The relevant section of the AMSA rules that apply to livestock exports.

MLA Meat and Livestock Australia -The body representing cattle and sheep producers like the former AMLC

NTLEA, QLEA, WALEA etc – State and Territory associations of livestock exporters
APPENDIX 13

Shipboard protocols and terminology

1. Ranking

- Master (Captain)
- Chief Officer (Chief Mate)
- First Officer
- Various engineers - also classed as officers
- Bosun – The “head stockman”, also in charge of ship maintenance duties etc. He will be the main person you will deal with on a day to day working basis
- The Cook – always be nice to the Cook!
- Able Seamen (ABs) – skilled sailors with significant levels of maritime training
- Seamen, “Deck boys” – non-skilled labourers, this category will include the “mess man” who is the cook’s offsider.

2. Shift duties

The ships 24-hour schedule is usually broken up into 6 x 4 hour shifts especially in the case of the officers. Shift arrangements may vary from vessel to vessel but the most common arrangements are:

- Master 0800 – 1200
- First Officer 1200 – 1600
- Chief Officer 1600 – 2000
- Master 2000 – 2400
- First Officer 0000 – 0400
- Chief Officer 0400 – 0800

During their shift times, the officers will be on the bridge or very close to it. When you need to speak to an officer, try to ensure that they are on duty and not sleeping after a shift.

3. Personal behaviour on board

- When coming onboard for the first time introduce yourself to the Master or Chief Officer immediately (unless they are asleep or busy with other duties). The first thing you should clarify is the location of your cabin.
- Ask to be shown the Muster Lists, which are displayed on boards somewhere in the accommodation area. They will state where the stockman must go during emergencies or drills. Make sure you know where to go and when. Ask one of the officers to clarify your position if you don’t understand. Make sure you know where your life jacket is. It will usually be located somewhere in your cabin.
- Ask about meal times and where you are expected to eat. There are usually two messes, one for the officers and one for the crew. The stockman usually eats with the officers but it is best to make sure that this is the case each time you board a new vessel. Seating arrangements are also important. The Master and Officers usually sit in the same seats every day. Find out which is your seat at the table and make sure you don’t sit in somebody else’s place.
• After returning from the cattle holds make sure you clean up before entering the mess. Leave your dirty boots outside the accommodation.

• When you come onboard you will be directed to your cabin. The mess man will be responsible for allocating your bedding, towel, soap and washing powder. If you don’t have any and can’t find the mess man just ask the cook.

• The Bond Store is the locked area on board where duty free grog, cigarettes and other items are kept. A member of the crew will be in charge of this store and it will be opened only a few times per day. If you need something from the store, ask the person in charge and it will be delivered to you the next time it opens. The store will run an account for you which you will be expected to pay for before leaving the vessel. Make sure you remember to pay as it can be very embarrassing for the manager of the store if you don’t. The Bond store is always locked and sealed while the vessel is in port so if you need any supplies during discharge make sure you order and receive them prior to entry to the port.

• Washing of clothes onboard can involve some special scheduling. On some of the smaller vessels, the officers and crew will have specific days on which they have access to the washing machines. Also the mess man may have a special day for washing sheets, towels and tablecloths etc. If you unknowingly wash your filthy clothes after leaving the cattle hold on these days you will not be popular. Just ask someone in the mess if there is any schedule and what it is.

• Tidy up your cabin before you leave the ship.

• If you have any specific dietary needs or favourite foods you will have to bring them yourself if they are not already part of the normal mess rations.

• In the lounge where the TV and video machine are located, there is often some form of routine in respect to when movies are shown and who gets to select them. Don’t just barge in and plug in the one you want to watch, find out if it’s OK first.

4. Maritime terms

• Forward – towards the bow or the front of the vessel
• Aft – towards the stern or the rear of the vessel
• Port – the left side as you are looking forward
• Starboard – the right side as you are looking forward
• “Supercargo” – that’s you. The “supervisor of the cargo”, a non crewmember travelling with the cargo to take care of it on behalf of the owner – it will sometimes be important to explain this to customs and immigration officials who may think that you are a member of the crew in which case the rules for leaving the vessel are quite different.

