



Investigation into reportable cattle mortality level on sea voyage from Fremantle, Western Australia to Jakarta, Indonesia, February/March 2009.

1. Purpose

To report on the investigation into the cause of mortalities in cattle exported by sea to Indonesia, and to make recommendations with the objective of reducing the likelihood of a recurrence.

2. Summary

There were two consignments of cattle on this voyage. In one consignment of 1990 cattle, there were 14 mortalities, which equated to a mortality rate of 0.70%. In the other consignment of 15 breeder bulls, no mortalities were recorded. This investigation only reports on the consignment of cattle that resulted in a reportable mortality.

3. Background

The investigation into the mortality was completed by reviewing the following information:

1. End of Voyage and daily reports from the Australian stockman who accompanied the consignment on board the vessel.
2. Records from the AQIS Accredited Veterinarian (AAV) who prepared the consignment.
3. Report from the master of the vessel.
4. Report from the Australian Maritime Safety Authority (AMSA).
5. Report from the AQIS regional certifying officer.
6. Records from the registered premises.

Table 1 Chronology of events showing cumulative mortality (count and percentage) by day

Date	Day	Event	Cumulative voyage Mortality Count	Cumulative Mortality %
25/02/2009	Loading	1990 cattle loaded in Fremantle	0	0.00%
26/02/2009	1	Nil Mortality	0	0.00%
27/02/2009	2	Nil Mortality	0	0.00%
28/02/2009	3	Nil Mortality	0	0.00%
1/03/2009	4	1 Cow Euthanized	1	0.05%
2/03/2009	5	1 Mortality, 1 Cow Euthanized	3	0.15%
3/03/2009	6	3 mortalities	6	0.30%
4/03/2009	7	2 Mortalities	8	0.40%
5/03/2009	Discharge	3 mortalities and 3 cows euthanized	14	0.70%

The reportable mortality trigger for a short haul (less than 10 days) cattle voyage is 0.5 per cent (or 3 animals whichever is greater). The reportable mortality level was not triggered until the ship was in port in Jakarta (on 5 March 2009).

4. Findings

4.1 Mortalities in the Registered Premise

The cattle exported from Fremantle were delivered to the registered premise between 19 and 21 February 2009. During the pre-export assembly period no mortalities were recorded. There were no reports of any health problems during the assembly period.

4.2 Loading

The loading records indicate the stocking density of the cattle was in accordance with the Australian Standards for the Export of Livestock (ASEL).

4.3 Journey

Table 2 shows climatic conditions and feed and water consumption by day. The temperature and humidity readings shown are an average across all decks. This information was obtained from the stockman's daily reports.

Table 2 Climatic conditions, average feed and water consumption per head by day

Day	Dry Bulb (°C)	Wet Bulb (°C)	Humidity (%)	Feed (kg)	Water (L)	Comments
1	24	20	73	6.5	25	Cloudy Skies, moderate seas and moderate swell. Vessel rolling and pitching easily
2	25	22	77	6.8	40	Cloudy Skies, moderate seas and moderate swell. Vessel rolling and pitching easily
3	28	25	78	7	42	Cloudy Skies, moderate seas and moderate swell. Vessel rolling and pitching easily
4	29	27	79	8.5	48	Cloudy Skies, moderate seas and moderate swell. Vessel rolling and pitching easily
5	30	27	79	8	49	Cloudy with rain, rough seas and moderate swell.
6	29	27	83	8	50	Cloudy with rain, rough seas and moderate to light swell.
7	30	27	79	8	45	Cloudy skies, slight seas and low swell.

Figure 1 shows the wet bulb temperature for each deck and each day as well as the heat stress threshold (HST). Heat stress threshold is the maximum ambient wet bulb temperature at which heat balance of the deep body temperature can be controlled using available mechanisms of heat loss.

