LIVE EXPORT'S
HUGE CARBON FOOTPRINT

EXECUTIVE SUMMARY

This paper looks at the environmental impact of the live export of cattle and sheep from Australia to Southeast Asia and the Middle East. It follows two ships on recent journeys: the *Ocean Drover*, which appeared on the *Four Corners* episode "A Bloody Business" as it prepared to leave for Indonesia with 13,000 cattle aboard, and the *Al Messilah*, which generated headlines when it returned to Adelaide, Australia, after experiencing major mechanical problems on its way to the Middle East with 67,000 sheep.

This paper estimates the total carbon-dioxide (CO_2) emissions of Australian live exports in 2009 to be approximately 1.8 million tonnes, which puts the live-export industry among the top 40 CO_2 emitters in Australia in that year. Stopping the trade would be equivalent to removing approximately 320,000 cars from Australian roads.

TABLE OF CONTENTS

INTRODUCTION

Live export has been a contentious issue in Australia for decades. Debate flares anew each time a major disaster occurs at sea or more atrocities are documented at a destination site. One of the more infamous examples is the 2003 *Cormo Express* disaster, during which 6,000 of 57,000 sheep perished in horrendous conditions of heat and squalor[1] aboard the ship after it was refused entry into Saudi Arabia and had to search for a new port of disembarkation. In another disaster, 50 per cent of the cattle aboard the *Becrux* died from overheating[2] on the ship's maiden voyage in 2002. Following such events, the industry continues to operate in a fog of public ignorance or indifference much of the time. But there have been several occasions on which horrors so extreme have been captured on film that the public has been sufficiently outraged to demand government action. Any resulting action, though, has always been *ad hoc*, tokenistic and generally ineffectual.

While these ships briefly became household names because of these events, this paper does not document the individual debacles that often accompany live-export voyages. It instead details an area of live export that is generally overlooked in the brief, sensational flurry of news articles that often accompanies these events: the enormous carbon footprint of these giant ships unnecessarily carrying millions of animals around the world.

THE SHIPS

Two live-export voyages from 2011 will be examined in some detail: a 30 May voyage of the *Ocean Drover*, which was leaving Darwin, Australia, for Indonesia with 13,000 cattle when the story about the atrocities at Indonesian abattoirs broke, and the 8 August voyage of the *Al Messilah*, which left Adelaide for Qatar only to be towed back a day later with mechanical problems and scores of dead sheep aboard. The carbon footprints of these two ships will be considered first, and then conclusions will be drawn based on figures for the industry as a whole.

THE *OCEAN DROVER*

On 30 May 2011, one of the most respected Australian current-affairs programmes, *Four Corners*, aired an episode called "A Bloody Business". The episode shocked Australians with its graphic video footage of Australian steers in Indonesian abattoirs being pulled down, kicked and whipped and having water sprayed into their noses, their limbs broken, their eyes gouged out and their throats hacked at with blunt knives.

Kerry O'Brien introduced the programme's presenter, Sarah Ferguson, who began the report by saying, "At the docks in Darwin, 13,000 Australian cattle begin their journey to Indonesian slaughterhouses to be killed. With little commotion, they're moved up ramps onto the massive cattle ship the *Ocean Drover*".[3]

The Wellard report states that the *Ocean Drover* is nine decks high with 2.4 hectares (6 acres) of space and can carry 75,000 sheep or 18,000 cattle at any one time.

The *Ocean Drover*, call sign 9V8143, is registered under the flag of Singapore. It is 176 metres long and 30 metres wide and has a deadweight (safe carrying capacity) of 13,400 tonnes. It has a 15,000-horsepower engine and uses 45 tonnes of fuel per day.[4] Its gross tonnage is 33,774.[5]

According to the *Ocean Drover*'s owner, Wellard Rural Exports,[6] the ship is "the world's largest, purpose-built livestock carrier". In June 2010, the ship celebrated its 100th journey, having carried 670,368 cattle and 3,837,127 sheep a distance of 1.7 million kilometres since its launch in 2002.

Wellard Rural Exports, which is Australia's largest livestock exporter, purchased the ship in June 2009.[7] It was formerly named the *Becrux* – the very same ship on which 50 per cent of the cattle aboard had died of heat exhaustion during a voyage seven years earlier.