• Each vessel will have its own method for describing the various decks. It is important to know how to describe a certain position on the ship when speaking with members of the crew. You will normally have become familiar with these terms during the loading of the vessel as they are clearly noted on the load plan. If not, ask a crewmember to make sure that you are absolutely clear about the names of the various decks.
APPENDIX 14

Daily report to the Australian Government
Commencing on day one (1) of the voyage, the report must include the following information:

1. Vessel name
2. Voyage number
3. Date and day number
4. Vessel’s position / estimated time of arrival at next port
5. Mortality
   - daily
   - cumulative
6. Health issues
   - treatments
7. Feed consumption
8. Water consumption
9. Temperature
   - deck
   - ambient (extremes)
10. Humidity
    - deck
    - ambient (extremes)
11. Ventilation
    - performance
12. General comments
    - livestock health and welfare
    - deck conditions
    - issues from daily meeting
    - stocking densities

Email address – animalexp@aqis.gov.au
Fax Number – 61 (0)2 6272 5423
Example of Actual Daily Report Transmission

Stockman – Joe Blow
MV Moocow Express
28.2.2006, Day 2

1 MV Moocow Express
2 Voyage number #
3 29th March 2006 Day 2
4 28 deg South, 112 deg East, ETA Jeddah 14th April 2006
5 Daily Mortality: 1, Cumulative Mortality 3
6 Health: two steers treated for lameness, Antibiotics and anti-inflammatories
7 Feed consumption: averaging 3 kg per head per day
8 Water consumption: 18 Litres per head per day
9 Temperature
   Deck 1 26, Deck 2 27, Deck 3 27, Dec 4 26
   Ambient: 24
10 Humidity
   Deck 1 77, Deck 2 76, Deck 3 75, Deck 4 75
   Ambient: 69%
11 Ventilation functioning normally without problems
12 General comments
   • Stock travelling well, only minor lameness problems under treatment
   • Decks remain dry and comfortable for stock
   • No issues from daily meeting
   • Stocking densities adequate
APPENDIX 15

End-of-voyage report to the Australian Government

Email address – animalexp@aqis.gov.au
Fax Number – 61 (0)2 6272 5423

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

1  Vessel name
2  Voyage number
3  Departure port(s)  
   •  date
   •  total loaded, by species
4  Discharge port(s)  
   •  date
   •  total unloaded, by species
5  Feed and water  
   •  access
   •  maintenance issues
6  Environmental conditions  
   •  weather
   •  temperature
   •  humidity
   •  ventilation
   •  decks/bedding
7  Health and welfare of livestock  
   •  number of livestock born during the voyage
   •  number of abortions
8  Relationships with master/crew/accredited stock person/accredited veterinarian
9  Comments on discharge operations

Remember that a great deal of specific information has already been provided in the daily reports. The final report should analyse the cumulative information provided in the daily reports, not duplicate them. If the voyage was an outstanding success with absolutely no problems then the final report does not need to say much more than just that, except if there are any reasons for the excellent voyage that may be of value to others when planning future shipments.

For more subjects to consider look through the Stockman’s Handbook headings to jog your memory of noteworthy events or issues. Please also forward this report to LiveCorp as soon as possible after the conclusion of the voyage. In most cases this will be when you arrive home in Australia.  

LiveCorp Fax: 02 9929 6733
APPENDIX 16  

Shipment of Calves to the Middle East

Pre-shipment Preparation

1. Where possible avoid exporting *Bos taurus* calves (especially Friesians) from south-eastern Australia during the southern winter.

2. Ensure that holding facilities are well drained and protected from the elements, especially the wind.

3. Maintain modest stocking densities and change bedding frequently to avoid the development and spread of disease.

4. Provide free access to good quality hay or chaff as well as the pellets to be used during the voyage.

5. Only receive animals that have been satisfactorily weaned or those that have an arrival weight of not less than 150 kg at the holding facility.

6. Minimize the number and time of handling of calves during the application of the protocol and other management procedures.

7. Draft calves into appropriate size groupings prior to delivery to the ship.

Shipboard Management

1. Conduct separate space calculations for groups of animals under 200 kg.

2. Give calves 10% additional space over that prescribed by AMSA when stock is sourced from southern ports during winter months.

3. When shipments are under loaded from Portland and Adelaide to Fremantle allow calves to spread out into the additional space.

4. Provide calves with smaller pens and the better areas of ventilation and lighting.

5. Feed calves with conventional cattle fodder and good quality chaff throughout the voyage. Ensure adequate supplies of chaff are provided to allow for this to comprise a significant supplement to the diet of healthy animals & a major part of the diet of sick animals.

