**Mortality Report 74 Cattle exported by sea to China in July 2018**

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**Summary**

On 8 July 2018, Phoenix Exports Pty Ltd (Phoenix) exported a consignment of slaughter cattle from Portland to China.

There were 33 mortalities in the consignment of 2,192 cattle, which resulted in a mortality rate of 1.51 per cent. This exceeds the reportable mortality level of 1 per cent for cattle on voyages of ten days or greater duration as prescribed by the *Australian Standards for the Export of Livestock* (ASEL*) V2.3.*

After investigation by the department, heat stress was found to be the main cause of the mortalities.

An IO accompanied the voyage and was directed to undertake and monitor activities in the approved export programs for the purpose of ensuring the health and welfare of the cattle during the course of the export activities.

**Information reviewed**

The department investigated the mortalities by reviewing the following information:

* mortality report from the exporter
* daily voyage reports (DVR), the end of voyage report (EOV) and additional information from the Australian Government Accredited Veterinarian (AAV) who accompanied the consignment on board the vessel
* load plan, mortality data, Registered Premises (RP) treatment records, line weights, voyage data and vessel treatment data provided by the exporter
* documents from the Australian Government Accredited Veterinarian (AAV) who prepared the consignment
* report from the Master of the vessel
* documents from the regional department veterinary officer (DVO)
* records from the registered premises
* department records from previous and subsequent voyages.
* Independent Observer (IO) report ([IO summary report 12](http://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/independent-observations-livestock-export-sea/report-12))

**Background**

This reportable mortality incident is the second recorded for cattle exported by sea to China in 2018. The previous incident (Report 73) occurred in May 2018 with the same exporter, however a different vessel was involved. The first incident resulted in 46 mortalities of 3,180 cattle in the consignment with a mortality rate of 1.45 per cent and the investigation found that the main cause of the mortalities was pneumonia and heat stress.

Exports of slaughter cattle to China commenced in February 2017. 14 consignments of slaughter cattle had been exported between February 2017 and this mortality event, carrying 28,291 cattle with 137 mortalities in total, resulting in an overall average mortality rate of 0.48 per cent. Five of 15 consignments were sent by Phoenix. These consignments had on average approximately 2,500 head and an average mortality rate of 0.84 per cent. Prior to this event, Phoenix have had one other reportable mortality event in May 2018 (see [Report #73](http://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-mortalities/cattle-china-report-73)).

**Investigation Findings**

**The Livestock**

All cattle in the consignment were Bos Taurus, predominantly Angus with an average weight of 597 kilograms. The exporter initially planned to include heavy cattle over 650 kilograms, however removed them from the consignment due to the expected high wet bulb temperatures and risk of heat stress on the voyage. The cattle were sourced from three properties of origin, one in New South Wales and two in South Australia. All cattle were sourced from vendors or third-party feedlots previously used by the exporter.

**Preparation in the registered premises**

The cattle were assembled at one RP in Portland, Victoria. The RP has previously been used to prepare slaughter cattle for China for three consignments including this consignment and was previously used by Phoenix for a slaughter cattle consignment to China. The cattle were held at the RP for at least seven days before they left for loading. This is above the ASEL requirements for a minimum of two clear days in an RP for long haul voyages with one port loading and one port discharge.

Weather conditions in the RP were cold with temperatures around 14°C during the day dropping to as low as 4°C overnight (Bureau of Meteorology, 2018). There was approximately 30mm of rainfall during the quarantine period and it was noted in RP daily inspection reports that the paddock conditions were intermittently wet. The wind increased considerably towards the end of quarantine from 33km/h up to 107km/h, which contributed to the cooler conditions.

An AAV was present when the cattle were inducted into quarantine during 28 and 29 June 2018 and a Phoenix representative inspected the cattle daily at the RP during the period 30 June to 6 July 2018. Final inspection of the cattle was completed by the AAV and DVO on 6 July 2018. The DVO report noted the heavy cattle were within the right weight range however these cattle were later removed from the consignment.

There were 18 treatments recorded in the RP, the majority for lameness. Of these, 14 were shipped and four were rejected prior to leaving the RP. The majority of the animals treated at the RP were sourced from the property of origin furthest from the RP (approximately seven hours). The daily reports from the RP noted this could have contributed to their lameness issues. All treated animals that were exported had no reported issues during the voyage and completed discharge.

The RP daily reports stated the animals from one of the South Australian feedlots struggled to adjust to conditions in the RP and were not eating very well. These animals were linked to the majority of the mortalities on the vessel.