The Wellard report states that the *Ocean Drover* is nine decks high with 2.4 hectares (6 acres) of space and can carry 75,000 sheep or 18,000 cattle at any one time. Cattle are currently worth $600 per head, making a full load worth more than $10 million.[8]

Cattle sold to Indonesia are rejected if they weigh more than 350 kilograms when loaded and delivered.[9] We can therefore assume that the total weight of the cattle aboard the *Ocean Drover* as featured on *Four Corners* was approximately 4,500 tonnes. (Multiply 350 kilograms by 13,000 animals, and then divide by 1,000 kilograms to get the total weight in tonnes.) This is about one-third of the deadweight, but the ship must also carry feed, drinking water, equipment, fuel and the crew.

Bandar Lampung in Sumatra, Indonesia, is almost 3,000 kilometres from Darwin.[10] The *Ocean Drover*'s May 2011 voyage took six days.[11] Using 45 tonnes of fuel per day, the ship would have needed 270 tonnes of fuel for this trip. Carbonfund.org calculates[12] that sea freight generates 0.105 pounds (47.6 grams) of CO_2 per ton-mile. A ton is 0.90719 metric tonnes, and a mile is 1.609344 kilometres. So a ton-mile is 0.5637 tonne-kilometres. The metric equivalent calculation is 84.44 grams of CO_2 per tonne-kilometre. So if the ship is close to its deadweight of 13,400 tonnes and has to travel 3,000 kilometres, it would emit approximately 3,394 tonnes or 3.3 million grams of CO_2 (40 million tonne-kilometres at 84.44 grams of CO_2) during this short voyage. This does not include the methane emissions from the cattle themselves.

Of course, ships need to get to the embarkation port, and as Australia does not import live animals, ships are almost certainly going to arrive empty. Crew and equipment must still be carried, though, and the mass of the vessel itself is the heaviest part of the equation. The *Ocean Drover*'s recently retired sister ship, the *Ocean Shearer*, for example, had a deadweight of 23,263 tonnes,[13] while its gross tonnage was 60,513 tonnes,[14] so the ship and its non-cargo items (equipment, fuel, crew, etc) made up approximately three-quarters of the weight being pushed across the ocean. A conservative estimate of the emissions generated during the *Ocean Drover*'s empty voyage to Australia, therefore, would be at least 50 per cent of the outgoing journey's emissions, or 1,697 tonnes of CO_2.

Added to this is the CO_2 emitted during the transport of the animals from the farm gate to the port. The origins of the cattle aboard the *Ocean Drover* in May 2011 are not clear, although it was mentioned on *Four Corners* that 500 of them came from the property of former Cattlemen's Association President Rohan Sullivan[15] in Mataranka,[16] which is about 420 kilometres southeast of Darwin. Other cattle are transported hundreds or thousands of kilometres to the port.[17] Using Carbonfund.org trucking estimates, transporting 4,500 tonnes of cattle an average of 1,000 kilometres would generate 2,372 tonnes of CO_2. (Shipping by truck generates 0.654 pounds or 297 grams of CO_2 per ton-mile, or 527 grams per tonne-kilometre.)

So, including the transport of 13,000 cattle to the port and six days aboard the *Ocean Drover*, this live-export voyage resulted in the emission of approximately 7,490 tonnes of CO_2. This estimate does not include mustering, feeding before or after the export journey, transport on arrival or the power sources used on the ship as well as at each port. This figure breaks down to 576 kilograms of CO_2 emitted per animal.

The *Ocean Drover*'s 30 May route is one of the shortest trips that animals make in the live-export industry. The 2003 voyage of the *Cormo Express*, which ended up in Eritrea with 6,000 sheep dead out of 57,000 after three months[18] at sea, would have exceeded the length of the *Ocean Drover*'s route by as much as 10 times. Had the *Cormo Express* sailed directly and been accepted in Saudi Arabia, it still would have

faced a journey of at least 16 days.[19] It is therefore worth comparing the carbon footprint of a live-export ship carrying sheep to the Middle East, which is where the vast majority of sheep are taken.

THE *AL MESSILAH*

The *Al Messilah*, call sign 9KWH, is registered under the flag of Kuwait. It is 185 metres by 32 metres with a deadweight of 14,201 tonnes. The *Al Messilah* is a former car carrier[20] built in 1980.[21] It is famous for its mechanical problems[22] as well as for being named in Hansard (the record of parliamentary debate) as a vessel of choice for deserters of the merchant navy.[23] It was converted to a live-animal carrier in 1997 with the capacity to carry approximately 80,000 sheep.[24] It has a record of excessive mortalities on its voyages, including 2,173 sheep who died in 2002 on a trip to Kuwait, Bahrain and Muscat, Oman,[25] and another 1,683 who died in 2006 on a trip from Tasmania to the Middle East.[26] Most sheep are shipped from Fremantle, Australia, but a shortage of sheep in Western Australia means that an ever-increasing number of sheep are now being shipped from South Australia and Victoria.[27]

