Ruminations

STORIES *of* LIVE EXPORT

NOVEMBER 2021

Contents

LiveCorp Chair, Troy Setter

LIVECORP
THE AUSTRALIAN LIVESTOCK EXPORT CORPORATION

LiveCorp is the service provider and research body for the Australian livestock export industry. It works closely with exporters and other stakeholders to continuously improve performance in animal health and welfare, supply chain efficiency and market access. Activities are funded through statutory levies on the export of beef and dairy cattle, sheep and goats, with matching Australian Government funding for eligible research spending.

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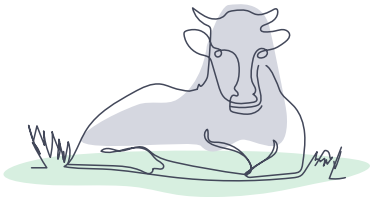


Welcome from LiveCorp

The people involved in live exports are as varied as the industry itself.

They're cattle producers and traditional owners on vast outback stations, sheep farmers in WA and goat breeders in NSW; veterinarians working for the regulator, and others who spend time at sea; export company staff in Australia managing logistics, and those checking compliance in feedlots and abattoirs overseas; as well as feed manufacturers, truck drivers, shearers, port workers, researchers and many more.

This magazine has been developed to tell some of their stories.

It comes after a survey of the Australian community about its views on live exports highlighted the need to do better at explaining how the industry works.

Feedback showed that while animal welfare is a concern for many people, they also recognise many of the positives about the industry. For instance, it provides jobs in rural and regional Australia, contributing to the national economy. Overseas, it provides food, clothing and employment, supporting many communities in developing countries.

Anyone involved in the supply chain will already have some insights into live exports. However, I hope there's something new and interesting for everyone in the following pages, to give you food for thought.

These are the human faces of the industry; the people who make it work and care deeply about the animals and their welfare. Enjoy the read!

Troy Setter
Chair
LiveCorp

Getty Images

An Introduction *to* Live Exports

Australia exported 1.5 million cattle, sheep and goats to 18 countries in 2020-21, worth a combined $1.6 billion – and that was in a year of high livestock prices and low supply as farmers held onto their breeding stock.

THE PRIMARY DESTINATION for beef cattle is Indonesia, followed by Vietnam. These are sourced mostly from northern Australia, where huge cattle stations are ideal for breeding, but don't have the right seasonal conditions to fatten them. This complements Indonesia particularly, as it has a lot of agricultural waste products from other industries that are ideal for feedlots.

Sheep for export are mainly sourced from Western Australia and destined for the Middle East. This trade is based on food security, as there's not a lot of land available for agricultural production. There are also cultural reasons for customers to prefer live animals in addition to buying a lot of chilled meat *(see article on pg 18)*.

Most people think of ships when they think of live exports. However, air freight is a small but important part of the industry. For instance, all goats exported from Australia go by air. It also allows the delivery of anything from a single animal to a full plane-load, and opens up export to landlocked countries *(see article on pg 12)*.

Live export is a highly regulated process. Exporters must comply with state-based regulations as well as federal ones – where a whole branch of the Department of Agriculture, Water and the Environment is dedicated to overseeing standards.

The Federal Government's Australian Standards for the Export of Livestock (ASEL) apply to both air and sea transport. They cover the selection of animals and their quarantine and preparation prior to loading, including several mandatory health checks. For voyages by sea, there are regulations about which animals can be penned together, how much space they have, how much food and water is available on board, the ventilation systems on the ships, and what medical supplies are loaded.

For some voyages, an Australian Government Accredited Veterinarian is required on board. There must always be at least one LiveCorp Accredited Stockperson, and for bigger ships there are several. They're responsible for looking after the wellbeing of the animals, and reporting on the conditions on the ship to the regulator. The crew of the ship also includes a team whose only job is the daily care of the animals, providing the feed and water and pointing out any issues to the vets and stockpersons *(see article on pg 08)*.

If the livestock are being exported to provide meat to people overseas, the Australian Government's Exporter Supply Chain Assurance System (ESCAS) regulations govern how they are looked after once they arrive, whether by sea or air. Australian exporters are responsible for their treatment and must

Photo supplied by Annie Hesse and the Arid Zone Research Station, Alice Springs NT.