**The vessel**

This was the second time that the vessel had been used by Phoenix for slaughter cattle to China. The first consignment was from the same load port to a different destination port and recorded five mortalities from 2,382 head of cattle, which resulted in a 0.21 per cent mortality rate. The vessel was previously a container ship before being converted into a livestock carrier.

**Loading onto the vessel**

The exporter advised the DVO that there were no issues during loading and no cattle were rejected. The cattle were given adequate space as required by ASEL based on their average weight of 597kg. Phoenix provided the vessel stowage plan to the department to demonstrate that cattle were loaded at rates specified in ASEL for voyages greater than 10 days. 835 MT of fodder was loaded which was sufficient and above the ASEL requirements.

**Conditions during the voyage**

On this voyage, the AAV was responsible for reporting to the department and working with the master of the vessel and crew to maintain the health and welfare of livestock on board.

The cattle consumed an average of 11 kilograms of fodder per head per day based on information provided in the daily voyage reports. Consumption was determined as an average for all cattle on board, and was not broken down by deck, species or class.

On the decks that animals were most affected by heat, the wet bulb temperatures ranged from 14⁰C on day one up to 32⁰C on day 15. Temperatures on all decks remained over 29⁰C from day eight until discharge. The relative humidity peaked at 92 per cent on day seven and then remained over 84 per cent until discharge. The pant scores for the cattle on all decks peaked at day seven and remained at the pant score of three (panting) for the duration of the voyage. At the worst, up to 1 per cent of animals on the vessel were gasping. The AAV reported cattle were uncomfortable during these conditions with decks 4 to 8 being most affected. The AAV reported heavier cattle struggled in the heat and humidity from day five onwards.

The AAV reported they were unable to leave the deck water supply on without supervision due to issues.  The water system on the vessel was unreliable with hose fittings and taps breaking with no spare parts to fix them and water troughs being knocked off railings leading to flooding.

**Mortalities and treatments**

There were a total of 33 cattle mortalities in the consignment of 2,192 head, with the final mortality rate of 1.51 per cent. The mortalities were linked to one main property of origin and the AAV reported cattle from this property were slow to gain their appetite in the RP.

The first mortality was recorded on day one, which was due to an injury sustained as a result of the rough seas. Twenty-five of the mortalities occurred during the voyage, 16 of these were attributed to heat stress, six to injury and three to peritonitis or unknown. The remaining eight mortalities occurred during discharge and no known cause was determined due to the inability to conduct a post mortem whilst in port. The majority of the mortalities were Angus steers of the same weights and fat score. Details of the mortalities are presented in Table 1.

**Table 1: Break-up of cattle mortalities by day and deck.**

| **Day** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **Total** | **No. Loaded** | **%** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Deck 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 1  | 203  | 0.49  |
| Deck 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 183  | 0.00  |
| Deck 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 174  | 0.00  |
| Deck 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1  | 0 | 2  | 314  | 0.64  |
| Deck 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 313 | 1.60 |
| Deck 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 0 | 0 | 2  | 2  | 0 | 0 | 0 | 4  | 9  | 322  | 2.80  |
| Deck 7 | 1 | 0 | 0 | 0 | 0 | 1  | 2  | 2  | 0 | 0 | 3  | 0 | 2  | 0 | 0 | 1  | 2  | 14 | 469  | 2.99  |
| Deck 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1  | 2  | 214  | 0.93  |
| **Total**  | **1**  | **0**  | **0**  | **0**  | **0**  | **3**  | **2**  | **2**  | **1**  | **0**  | **5**  | **3**  | **4**  | **1**  | **0**  | **3**  | **8** | **33**  | **2192**  | **1.51**  |

**Graph 1: Mortalities by day showing corresponding wet bulb temperatures and pant scores.**


The AAV noted on day seven the cattle were not coping with the hot and humid conditions. In particular deck 7 was affected and this is reflected as the deck having the highest mortalities. Due to the exporter allowing the animals more space than required, the AAV reported he was able to move cattle from deck 7 to other decks to give the cattle even more space on deck 7. The AAV further noted that a combination of rain and washing down during the voyage seemed to assist the animals as they appeared more content and their appetite increased. However the feed the animals were consuming consisted of a high proportion of pellets which could have exacerbated their metabolic heat production and risk of heat stress.

Thirty-five treatments were recorded on the vessel, the majority of these were for lameness. Twenty-seven of the animals treated discharged the vessel, the remaining eight were mortalities. Twenty-five of the animals treated on the vessel originated from one property of origin and accounted for seven of the resulting mortalities.

The AAV noted the cause for nine mortalities could not be determined, this was mainly due to the fact that a post mortem was unable to be conducted, although they reasonably determined heat stress would have been a primary or secondary factor.