On 8 August 2011, the *Al Messilah* left Adelaide for Qatar with 67,000 sheep owned by Emanuel Exports of Perth. The ship travelled for one day before it broke down and was towed back into port, where it sat for a week before the decision was made to unload the animals. South Australia's Agriculture Minister admitted that many sheep had already died by then.[28]

The distance from Port Adelaide to the Port of Ras Laffan in Qatar is 7,808 nautical miles,[29] which is 14,460 kilometres. It would normally take up to 20 days[30] to complete the trip. According to the estimate for sea freight emissions (84.44 grams of CO_2 emitted per tonne-kilometre), if the *Al Messilah* was at approximately 85 per cent of its deadweight of 14,200 tonnes and had to travel 14,460 kilometres, the ship would have emitted 14,700 tonnes of CO_2 (175 million tonne-kilometres at 84.44 grams) had it successfully made the trip. Assuming the *Al Messilah* would have then returned to Adelaide (and ignoring emissions from its trip to Singapore[31] for repairs), it is estimated that the ship would have emitted at least 7,369 tonnes of CO_2 (half the total emissions of its outbound trip) on its return voyage.

The ship travelled for one day before it broke down and was towed back into port, where it sat for a week before the decision was made to unload the animals.

Land travel for sheep would be marginally less than for northern cattle in that the distances covered in the Northern Territory are greater, but some sheep are trucked all the way from Tasmania to Portland, Victoria. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) defines the standard reference weight of a sheep as between 40 and 50 kilograms,[32] not including fleece. Estimating that the 67,000 sheep aboard the *Al Messilah* weighed an average of 45 kilograms, their total weight would equal 3 million kilograms or 3,000 tonnes. Assuming that each animal would need to travel at least 500 kilometres and using the Carbonfund.org estimates for CO_2 emissions (0.654 pounds or 297 grams of CO_2 per ton-mile, or 527 grams per tonne-kilometre), trucking 67,000 sheep would emit 794 tonnes of CO_2. (Assuming that the trucks are used for other cargo on their return to the rural areas, which is

© Mark Churchman

somewhat unlikely, we have not included emissions for return journeys.)

Therefore, total emissions for the *Al Messilah*, had it not broken down, would have been 22,900 tonnes or 342 kilograms of CO_2 per animal, not including methane emissions from enteric fermentation.

CARBON FOOTPRINT

In our overall analysis, we have used the following figures from 2009, as 2010 figures were considered atypical because the Indonesians had imposed a weight limit of 350 kg on cattle, which resulted in a decrease in live exports. Since then, 2011 was also affected by the suspension of trade after the *Four Corners* exposé of live export. Figures from 2009 represent a more typical year.

According to Meat & Livestock Australia, livestock were exported from 18 separate Australian ports in 2009. Cattle are mainly exported from the Port of Darwin in the Northern Territory and from Broome and Wyndham in northern Western Australia. The live export of sheep is concentrated in Fremantle, Western Australia; 72 per cent of sheep exports departed from this port in 2009. Approximately 28 per cent of sheep exports depart from Victoria and South Australia. Dairy cattle exports are sourced primarily from Victorian producers and, to a lesser extent, from Western Australia. Goat exports mainly depart from Perth and Adelaide.

In 2009, Australia exported 3.56 million sheep, 954,143 cattle and 97,261 goats.[33] If cattle generate 576 kilograms of CO_2 per animal, 954,143 cattle would generate 549,702 tonnes of CO_2. If sheep generate 342 kilograms of CO_2 per animal, 3.56 million sheep would generate 1.22 million tonnes of CO_2. Therefore, total annual emissions from the live transport of cattle and sheep (excluding the 97,000 goats) would be 1.8 million tonnes of CO_2.

Using the equivalence standard proposed by the US Environmental Protection Agency[34] of 5.5 metric tons of CO_2 per car, ending live export would be the same as *removing 320,000 cars from Australian roads*.