> *The information will help individual exporters make better management decisions and increase transparency about the industry's performance.*

keep track of their movements until they reach an abattoir – even if they spend several months in feedlots first, and even though they no longer belong to those exporters or anyone in Australia *(see article on pg 16)*.

ESCAS doesn't apply to livestock exported for breeding, as they may live many years and have many owners. Australian cattle, sheep and goats are prized for their health and quality, to help countries improve the genetics or the size of their breeding herds and flocks. Some end up with smallholder farmers in developing countries to support food security, while the majority are bought by companies running highly sophisticated operations *(see article on pg 10)*.

Community views on live exports are mixed. Some people are strongly opposed, largely because of concerns over animal welfare along the supply chain. Others recognise the industry's contribution to communities in Australia and overseas. Many don't have a strong opinion either way. As with every industry, there are times when things go wrong, and people working in live exports have been equally horrified by media exposés.

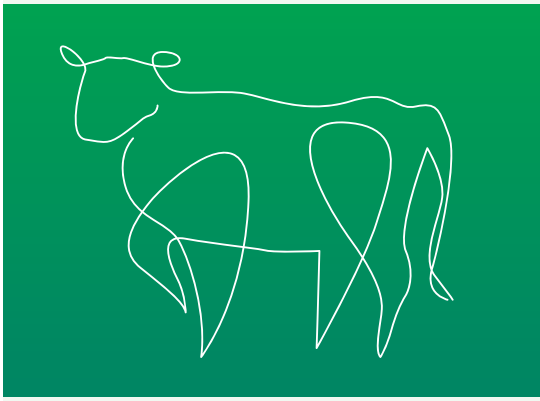
Animal welfare is the priority of the industry's research and development efforts; exporters have staff dedicated to overseeing every aspect of an animal's journey; training is provided on Australian standards and expectations before any facility overseas receives livestock, and they are audited regularly *(see article on pg 06)*.

On every ship, data is now being collected daily on a range of animal welfare indicators developed by the industry – a first for Australia's livestock sector. These measure the environmental conditions such as temperature, resources such as feed and water, and how the animals are behaving. The information will help individual exporters make better management decisions and increase transparency about the industry's performance *(see article on pg 11)*.

The industry is also making a difference overseas, exporting animal welfare along with the livestock. For instance, it is supporting the government in Vietnam to develop laws on the handling and slaughter of cattle that are consistent with Australian standards, which will apply to local cattle as well as those from Australia. ■

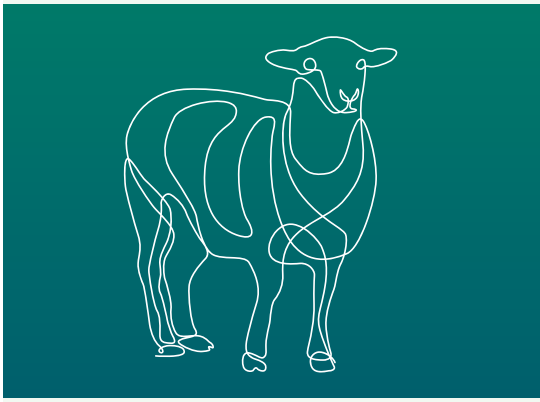
Australian livestock exports 2020-21

Source: Australian Bureau of Statistics



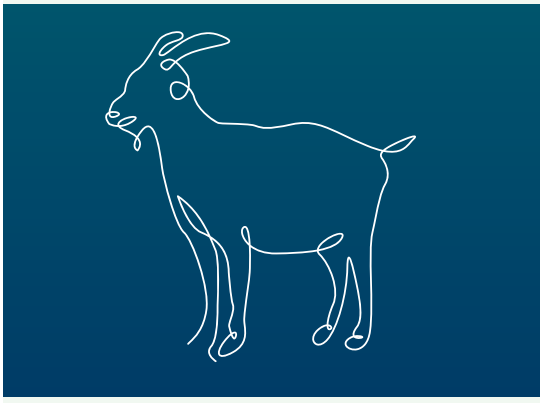
CATTLE

910,446 head = **$1.51 billion**



SHEEP

603,048 head = **$92.88 million**



GOATS

15,008 head = **$7.13 million**

Bronte Sutton with colleagues in a feedlot in Vietnam.