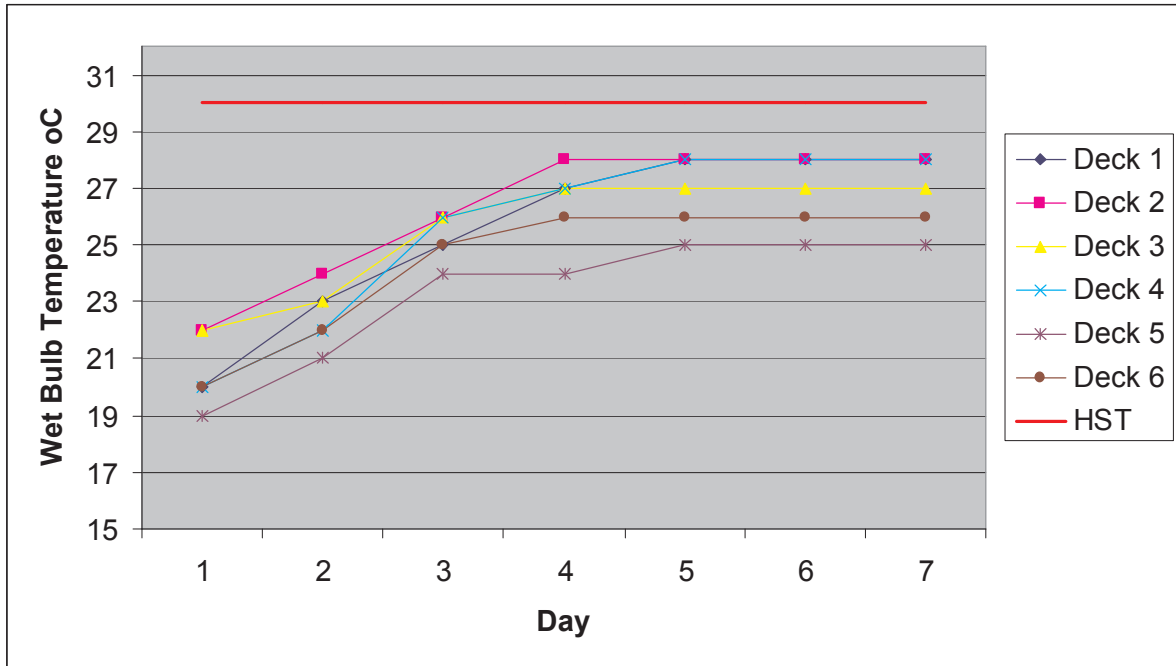


Figure 1 Wet bulb temperatures by deck and day and heat stress threshold (HST)

The maximum wet bulb temperature recorded during the voyage was 28°C, which is below the heat stress threshold (for *Bos Taurus* beef cattle) of 30.0°C¹.

The available information indicated that the cattle were not exposed to unusually adverse environmental conditions across the entire vessel. There were no extremes of temperature or humidity recorded that would be expected to be associated with deaths due to primary heat stress.

However the stockman reported that on 4 occasions during the voyage, the ventilation stopped and that there were ‘hot spots’ in the aft sections of decks 3 and 4. The stockman reported that portable exhaust fans were added to these locations to counteract this. The stockman reported that these ‘hot spots’ contributed significantly to the mortalities with all mortalities occurring in the aft sections of decks 3 and 4. The Captain’s report also concluded that mortalities were due to high humidity.

There were no reports of rough sea conditions.

Table 3 - Number of livestock loaded, mortality count and % mortality by class.

Class of cattle	Number Loaded	Mortality Count	Mortality %
Heifers	572	0	0.00%
Steers	708	1	0.14%
Cows	710	13	1.83%
Total	1990	14	0.70%

Table 3 shows that 13 of the 14 cattle that died were cows. 7 cows and 1 steer died during the voyage. The stockman’s daily reports indicated that 2 of these 7 cows were euthanized because of hip problems. There is insufficient information available to establish a definitive cause of mortality for the remaining 6 animals that died during the voyage.

In addition to the 8 mortalities during the voyage, the captain's report indicated that 3 cows died in port and a further 3 cows were euthanized after being rejected by the receivers in Indonesia. The cause of mortality and reasons for rejection were not specified.

The stockman's daily reports indicated that that 9 of the 14 animals treated during the voyage were cows. Reasons for treatment included lameness, pink eye, respiratory disease, high temperature and inability to rise.

5. AMSA evaluation of the vessel upon return to Australia

AMSA evaluated the vessel on return to Australia. AMSA conducted a detailed investigation into the ventilation systems because the end of voyage report raised concerns about the ventilation systems on the vessel. The AMSA investigation identified ventilation problems in three pens; these were not the same pens in which the stockman reported 'hot spots'. The investigation found that according to the ships official record of equipment, there was no equipment missing from the ship. The AMSA report stated that during the voyage, a single mortality occurred in one of the pens in which ventilation problems were detected. The AMSA report concluded that ventilation failure alone did not appear to be the only cause of the mortalities.

6. Conclusion

Thirteen of the 14 mortalities were cows. Five of the 13 cow mortalities were euthanased. There is insufficient information available to definitively determine the cause of the remaining 9 mortalities. The available information indicated that heat stress may have contributed to, but was not the sole cause of, the mortalities.

From a review of this voyage and other recent reportable mortality events, cows have featured as a higher risk class of cattle for export by sea. It is not clear at this stage if cows are a significantly higher risk than other classes of cattle (i.e. steers, heifers and bulls) across all voyages or if these are isolated incidents.

7. Recommendations

- a. AQIS to write to the Livecorp technical working group to ask for their review of the current standards for the export of cows at different times of the year with a view to preparing a paper for consideration by the Livestock Export Standards Advisory Group (LESAG)
- b. The livestock export industry to consider amending the Stockman's handbook for the transport of cattle by sea to include the requirement for stockmen to record any treatments given, including the date, type of treatment, dosage, frequency, identity of animal treated and response to treatment
- c. The livestock export industry to consider a program to enable the collection (and processing on return to Australia) of post mortem samples on each voyage to provide definitive information for the diagnosis in the event of a reportable mortality investigation or detection of an animal health issue

8. Actions

AQIS placed the following conditions on a subsequent consignment of cattle exported from Fremantle to Indonesia by this exporter:

- . Cattle for export must be resident for 3 clear days in the registered premises immediately prior to the export
- . The cattle must be provided with 10 per cent additional space above the requirements of the ASEL
- . In addition to the accredited stockman required by ASEL, an AQIS accredited veterinarian is required to travel with, and report on the voyage

9. Results

The number of mortalities for the following consignment with these conditions in place was below the reportable level. Of the 1830 cattle loaded on the same vessel, there were 8 mortalities during the voyage (0.44%). At the time of finalization of the report, the exporter has not exported any subsequent consignments.

In addition to this voyage, the vessel has completed three further voyages for other exporters. The number of mortalities on each of these consignments remained below the reportable level with two voyages having nil mortality and the third having a mortality of 0.24%.

References:

1. Maunsell Australia Pty Ltd. 2003. LIVE.116 Development of a heat stress risk management model. Meat and Livestock Australia.