> **The live-export industry should therefore be paying more than $40 million in carbon taxes (based on $23 per tonne) instead of receiving some $100 million in taxpayer subsidies.**

A recent article in *The Daily Telegraph* listed the major companies that are liable for a carbon tax because they fall into the category of "the top 50 emitters".[35] There have actually been around 500 companies liable for the tax since its commencement. The top emitter, Macquarie Generation, emitted more than 23 million tonnes of CO_2 to produce around 40 per cent of New South Wales' power. The lowest on the top 50 list, Qenos, a plastics manufacturer, emitted 839,000 tonnes of CO_2. That range puts live export at number 39 among the top 50 carbon emitters in the country. Live-export emissions are higher than the emissions generated by Virgin Australia, Conoco, BP Regional, Shell Australia and AGL Energy.[36]

The live-export industry should therefore be paying more than $40 million in carbon taxes (based on $23 per tonne) instead of receiving some $100 million in taxpayer subsidies.[37]

CONCLUSION

The live-export debate has rightly centred on the ethics of cramming animals onto trucks and ships and letting them die by the thousands on their way to slaughter, which is often carried out with such extreme cruelty that it would be illegal if it occurred in Australia. However, there is also a major environmental cost to be considered in allowing this trade to continue.

Calculations indicate that cattle, who are mostly transported to Indonesia, generate the equivalent of 576 kilograms of CO_2 each. Sheep, who are lighter animals but are transported approximately seven times farther to the Middle East, generate 342 kilograms each. The total emissions of the Australian live-export industry in 2009 (multiply the number of animals exported in 2009 by the kilograms of CO_2 emitted per animal) equals approximately 1.8 million tonnes of CO_2. This puts the live-export industry among the top 40 emitters in Australia. The elimination of this trade would be equivalent to removing 320,000 cars from Australian roads.

[1]RSPCA, "Livestock Deaths Just the Tip of the Iceberg", 21 Dec 2009 <http://www.rspca.org.au/assets/files/Media/1221DannyF11sinking.pdf>.

[2]RSPCA, "End Live Exports", nd <http://rspcawa.asn.au/~rspcawa.asn.au/index.php?option=com_content&view=category&layout=blog&id=140&Itemid=642>.

[3]Australian Broadcasting Corporation, "A Bloody Business", *Four Corners*, 30 May 2011, television <http://www.abc.net.au/4corners/content/2011/s3230934.htm>.

[4]MarineTraffic.com, "*Ocean Drover*", nd <http://www.marinetraffic.com/ais/shipdetails.aspx?mmsi=564444000>.

[5]Wellard, "MV *Ocean Drover*", nd <http://www.wellard.com.au/home/shipping/shipping-fleet/mv-ocean-drover.html>.

[6]Wellard, "MV Ocean Drover Reaches Centenary Voyage Milestone", 21 June 2010 <http://www.wellard.com.au/assets/files/pdf/21%20Jun%2010%20-%20MV%20Ocean%20Drover%20reaches%20centenary%20voyage%20milestone.pdf>.

[7]Wellard, "Wellard Invests in Live Export Shipping Fleet", 17 June 2009 <http://www.wellard.com.au/assets/files/pdf/2009/17%20Jun%2009%20-%20%20Wellard%20invests%20in%20live%20export%20shipping%20fleet%20(49.71%20Kb).pdf>.

[8]Annie Sanson, "Ocean Drover Rounds Cattle Up", *Northern Territory News*, 22 Sept 2009 <http://www.ntnews.com.au/article/2009/09/22/86781_nt-business.html>.

[9]ABC News, "Ban Leaves Cows Too Fat for Indonesia: Grazier", 20 July 2011 <http://www.abc.net.au/news/2011-07-20/cows-too-fat-after-export-ban/2802110>.

[10]Flightpedia.org, "Flightpedia", <http://www.flightpedia.org/distance-darwin-australia-to-bandar-lampung-indonesia.html>.

[11]Australian Broadcasting Corporation.

[12]Carbonfund.org, carbon shipping calculator <http://carbonfund.org/how-we-calculate>.

[13]MarineTraffic.com, "*Ocean Shearer*", nd <http://www.marinetraffic.com/ais/shipdetails.aspx?MMSI=353861000>.

[14]Wellard, "MV *Ocean Shearer*", nd <http://www.wellard.com.au/home/shipping/shipping-fleet/mv-ocean-shearer.html>.

[15]Australian Broadcasting Corporation.

[16]National NRM Knowledge Conference, "Rohan Sullivan", nd <http://www.agentur.com.au/NRM/N_R_M/keynote_speaker_Sullivan.html>.

[17]JC Petherick, "Animal Welfare Issues Associated With Extensive Livestock Production: the Northern Australian Beef Cattle Industry", *Applied Animal Behaviour Science*, 92.3 (2005): 211-234 <http://www.sciencedirect.com.ezproxy.scu.edu.au/science/article/pii/S0168159105001413#sec2>.