Living The Supply Chain Journey

The livestock export industry has been such a big part of Dr Bronte Sutton's life, that she and fellow cattleman, Pete, had one of their two wedding ceremonies on a live export ship.

"WE WERE ENGAGED and both working on the Sahiwal Express. The captain, who was a very romantic Filipino, was adamant on the last night of the voyage that he was going to marry us," Bronte recalls.

"The ceremony was longer than our formal ceremony back home. The crew all got dressed up in their whites and sang karaoke. It was very sweet."

It's one of the special moments Bronte has experienced in her career, which started in university and has led her to the role of Group Veterinarian for AgTrade, the parent company of exporter AUSTREX.

Bronte started out in the industry as a shipboard stockperson when she was still a veterinary student.

"I started doing live export voyages with Pete, who was already a stockie, and it grew quickly from there," Bronte said.

"I've been very fortunate to go on to have the complete supply chain experience, working in pre-export preparation, on ships, with air exports, and in Vietnam in 2015 and 2016."

Working in Vietnam at a time of rapid expansion in the industry gave Bronte valuable insights into the positive, life-changing impacts of live exports in destination markets.

"I was overseeing the health and production of the dairy and beef cattle AUSTREX were exporting into Vietnam, Laos and Cambodia, while Pete was supply chain manager for the area," Bronte said.

"Living and working long-term in-market as we did has been important to understanding the customers, markets and communities we are working with.

"We developed lasting friendships with our customers and other stakeholders, giving us better understanding of the cultural nuances, as well as better visibility and therefore positive impact into our facilities and supply chain.

"Most importantly, it's helped us truly understand the critical role live export plays in global food security and how quality live cattle supply is a very necessary part of that."

Now based on-farm in Central West NSW, where she and Pete also run a production animal veterinary practice, Bronte's role reaches beyond AUSTREX into other AgTrade companies, Paradigm Foods and ThriveAgri.

"My work varies, from working on R&D programs, to supply chain sustainability strategies, to strategic health and welfare programs and preventative measures, to advising on day-to-day animal health matters," Bronte said.

"Looking at live exports specifically, we have Australian Accredited Veterinarians overseeing preparation for each shipment as well as on board, and I have regular contact with them. If something is particularly challenging, I give them direct input into problem solving.

"We put a lot of work into preventative animal health. That's really the key goal, knowing the cattle have been prepared as well as possible before shipment. That means going above and beyond the protocols of the importing country and administering preventative vaccinations or supplements.

"AUSTREX exports beef cattle and an equal, if not greater, number of high value dairy breeder cattle from Australia and New Zealand. We also source cattle from a few other markets including Uruguay, and I have a lot to do with health preparation and management in those countries as well.

"We also air export elite, high value breeding stock from Australia and NZ including sheep, alpacas and goats."

Bronte administers the Group's Animal Welfare Committee, reporting directly to the AgTrade Board.

"The committee provides effective communication across our very large trade network. It comprises key livestock managers across AgTrade and our executive leadership, meaning we can share lessons and provide real accountability on animal welfare across what is now a very complex metric," Bronte said.

"Animal welfare has always been a priority, and how we communicate what we are doing has really matured.

"Monitoring and reporting on animal welfare is a big part of the industry, and we are very clear and transparent about what we do." ■

