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1. Summary

On 20 February 2014, Total Livestock Genetics (TLG) exported 2400 cattle by sea from Portland to Tianjin (China). There were 49 mortalities on the voyage, a mortality rate of 2.04 per cent. This exceeds the reportable mortality level of 1.0 per cent for cattle on voyages of ten days or greater as prescribed by the *Australian Standards for the Export of Livestock (ASEL)*.

Rough seas during the first day of the voyage caused injuries, resulting in euthanasia of many of the injured animals.

2. Introduction

On 20 February 2014, Total Livestock Genetics (TLG) exported 2400 cattle by sea from Portland to Tianjin (China). There were 49 mortalities on the voyage, a mortality rate of 2.04 per cent. This exceeds the 1.0 per cent reportable mortality level for cattle on voyages of ten days or greater as prescribed by the *Australian Standards for the Export of Livestock (ASEL)*.

The purpose of this report is to investigate the cause of mortalities in these cattle exported by sea to China and to determine if any action is required to reduce the likelihood of a recurrence.

The Department of Agriculture investigated the mortalities by reviewing the following information:

- Documents from TLG
- Documents from the Australian Government Accredited Veterinarian (AAV) who prepared the consignment
- Phone interviews with shipboard AAV
- Daily reports, end of voyage report and treatment records
- Documents from the regional Department of Agriculture veterinary officer
- Report from Australian Maritime Safety Authority (AMSA)
- Department of Agriculture records from previous and subsequent journeys
- Records from the registered premises

This was the first consignment by sea for TLG. Between February 2005 and this consignment seven exporters have sent a total of 277 652 cattle from Portland to China by sea with a mortality rate of 0.11% (314 mortalities out of 277 652).

3. Investigation Findings

The Livestock

The cattle in this consignment were:

- Holstein breed
- 2205 pregnant heifers
- 195 non-pregnant heifers
- 350 – 550kg in weight
- 12 to 24 months in age

Preparation in the Registered Premise

The cattle were sourced from 52 properties in New South Wales, South Australia, Tasmania and Victoria and assembled at one registered premises (Glenormiston Livestock Assemble Depot) between 24 December 2013 and 2 January 2014. The animals were then held in isolation for 47 days from 3 January 2014.

There were five mortalities in the registered premises. Two were diagnosed as having pneumonia, one was euthanised due to a spinal injury during transport, one was euthanised due to hip luxation and fractured acetabulum and one had no confirmed cause of death.

An AAV inspected cattle during pre-export quarantine on 17 February 2014. Five animals were rejected due to ringworm and three animals were rejected due to pink eye at this inspection. As the ships departure was delayed another inspection was completed to meet the requirements for inspection within 24 hours of departure. A different AAV inspected the cattle on 18 February 2014

and one animal was rejected for ringworm. A Department of Agriculture veterinary officer (DVO) also inspected the cattle on 17 February 2014 and again on 18 February 2014. In addition veterinarians from China Inspection and Quarantine Services (CIQ) were present during the health and welfare inspections. Permission to leave for loading was issued on 18 February 2014.

Loading of the vessel

A DVO supervised the loading. No cattle were rejected during loading which started at 8.35 am and finished at 8.35 pm on 19 February 2014.

Conditions during the Voyage

On Day 1 of the voyage the ship encountered rough weather and high seas. Review of the Master's report by AMSA confirms that the vessel altered course twice due to moderate rolling and further experienced heavy rolling on 20 February 2014.

Throughout the voyage the wet bulb temperature on all decks ranged between 12.5°C and 27.3°C and relative humidity ranged between 57.6% and 75.1%. Temperature and humidity is not considered to have contributed to mortalities on this consignment.

Mortalities and treatment during the voyage

All mortalities (except for one) were a result of euthanasia due to injuries sustained during rough weather and high seas on the first day of the voyage. One animal was found dead in the pen, this animal was down on the first day.

Table 1 shows the mortality rate by deck location (D deck is the lowest and SS deck is the highest deck).

