



Australian Government
Department of Agriculture

Mortality Investigation Report 44

Cattle exported to Japan in January 2013

January 2014



Summary

On 4 January 2013, two consignments of cattle were exported on the same vessel from Australia to Japan.

In one consignment of 390 cattle, there were seven mortalities, a mortality rate of 1.79%. This exceeds the reportable mortality level of one per cent prescribed by the *Australian Standards for the Export of Livestock* (ASEL).

In the other consignment of 720 cattle, there were four mortalities, a mortality rate of 0.56%, which is less than the ASEL reportable mortality level. Only the consignment of 390 cattle that exceeded the reportable mortality level is considered in this report. None of the seven cattle that died were identified as being sick or injured prior to death. High temperature and humidity developed from the start of the voyage resulting in heat stress which may have contributed to some of the mortalities.

1. Information Reviewed

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

- Report from the exporter
- End of voyage report, daily reports and additional information from the stockman who accompanied the consignment onboard the vessel
- Report from the Australian Government Accredited Veterinarian (AAV) who prepared the consignment.
- Report from the master of the vessel
- Information provided by Australian Maritime Safety Authority (AMSA)
- Report from the regional departmental veterinary officer
- Records from the registered premises
- The department records from previous and subsequent voyages.

2. Background

This reportable mortality incident is the second recorded in a consignment of feeder cattle exported to Japan since the introduction of the ASEL in 2005.

The department does not routinely require a veterinarian to be on board as a standard requirement for feeder cattle exports from Brisbane to Japan. On voyages where there is no veterinarian on board, the LiveCorp accredited stock person is responsible for reporting to the department and works with the Master of the vessel and the crew to maintain the health and welfare of the livestock on board.

3. Investigation Findings

3.1. The Exporter

The exporter of this consignment is experienced in preparing feeder cattle for Japan and has a history of low mortality voyages, however this is the exporter's second reportable mortality incident. Prior to this consignment, the company had exported a total of 13 consignments of feeder cattle to Japan. A total of 5990 cattle were exported across the 13 consignments, with eight consignments recording no mortalities, four consignments recording a single mortality, and one consignment that recorded seven mortalities, giving an overall mortality rate of 0.17%. Company personnel were once employed by a different export company that exported 39 consignments of feeder cattle to Japan without incident between 2007 and 2011.

3.2. The Livestock

The cattle in the consignment were representative of cattle commonly exported by sea from Australia to Japan. That is, the cattle were:

- Angus crossbreed
- approximately 8 – 12 months of age;
- 273 - 288 kg in weight;
- body condition score of 2.5 - 3 out of 5
- covered by short summer coats (around 1 cm).

3.3. Pre-export Preparation in the Registered Premises

The cattle were sourced from four properties and assembled at one registered premises from 13 December 2012 to 4 January 2013. The registered premises where the animals were held has been used to prepare feeder cattle for export to Japan for more than 70 consignments since 2005.

Weather conditions in the registered premises were hot during the preparation period with a maximum temperature of 36.2 °C reached on 2 January 2013. During pre-export preparation, 11 cattle were rejected because they did not meet importing country requirements. There were no reports of illness in the cattle, and no cattle died during their time in the registered premises.

An AAV inspected the cattle on three occasions during pre-export quarantine. A departmental veterinarian inspected the cattle on 3 January 2013. The cattle were observed to be healthy with no animals rejected or needing further attention. Permission to leave for loading was issued on 4 January 2013.

3.4. Loading onto the Vessel

A departmental veterinarian and export control officer supervised loading. Neither the department nor the exporter rejected any cattle during loading. Loading started at 10:48 am and was completed by 3:12 pm. The exporter's consignment of 390 cattle was the last to load onto Decks 3 and 4, the highest decks of the vessel.

3.5. Mortalities and Treatments During the Voyage

Seven cattle died in the consignment of 390 cattle, giving a 1.79% mortality. ASEL prescribes the reportable mortality level for cattle on voyages greater than ten days as 1.00%. The reportable mortality level was reached on day four of the voyage.

This vessel has four decks, designated one to four, with deck one being the lowest and deck four being the highest. Cattle in the consignment were housed on decks three and four. Mortalities for this consignment occurred on deck three. Stocking density and mortality percentage by deck is shown in Table 1. The stocking densities were in accordance with ASEL requirements.

Table 1 – Stocking density and mortality percentage by deck

Deck	Stocking density (m ² per animal)	Mortality %
1	1.08	0.3%
2	1.06	0.9%
3	1.07	1.9%
4	1.04	0

Cattle in the other consignment were housed on decks 1 to 3 and mortalities occurred on all decks except deck 4.

The voyage lasted for 17 days. Six of the seven mortalities occurred on day 3 and one mortality occurred on day 5. The onboard stockman attributed all of the mortalities to heat stress. The stockman reported that the mortalities occurred predominantly in ‘hot spots’ on decks 2 and 3.

Thirteen cattle received antibiotic (long acting penicillin) treatment for pink eye. The antibiotic was given at the recommended dose rate and the stockman tracked the progress of treated cattle.

3.6. Conditions During the Voyage

Throughout the voyage the wet bulb temperatures on all decks ranged between 9°C and 30°C and the relative humidity ranged between 52% and 85%. Table 2 includes data from the stockman’s daily voyage reports. Temperatures varied during the voyage and were hottest during days three to eleven.