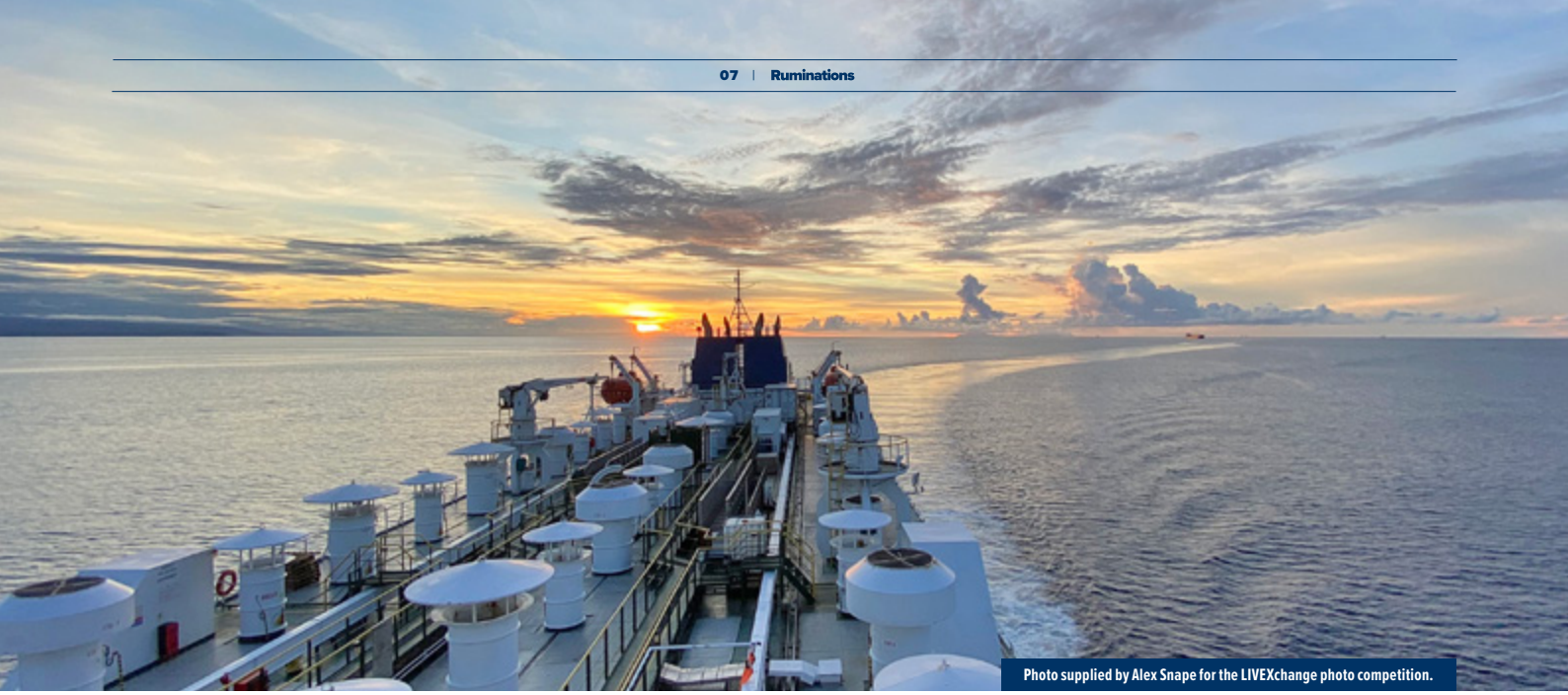
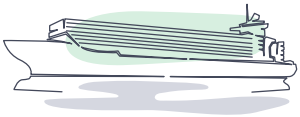


Photo supplied by Alex Snape for the LIVEXchange photo competition.

TAKING *the* HEAT



Just how many sheep or cattle are loaded on to a livestock export ship for transport to international markets isn't an arbitrary number but based on years of research that continues today.

UNDERSTANDING THE IMPACT of stocking density on the risk of heat stress has helped the industry make significant gains in animal welfare over the past ten years.

Heat stress prevention is taken very seriously by all stakeholders throughout the supply chain. There is no silver bullet, but a range of tools and management practices will continue to mitigate the risks.

The heat stress risk assessment (HSRA) model, for instance, was originally developed in 2002 to assess and reduce the risk of heat stress on livestock export voyages. It has grown increasingly sophisticated and is currently undergoing a significant revamp.

HSRA factors in the type, age and weight of cattle and sheep, the ventilation systems on the ship, and weather expected along the route.

An update currently underway will see the software and its underlying parameters shift to an online platform which can be updated as new data becomes available. It also increases HSRA's functionality to make it even easier for exporters to identify how many animals of each type can safely be loaded for a specific voyage.

Originally developed to help with planning for voyages to, and through, the Middle East, the HSRA has contributed to a significant improvement in animal welfare outcomes. Work is now underway to add weather and port data from more locations so it can be used for more voyages crossing the equator.

Trialling dehumidification units in Dubai.