Table 1 – Stocking density and mortality percentage by deck

Deck	Stocking density (m ² per animal)	No. of mortalities/No on deck	Weight	Mortality %
SS FWD	1.79	6/284	401-500	2.10
SS AFT	1.66	2/339	300-401	1.18
S FWD	1.78	1/278	401-500	
S AFT	1.47	4/308	300-400	0.65
A FWD	2.45	0/159	>500	
A AFT	1.85	0/257	300-400	
B AFT	1.82	0/258	401-500	
B FWD	2.56	0/145	>500	
C FWD	2.62	2/117	>500	1.70
C AFT	1.94	12/173	401-500	6.94*
D FWD	2.63	5/82	>500	6.09*
Hospital Pen		17		
TOTAL		49/2400		2.04

*D forward and C aft are the lowest two decks

The AAV reports that injuries on the C aft and D forward decks were entirely downer heifers with splayed hind legs. They also reported that no external injuries were visible and the injured animals were mainly larger heifers (around 500-550 kg). A list of the weights of the injured animals that were euthanised shows that 27/49 (55 per cent) were greater than 450 kg. These animals were treated by rope hobbling (legs tied with rope to prevent splaying), anti-inflammatories and adding additional sawdust to the pens.

On the port (left) side upper decks (mainly A row on the SS deck forward and aft) limb injuries occurred. These injuries were swollen fetlock and carpal joints with associated skin abrasions/ulcers over bony prominences. Sore feet due to scuffing of the tips of the toes were also seen. These animals were treated with antibiotics. Animals were euthanised on a case by case basis after showing no response to treatment. Table 2 shows the record of treatments.

Sawdust was spread in all pens prior to loading. Extra sawdust was applied to the S and SS decks forward and aft and thick sawdust was applied to the hospital pens. The manifest confirms that 40mt of bagged sawdust was on board. This is above the requirements specified in ASEL of 7 t for every 1000 m² of cattle pen space.

Eighteen animals that were treated and responding to treatment were rejected on arrival in Tianjin and euthanised at that time.

An interview with the AAV on board confirmed that limited post mortems were completed on some animals. The post mortem reports showed some discolouration of the adductor muscle of the hip of one animal: other animals showed no specific lesions. No hip dislocations were observed clinically or during partial post mortem.

Table 2 - Chronology of treatments and mortalities during the voyage

Day	Daily Mortalities	Cumulative Mortality	Cumulative Mortality %	Treatments/Comments
0	0	0	0.00%	2400 cattle loaded in Portland Sawdust applied prior to loading
1	0	0	0.00%	
2	0	0	0.00%	33 animals down with splayed legs due to rough weather. Downer animals treated with hobbling and anti-inflammatories. Sawdust applied to hospital pens.
3	0	0	0.00%	39 animals treated with anti-inflammatories, 3 animals treated with antibiotics, 27 animals unable to rise. Seven centimeters of sawdust added to hospital pens and hobbling of downer animals. Extra sawdust applied on port and starboards sides of S and SS decks forward and aft.
4	5	5	0.21%	33 downer animals, 24 downer animals treated with antibiotics, 1 ill-thrifty animal treated with vitamin B 4 animals euthanised 1 animal died overnight

Day	Daily Mortalities	Cumulative Mortality	Cumulative Mortality %	Treatments/Comments
5	11	16	0.67%	36 animals treated with antibiotics including 29 lame animals 16 downer animals 4 animals treated with vitamin B 11 animals euthanised
6	5	21	0.88%	14 animal treated with antibiotics including 12 lame animals 16 downer animals 2 animals treated with vitamin B 5 animals euthanised
7	1	22	0.90%	21 animals treated with antibiotics including 8 lame animals and 2 for eye infections 11 downer animals 4 animals treated with vitamin B 1 animal euthanised
8	2	24	1.00%	13animal treated with antibiotics including 12 lame animals 11 downer animals 1 animal treated with vitamin B 2 animals euthanised All aft decks washed and sawdust re-applied
9	1	25	1.04%	9 downer animals 8 lame animals treated with antibiotics 1 animal euthanised All forward decks washed and sawdust re-applied
10	5	30	1.25%	14 lame animals treated with antibiotics 1 animal treated with vitamin B 5 animal euthanised
11	1	31	1.29%	1 downer animal 9 lame animals treated with antibiotics 1 animal euthanised