[18]Michael Condon, "Stressed Sheep Research", *South Australian Country Hour*, ABC Rural, 31 Oct 2003, radio <http://www.abc.net.au/rural/sa/stories/s979677.htm>.

[19]Howard Sacre and Shaun Devitt, "Ship of Shame", *60 Minutes*, 21 Sept 2003, television <http://www.liveexportshame.com/60_minutes2.htm>.

[20]Meyer Werft, "*Al Messilah*", nd <http://www.meyerwerft.com/page.asp?lang=e&main=1&subs=0&did=825>.

[21]MarineTraffic.com, "*Al Messilah*", nd <http://www.marinetraffic.com/ais/shipdetails.aspx?MMSI=447014000>.

[22]ShipwreckLog.com, "Shipwreck Log", 12 Aug 2011 <http://www.shipwrecklog.com/log/tag/al-messilah/>.

[23]Susan Cass, "World's Worst Practice: Australia's Live Export Trade", LiveExportShame.com, June 2011 <http://www.liveexportshame.com/admin/resources/live-export-ships-worlds-worst-practice-june-20111.pdf>.

[24]Meyer Werft, *Hightech Afloat: Shipbuilding in Papenburg*, nd <http://www.cruiseweb.nl/images/meyerwerft/brochure.pdf>.

[25]Stop Tasmanian Animal Cruelty, "The '*Al Messilah*'", nd <http://www.stoptac.org/index.php?page=the-al-messilah>.

[26]Animals Australia, "Live Export FOI Reports", <http://www.animalsaustralia.org/media/foi/>.

[27]Fiona Meyers and Gemma Gadd, "Sheep Live Exports on Rise", *Weekly Times*, 16 Feb 2011 <http://www.weeklytimesnow.com.au/article/2011/02/16/296101_sheep.html>.

[28]ABC News, "Everything Ship-Shape, Say Sheep Exporters", 19 Aug 2011 <http://www.abc.net.au/news/2011-08-18/al-messilah-leaves/2844900>.

[29]Ports.com, distance calculator <http://ports.com/sea-route/port-of-adelaide,australia/port-of-ras-laffan,qatar/>.

[30]*Meat Trade News Daily*, "Australia – 67,000 Sheep Stranded on Vessel May Have to Be Unloaded", 17 Aug 2011 <http://www.meattradenewsdaily.co.uk/news/170811/australia_____sheep_stranded_on_vessel_may_have_to_be_unloaded.aspx>.

[31]ShipSpotting.com, "*Al Messilah* - IMO 7924425", <http://www.shipspotting.com/gallery/photo.php?lid=1375090>.

[32]M Freer, AD Moore and JR Donnelly, "The GRAZPLAN Animal Biology Model for Sheep and Cattle and the GrazFeed Decision Support Tool", CSIRO Plant Industry Technical Paper, Sept 2003 <http://www.csiro.au/proprietaryDocuments/TechPaper_Oct03.pdf>.

[33]Australian Livestock Export Animal Welfare Group, "Get the Facts: About Livestock Exports", nd <http://www.liveexportcare.com.au/GetTheFacts/AboutLivestockExports/>.

[34]US Environmental Protection Agency, "Emission Facts: Greenhouse Gas Emissions From a Typical Passenger Vehicle", Feb 2005 <http://www.epa.gov/oms/climate/420f05004.htm>.

[35]Geoff Chambers, "The 50 Worst Carbon Tax Offenders and Their Carbon Cost", *The Daily Telegraph*, 23 July 2011 <http://www.dailytelegraph.com.au/news/the-50-worst-carbon-tax-offenders-and-their-carbon-cost/story-e6freuy9-1226100061551>.

[36]PETA recognises that carbon taxes are currently levied on companies rather than industries, and the approximately 1.8 million tonnes of CO_2 mentioned is generated by several companies, large and small. The comparison of this amount to the large emitters gives some perspective as to the extent of the emissions caused by live export. But it should be noted that the large organisations involved in live export such as Australian Agricultural Company, Elders and Consolidated Pastoral Company as well as transport companies such as Wellard Rural Exports generate massive amounts of CO_2, of which live export is just one part. However, the exemption of agriculture from consideration for a carbon tax means that there are no reliable figures for the emissions of each of these companies, so it seems reasonable to consider the likely carbon tax liability of the live-export industry as a whole.

[37]News.com.au, "Ludwig as Bad as Drought, Say Beef Farmers", 1 Sept 2011 <http://www.news.com.au/breaking-news/ludwig-as-bad-as-drought-say-beef-farmers/story-e6frfku0-1226127558358>.