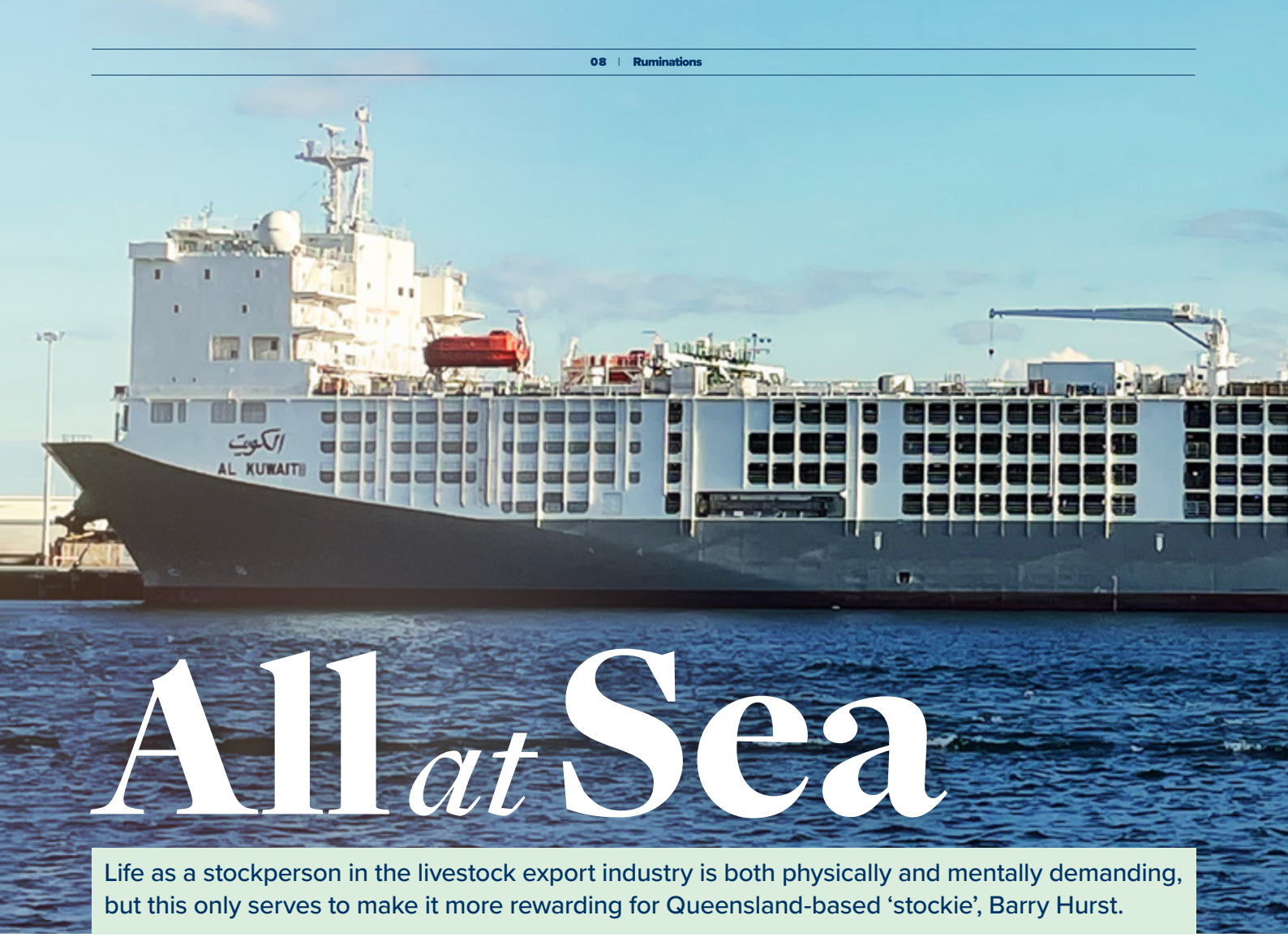
With humidity one of the key factors that can increase the risk of heat stress, the industry has also investigated the potential application of dehumidification technology on livestock ships.

Highly effective ventilation systems are currently used to blow fresh air through the decks on a ship and to draw heat away from the livestock pens.

LiveCorp ran a series of tests in the Middle East on an empty ship to evaluate the performance of dehumidification units in realistic operating conditions.

The trial showed the technology was effective in reducing temperature and humidity, but the number of units required makes it an impractical solution at the moment.

Data collected during the trial has been used to develop a theoretical model. As technology improves in coming years, it will help to assess dehumidification and air conditioning systems without the need to run further trials. ■



All at Sea

Life as a stockperson in the livestock export industry is both physically and mentally demanding, but this only serves to make it more rewarding for Queensland-based 'stockie', Barry Hurst.