Day	Daily Mortalities	Cumulative Mortality	Cumulative Mortality %	Treatments/Comments
12	0	31	1.29%	14 animals treated with antibiotics including 10 lame animals 4 downer animals 7 animals treated with vitamin B1 All forward decks washed
13	0	31	1.29%	15 animals treated with antibiotics including 9 lame animals 3 downer animals All aft decks washed
14	0	31	1.29%	31 animals treated with antibiotics for lameness 4 downer animals All forward decks washed, sawdust applied to all pens
15	0	31	1.29%	26 animals treated with antibiotics for lameness 8 downer animals All aft decks washed, sawdust applied to all pens aft and also to exposed pens on the forward decks
16	0	31	1.29%	27 animals treated with antibiotics for lameness 3 downer animals
17	0	31	1.29%	Moved cattle in hospital pens in preparation for discharge 22 animals treated with antibiotics for lameness 1 animal treated with vitamin B
18	0	31	1.29%	21 animals treated with antibiotics for lameness 4 downer animals
19	18	49	2.04%	18 animals rejected in port and euthanised

Feed and water

Food and water availability met the ASEL-prescription for a minimum feed allowance of 2.0% of live weight per animal per day. The AAV reported some difficulties maintaining feed and water to downer animals, however, good assistance was provided by the crew and adequate access to food and water was achieved.

4. Australian Maritime and Safety Authority Evaluation of the Vessel

AMSA investigates vessels when the total voyage mortality reaches at least 1%. Following the vessels return to Australia AMSA completed an on board investigation of the vessel.

The AMSA investigation reported that:

- No apparent deficiencies were recorded at the pre-loading inspection on 18 February 2014.

- All certifications and documentations required to be on board were current and valid at the time of departure and during the voyage.
- A port State Control inspection and an Annual Endorsement Inspection for the vessel's Australian Certificate for the Carriage of Livestock (ACCL) was also carried out with the ACCL endorsed for another 12 months.
- Checks of the vessel's power sources, ventilation and lighting measures, fodder and water arrangements, drainage system and loading stability revealed that during the voyage all machinery and arrangements on-board the vessel were maintained in serviceable condition.
- There was no breakdown in machinery including ventilation, watering, feeding or drainage systems during the voyage.
- The Master accessed the 'MeteoConsult' weather reporting system before commencing the voyage.
- The vessel altered course twice due to moderate rolling and experienced heavy rolling from around 7.15 am on 20 February 2014.
- The Master followed a procedure for 'Navigation in Heavy Weather' and took appropriate action. Those actions included consideration of diverting the course of the vessel from the original plan, returning back to the loading port and reduction of speed of the vessel. Following further reference to the latest weather information from 'MeteoConsult', the master determined it would not be safe to return to Portland.

The AMSA investigator concluded there was no apparent failure of arrangements and systems required by *Marine Orders - Part 43* and were of the opinion that the rough sea conditions caused heavy cattle to succumb to injury.

5. Conclusions

The mortalities in this consignment were a result of rough weather and high seas resulting in injuries to the cattle. These cattle were initially treated by the AAV on board and those that did not respond to treatment were euthanised. Eighteen cattle were responding to treatment but were rejected from discharge in Tianjin and were euthanised at that time.

6. Actions

At the time of finalising this report TLG had exported one further consignment by sea. An AAV travelled with this consignment. There were no mortalities reported on this voyage.

The exporter has advised that for any future consignments they will take a proactive approach working with the Captain to avoiding any severe weather conditions by delaying departure or adjusting the route.