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## KEY FINDINGS FROM INVESTIGATIONS INTO FOUR RECENT VOYAGES RESULTING IN HIGH MORTALITIES

VOYAGES: M.V. AL SHUWAIKH (V20)	(Portland & Fremantle)
M.V. CORMO EXPRESS (V84)	(Adelaide & Fremantle)
M.V. CORRIEDALE EXPRESS (V152)	(Portland & Fremantle)
M.V. AL MESSILAH (V20)	(Portland & Fremantle)

### FACTORS CONTRIBUTING TO SHEEP MORTALITIES:

- 1. Environmental:** The sheep were sourced from and prepared in cool/cold environmental conditions (6 July 2002 – 29 July 2002). Within 22 to 28 days after departing Australia, on entering the Middle East, the sheep were exposed to extreme environmental conditions (ie. temperatures 35-38 degrees Celsius, humidity 70-95%).
  - The significant change in environmental conditions was identified by the veterinarian/stockmen which accompanied these voyages as causing 'heat stress' in numbers of sheep and was stated in their reports as being a contributing factor to the sheep mortality levels.
  - A recent report by Simon More (commissioned by Livecorp) claimed that the stocking density used on these voyages and the temperature/humidity experienced on route significantly contributed to the final voyage mortality rates.
- 2. Disease:** Voyages departing Portland experienced a relatively high incidence of severe diarrhoea/salmonella like signs, resulting in mortalities either directly, or secondarily as a result of inanition. The diarrhoea/salmonella like signs commenced within days of departing Portland. When these signs occurred, the accompanying stockman or veterinarian usually diagnosed it as the primary cause of death.
  - Detailed clinical diagnosis confirming the primary cause of the sheep mortalities has not been undertaken but veterinarians accompanying the voyages, and subsequent voyages, have hypothesized that salmonellosis syndromes are a prominent cause of deaths.
  - It has been widely speculated that salmonella syndromes are multi-factorial; factors include exposure/resistance to salmonella bacteria, sourcing of sheep, transport arrangements and exposure to adverse environmental factors and affect the stress levels of the sheep or the level of salmonella challenge.
- 3. Portland:** Live sheep exported out of Portland experienced the highest mortality rate of all sheep exported during these voyages. This is consistent with the 2001 average voyage mortality rate of sheep out of Portland (2.10%) compared with Adelaide (1.48%) and Fremantle (0.96%).
  - The incidence of mortalities in sheep exported from Portland correlates with the increased incidence of suspected salmonella related signs in sheep loaded at this port.

4. **Whole-of-chain:** The whole-of-chain preparation and management of sheep destined for export appears to significantly impact on the health of all animals during the export voyage. There is evidence that sheep consignments subjected to minimal transport stress in Australia, accustomed to shipboard rations prior to export and protected from harsh environmental conditions during pre-export preparation, have minimal mortalities.
5. **Conclusion:** There is still a great deal of work to be done to develop a sound understanding of the problems and solutions. Of particular interest are measures to decrease stress on the sheep such as appropriate feedlot infrastructures and stocking densities on board vessels.