BORN IN VICTORIA and now based in Biggenden, Queensland, Barry's background in the livestock industry has been varied, spanning time working with buffalo and scrub cattle in the Northern Territory, and a 10 year stint in Vietnam importing Australian cattle and beef products.

Barry's introduction to working on livestock export ships came just a few years ago. It was an interesting time, with significant community attention on animal welfare on board and associated pressure on the industry to demonstrate improvements in its performance.

As an accredited shipboard stockperson, his work starts with a day or two in the yards before the livestock are even loaded onto a ship and it leaves port.

"Loading and discharge plans and pen organisation are really critical and require a lot of teamwork between the stockies and the captain and chief officer," Barry said.

"Details of discharge need to be accounted for, then animals are basically loaded in reverse. If you put the time in to planning upfront, it makes loading and unloading far less stressful for the animals... and the humans!"

Keeping a close eye on livestock as they load and making regular checks throughout the voyage is one of the most physically demanding aspects of the job.

On one voyage from Western Australian to the Middle East, Barry used an app on his phone to track his movements and was surprised to learn he had walked nearly 150 kilometres across the nine decks of the ship from the time of loading to the time of discharge.

"Once on board, animals are fed and watered as soon as possible after loading, with water constantly available via automated systems in each pen. They are checked regularly, and any animal deemed to have an illness or injury is isolated in a hospital pen for even closer monitoring.

"Fodder, hay, chaff and water requirements are calculated daily. Temperatures, humidity levels and ventilation are other key factors we must keep our eyes on at all times," Barry said.

"With thousands of animals on board, it's a real team effort to make sure they have everything they need. The workload is shared amongst the stockies, the accredited vet on long-haul journeys, and the ship's crew – who are often very experienced in animal handling and know the ship's routine well."

Animal welfare outcomes are central to work as a stockie, and despite the challenges, Barry relishes the rewarding nature of the job when good outcomes are achieved for animals and exporters alike, particularly under trying circumstances.

Those circumstances have included the dramatic impact of COVID-19, which Barry has experienced first hand, including six stints in hotel quarantine.

"Before the pandemic, we would get off the ship at the destination port and take a few days to look around the country before flying back home. Having the chance to experience different cities and cultures in this way was a great part of the job," Barry said.

"Now, flight restrictions and quarantine requirements make the return journey more complicated, so often it's a choice between spending fourteen days in a small hotel room on return to Australia or staying on the ship for multiple voyages which can mean months at sea."

Perhaps most trying, however, was Barry's time on the MV Al Kuwait in 2020.