A rapid increase in mortalities occurred when the vessel crossed the equator. The temperature and pant scores peaked on these days, however the persistent high temperatures and humidity throughout the voyage did not allow animals any reprieve from heat and mortalities accumulated.

The AAV commented throughout the voyage that water was unable to be turned on at all times due to hoses bursting off troughs causing decks to become wet and increase humidity. The Australian Maritime and Safety Authority (AMSA) were notified at the conclusion of the voyage and their evaluation is detailed under Australian Maritime and Safety Authority Evaluation of the Vessel below.

Phoenix confirmed the majority of mortalities were linked to the same property of origin and noted these animals did not acclimatise in the RP or on the vessel. Phoenix also stated these animals more stress-prone. Phoenix attributed the cause of the mortality event to heat stress and livestock (having been sourced from Southern Australia) were not acclimatised to continuous high temperatures and humidity experienced throughout the voyage.

**Exporter’s Actions**

Phoenix implemented an Animal Welfare Risk Assessment (AWRA) after their first mortality event to China in June 2018 (see [Report #73](http://www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-mortalities/cattle-china-report-73)).  The AWRA was developed to identify various activities to be undertaken to mitigate risks associated with similar China consignments. Even after the AWRA was implemented, a second reportable event occurred resulting in the department suspending Phoenix’s Approved Arrangement to China, and did not allow them to export until they changed their sourcing specifications and developed a sufficient management plan for slaughter cattle consignments to China.

In response to their suspension, Phoenix changed their management practices for slaughter cattle consignments to China and discussed these with the department. Phoenix confirmed they would conduct an internal review of their Approved Arrangement and develop a Bos Taurus management plan.

The aim of the Bos Taurus management plan was to identify all risks associated with sending that type of cattle on voyages to China and would incorporate the existing AWRA. As heat stress was the main link between the two reportable events, Phoenix confirmed they would no longer send the same type of cattle and change their sourcing requirements for these consignments. As the cattle were heavy Bos Taurus, grain-fed cattle, Phoenix advised they would source grass-fed cattle with a lower fat score, to ensure their metabolic heat production and risk of heat stress was reduced.

In the response to the first reportable event, Phoenix advised they would use a different Bovine Respiratory Disease vaccination regime. This regime was implemented for this voyage. BRD did not appear to be a major contributing factor to the mortalities on this voyage.

Phoenix also advised they would provide an anemometer to the shipboard AAV so they could verify temperatures and humidity readings throughout the voyage. The AAV’s reports confirm that this was completed.

**Australian Maritime and Safety Authority Evaluation of the Vessel**

The Australian Maritime Safety Authority (AMSA) conducted an investigation following this voyage. AMSA applied conditions to the vessel’s Australian Certificate for the Carriage of Livestock (ACCL) preventing it from undertaking long-haul voyages (ten days or greater duration) until actions were taken to address the drainage and trough issues. The issues were rectified and AMSA issued an ACCL without conditions in October 2018.

**Conclusions**

The department’s review found that the sourcing and type of the cattle were not suited to the conditions they would experience on voyages to China. Bos Taurus cattle are known to have a higher risk of experiencing heat stress and this combined with the fact the cattle had been grain fed prior to loading increased this risk. The vessel had problems with livestock services that may have affected the crew’s ability to meet animal welfare standards. The additional factor was these cattle were sent from cold wet conditions in Australia across the equator to a Northern Chinese summer contributed to the cattle experiencing heat stress. Additionally, cattle from one property of origin showed signs of stress and loss of appetite in the RP prior to loading onto the vessel.

The department assessed the findings by Phoenix that the cause of the mortality incident was heat stress and that this was related to sourcing, class/type of livestock and extreme weather. The department determined that a combination of cold and wet weather during quarantine, unsuitable class and type of livestock, and extreme weather—as suggested by Phoenix—are thought to have led to the cattle mortalities.

The department determined based on the information provided that the AWRA was not fully implemented effectively for the type of cattle being exported as the risk of heat stress remained high, resulting in the suspension of Phoenix’s Approved Arrangement to China. There were further discussions with Phoenix and they developed a Bos Taurus Management Plan and advised the department that they would no longer be sending grain fed cattle but rather grass fed with a lower fat score.

The Independent Observer observations were found to be consistent with the findings of the AAV.

The department determined that the additional actions taken by Phoenix after their second reportable mortality were sufficient to have their suspension lifted in November 2018 however additional conditions were applied to their Approved Arrangement to ensure Phoenix complies with their Bos Taurus management plan.