Table 2 - Wet bulb temperature and humidity during the voyage for Decks 1 to 4

Temp = Temperature, Hum = Humidity

Day	Deck 1		Deck 2		Deck 3		Deck 4	
	Temp	Hum	Temp	Hum	Temp	Hum	Temp	Hum
1	25	72	25	72	25	72	23	65
2	26	73	26	73	26	73	24	66
3	27	73	27	73	28	74	26	73
4	29	80	29	80	30	80	27	79
5	29	80	29	80	30	80	27	79
6	28	80	29	80	29	80	26	79
7	28	80	28	80	29	80	26	79
8	27	83	27	83	27.5	83	25	85
9	28	77	29	80	29	80	28	74
10	28	80	29	80	29	80	29	80
11	28	80	28	80	29	80	27	80
12	24	78	24	78	25	79	24	78
13	19	55	19	57	20	58	18	56
14	16	60	16	60	13	64	13	64
15	16	60	15	59	15	59	12	49
16	11	54	11	54	10	52	9	55
17	Discharging in Port							

Heat stress threshold is the maximum wet bulb temperature at which body temperature can be effectively controlled by the animal. Mortality limit is the wet bulb temperature at which the animal will die. For Angus crossbreed cattle the heat stress threshold is 30°C and the mortality limit is 33.2°C¹. For this consignment, the temperatures recorded on the daily reports indicated that cattle on deck 3 were exposed to temperatures at the heat stress threshold on days four and five. On day three there were six mortalities and the wet bulb temperature did not exceed 28°C. The wet bulb temperature did not exceed 30°C on any deck on any day.

According to the master's and stockman's report, the ship encountered hot weather conditions with high humidity and rough seas at the beginning of the voyage. In response to high heat and humidity, water was kept continuously running over the top deck in order to reduce the temperature in the decks and the cattle were washed twice a day. Washing heat-stressed cattle is recommended as it provides relief from heat, reduces the possibility of mortality and improves the animals' welfare. From day seven of the voyage onwards, the stockman reported that the cattle showed no signs of heat stress, appeared comfortable and travelled well.

3.7. Feed and Water

The average fodder the cattle consumed was at least 6.7kg/head from day 3 until the final day of the voyage. This meets the ASEL-prescribed level of 2.0% of live weight per animal per day. On the first two days of the voyage, the cattle consumed less than the ASEL minimum feed requirement. This has previously been noted to be a normal time frame for cattle to acclimatise to the onboard environment. The feed provided to the cattle during the voyage was the same feed that was provided during the preparation period in the registered premises.

The watering system was by manual supply into large troughs with total stock water usage measured separately and reported daily. The vessel has onboard storage in excess of 600 megatonnes of fresh water and reverse osmosis water production plant that is capable of producing in excess of 25 megatonnes of fresh water daily. The master and stockman reported that all cattle had sufficient water available at all times.

3.8. Discharge

Discharge of cattle at Shinmoji port, Japan was unremarkable.

3.9. Australian Maritime and Safety Authority (AMSA) Evaluation of the Vessel

The Australian Maritime Safety Authority (AMSA) carried out an investigation of the vessel upon its return to Australia. The mortalities on this voyage also occurred in specific areas of the vessel (portside and aft pens of decks 1, 2 and 3), prompting an examination of the vessel's ventilation.

The AMSA Surveyor investigated the vessel on 7 February 2013. The report noted that several areas of all pens on the vessel did not have any measurable air flow, however the evidence provided by the owner found the vessel complied with *Marine Orders Part 43* for a vessel built prior to 2004. The AMSA Surveyor also approved the vessel for its annual ACCL and pre-load inspection for its next voyage.

4. Conclusions

For the first six days of the voyage the vessel encountered high temperatures, relatively high humidity and rough seas. The high temperatures and humidity may have contributed to the mortalities. The stockman reported that that cattle died in pens with air flow 'dead spots', however the AMSA investigation found areas of no measurable air flow throughout the vessel, including in pens where no mortalities occurred.

The investigation did not find any information to link the mortalities to the preparation of the cattle in the registered premises or the loading of the vessel. The cattle were prepared and loaded in accordance with ASEL requirements, ate well during the voyage and were given access to adequate amounts of water.

5. Actions

The department applied the following conditions to the exporter's next consignment to Japan:

1. That an AAV accompany the consignment to report on the health and welfare of the livestock.
2. That the cattle loaded by the exporter are provided with an additional 10% space above that required by the ASEL.
3. The AAV must provide daily reports to the department in accordance with ASEL Appendix 5.1.
4. The travel and load plan supplied to the department's Northeast Region must include the number and class of livestock to be loaded on each tier / deck.
5. The end of voyage report must specify the number of deaths that occurred on each tier / deck and the number of deaths in each class of livestock.

This consignment departed Brisbane on 10 February 2013. No mortalities occurred during the voyage.

Subsequent to the mortality incident referenced in this report, the owners of the MV Murray Express carried out maintenance on the vessel's ventilation system, including installation of industrial fans to address areas of poor air flow. The new ventilation has been tested compliant with *Marine Orders Part 43*. The vessel has maintained a valid Australian Certificate for the Carriage of Livestock (ACCL) and AMSA checks the ventilation at every pre load inspection prior to loading. The report from the AAV that accompanied two voyages subsequent to the mortality incident stated the industrial fan installation made a noticeable improvement to air flow in the areas where the cattle had died.

6. References

1. Maunsell Australia Pty Ltd. 2003. *LIVE.116 Development of a heat stress risk management model*. Sydney: Meat and Livestock Australia.
2. Gaughan, J. 2003. 'LIVE.219 Wetting cattle to alleviate heat stress on ships' in *Tips & Tools*. Sydney: Meat & Livestock Australia.