6. Ensure different weight range calves are adequately segregated.

7. Provide additional quantities of bedding materials.

8. Clean/wash frequently and provide fresh fodder immediately after the cleaning event. Take extra care when cleaning the pens.

9. Ensure trough heights are appropriate for the supply of both fodder and water. Provide additional feed troughs where possible.

10. Segregate calves of suspect health status to hospital pens with additional space and in locations that allow for easy access and frequent inspections. Provide shipments of calves with additional hospital pen space (3%).

11. Whenever calves are suspected of developing illness treat aggressively with the most appropriate chemicals.

12. Take extra care when using ‘Westerguns’ on smaller calves. Use conventional syringes if this is feasible.

13. Provide appropriate electrolytes/mineral supplements to all voyages carrying calves.

14. Provide additional stockmen to shipments of large numbers of calves.
Appendix 17

Management Planning for Pregnant Cattle: AQIS Orders.

The export of all pregnant cattle requires that a management plan be completed to assist in minimising the animal health and welfare risk.

The management plan includes:

- Ensuring that the animals are no more than 6 months pregnant at the time of shipment
- Ensuring that the animals have a body score not less than 3 or more than 6
- Ensure animals are only penned with those of similar body weight
- Ensure that the animals are loaded at the densities as laid out by ASEL S4.4
- Fodder is calculated at 2.5% body weight
- Chaff or hay are provided at more than 1% of the diet
- Additional veterinary kit is provided as appropriate
- That the stockman travelling with the pregnant animals has significant experience in the management of pregnant cattle
- Bedding is provided as per ASEL requirements: 7 tons or 25 cubic metres for every 1000 square metres of cattle pen space.

APPENDIX 18

Management of Pregnant Dairy cattle on Long Haul voyages

The following recommendations represent industry “Best Practice”.

- Provide pregnant cows with 15-20% more space than AMSA requirements
- Devise the final density after taking into account all the factors associated with the specific animals involved and the expected conditions of that particular voyage – i.e. risk analysis
- Pregnant cows should not be shipped into the northern hemisphere summer
- At the date of departure no animal should be more than 6 months pregnant
- Ensure that the testing veterinarian is proficient at identifying months of pregnancy
- Ensure that the stockman accompanying these voyages has had prior experience with pregnant dairy cattle
- Only ship cattle in body condition 3-6 inclusive (using a scale of 1-8)
APPENDIX 19  Diagnosis of Premature Lactation

Diagnostic and Therapeutic Flow Chart

Is Gland Symmetrically distended?

NO

Are quarters hard/ swollen/ hot?

NO

Can fluid be obtained from quarters?

YES

Mastitis Present

i) Obtain sample aseptically (Protocol 1)

ii) Treat with Leocillin injection OR Gallimycin injection (note irritation)

OR

Trimethoprim/Sulphonamide

iii) Check for teat lesions (fly worry)

NO

Teat dip and monitor

Honey Coloured

i) Obtain aseptic sample

ii) Teat dip and monitor

YES

Teat dip and monitor

Can fluid be obtained?

NO

Mastitis Present

Honey coloured

Teat dip and monitor

Clots/discoloured

YES

Is there pitting oedema of the gland?

NO

i) Check diet for K+/Na+ excess

ii) Check prevalence of problem of group

iii) Consider diuretic treatment if severe
## Appendix 20

### Veterinary Drug Names and Usage

<table>
<thead>
<tr>
<th>Chemical Use</th>
<th>Chemical Name</th>
<th>Trade Names</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics</td>
<td>Oxytetracycline</td>
<td>Oxytet 200 LA</td>
<td>Oxytetracyclines are long acting, use for wounds and general infections. 1 shot lasts for 6 days They are painful, give in 10ml lots at different sites deep, intra-muscularly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terramycin LA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alamycin LA injection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alamycin LA 300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tetravet LA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxytrin LA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engemycin 100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Delcycline 200 LA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bivatop 200</td>
<td>Different, only inject subcutaneously</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terramycin pinkeye</td>
<td>Eye spray for pink eye</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxymav 100</td>
<td>Oral powder, mix with water, good for mass medication without disturbance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxytetracycline 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terramycin 400</td>
<td></td>
</tr>
<tr>
<td>Cloxacillin</td>
<td></td>
<td>Orbenin Eye Ointment</td>
<td>Best option for pink eye</td>
</tr>
<tr>
<td>Tilmicosin</td>
<td></td>
<td>Micotil 300</td>
<td>Best drug for pneumonia</td>
</tr>
<tr>
<td>Trimethoprim + Sulfadiazine</td>
<td></td>
<td>Trisoprim 480</td>
<td>Short acting, best for Salmonella, must repeat daily.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tribirissen Injection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tribactral 48 inject</td>
<td></td>
</tr>
<tr>
<td>Penicillin</td>
<td></td>
<td>Benacillin</td>
<td>Long acting penicillin – 3 days cover, usually 20ml dose. Good for minor infections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aquacaine LA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Duplocillin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Noracillin LA</td>
<td></td>
</tr>
<tr>
<td>Penicillin and Streptomycin</td>
<td></td>
<td>Penstrep</td>
<td>Must repeat daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pen &amp; Strep injectible</td>
<td></td>
</tr>
<tr>
<td>Anti-Inflammatory Agents</td>
<td>Ketoprofen</td>
<td>Ketoprofen Injectable</td>
<td>Reduces pain, inflammation and body temperature.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ketofen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flunixin</td>
<td>Finadyne</td>
<td>Good for downers, injuries, pneumonia and painful eyes. Powerful stress relief.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flunix</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flumav</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flunixil</td>
<td></td>
</tr>
<tr>
<td>Chemical Use</td>
<td>Chemical Name</td>
<td>Trade Names</td>
<td>Comments</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------</td>
<td>-----------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Tolfenamic acid</td>
<td>Tolfidine CS</td>
<td>One shot will last 2-3 days</td>
</tr>
<tr>
<td></td>
<td>Phenylbutazone</td>
<td>Myoton</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Butasyl</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nabudone IM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tomanol</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corticosteroid</td>
<td>Dexamethasone</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexadressson 2mg</td>
<td>Repeat every 12-24 hours, anti inflammatory plus appetite stimulation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexason 2mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Methason 2mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexapent 5mg</td>
<td>Note that 5 mg dose is a more potent concentration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexaphos 5mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexone-5 5mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexadressson V 5mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dexafort 3mg</td>
<td>Long acting appetite stimulant, not potent long acting anti-inflammatory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Voren Depot</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minerals Glucose</td>
<td>Calcium</td>
<td>For treatment of downers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Magnesium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Glucose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diarrhoea treatment</td>
<td>mixtures</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Parnells anti-diarrhoea powder</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scourban</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gastro-enteric mix</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gastrozine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bloat treatment</td>
<td>Various oils / chemicals</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teric bloat liquid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parasite treatments</td>
<td>Avermectins</td>
<td>For internal and external parasites.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ivomec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cydectin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dectomax</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paramax</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paramectin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Virbamax</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bayticol</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flumethrin</td>
<td>For external parasites only.</td>
</tr>
<tr>
<td>Chemical Use</td>
<td>Chemical Name</td>
<td>Trade Names</td>
<td>Comments</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Appetite stimulants</td>
<td>Clanobutin</td>
<td>Bykahepar, Coforta</td>
<td>Includes Vitamin B</td>
</tr>
<tr>
<td></td>
<td>Butaphosphan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedatives</td>
<td>Xylazine</td>
<td>Rompun 100mg, Xylazine 100</td>
<td>2-4 mls of the 100 mg product should be enough to slow an adult animal right down or make it lay down.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xylazil 100, Xylaze 100</td>
<td></td>
</tr>
<tr>
<td>Sedative Reversing Agent</td>
<td>Yohimbine 4 Aminopyridine</td>
<td>Reversine, Xylex</td>
<td>Either on their own or both together for better result</td>
</tr>
<tr>
<td>Skin treatment</td>
<td>Cetrimide</td>
<td>Cetrigen wound spray</td>
<td>Referred to as &quot;purple spray&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cetridine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chlorfenvinphos</td>
<td>Defiance S</td>
<td>Best skin wound treatment</td>
</tr>
<tr>
<td>Electrolytes</td>
<td>Various salts + Glucose</td>
<td>Glucotrans, Vytrate</td>
<td>100 grams to 60 litres water</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trolyte, Wesfarmers Maxi-Min</td>
<td>Read directions on container</td>
</tr>
</tbody>
</table>
APPENDIX 21

Map of Middle East
APPENDIX 22

Map of South East Asia

East Asia
APPENDIX 23

Australian Ports of Loading showing the 26th parallel

[Map showing Australian Ports of Loading with the 26th parallel marked]