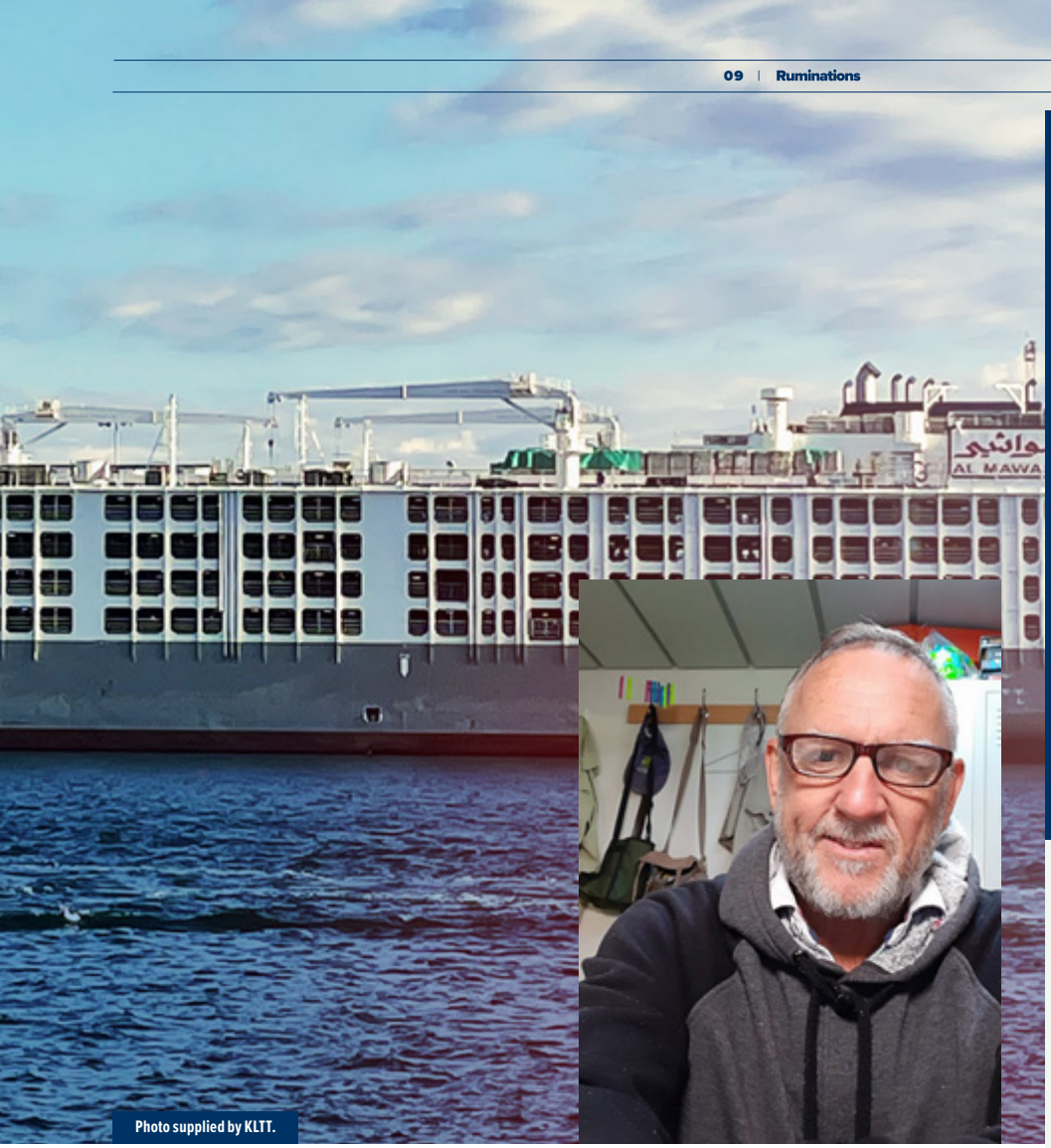


Photo supplied by KLTT.

After an incident-free trip from Fremantle to the Middle East to deliver both sheep and cattle, the Al Kuwait returned to reload just as the COVID-19 pandemic was escalating.

"About a week out from port some crew members became ill with fevers. Following strict protocols, the captain immediately notified authorities," Barry said.

"We didn't know for sure, but it was suspected the crew members were COVID-19 positive. We implemented procedures like staggering mealtimes and isolating in cabins to try to control the spread, but it was really challenging in the confined space of a ship."

Barry was spared, but all told, nearly half of the 45 people on board had contracted COVID-19.

The Al Kuwait was quarantined in Fremantle, which meant missing its scheduled departure before the moratorium on shipping sheep to the Middle East during the northern summer.

The animals were already in holding pens under quarantine and unable to be returned to farms. After a highly public debate, an exemption was granted to load for Kuwait with strict conditions, including reducing stock numbers to around 36,000 sheep and no cattle.

Despite the challenges surrounding the voyage, the accredited vet, Barry and the crew managed to achieve a record low mortality rate of 0.08 percent, something he attributes to careful selection of the livestock, and the availability of cutting-edge monitoring technology and animal welfare practices.

"We monitored environmental conditions like humidity and temperature, and had cameras on several decks, recording 24 hours a day," Barry said.

"We gathered data daily, and we set up a makeshift office on the top deck from where we uploaded the data and sent it back to the Department of Agriculture who were monitoring every aspect of the voyage.

"The experience with COVID on the Al Kuwait was pretty hairy at the time, but certainly makes for a good yarn now.

"To work with the team to limit the mortality rate the way we did, under such intense media, public and political scrutiny, was something I am proud to have played a part in and I think it shows what we're capable of as an industry." ■

Did you know?

Every livestock export ship must be stocked with a range of medicines and medical equipment to treat any cattle or sheep that fall ill.

Animal welfare indicators

In a first for any livestock industry in Australia, a standardised way to collect animal welfare data has been developed for livestock export ships, and is now being used to meet new reporting requirements.

A long-running research project conducted by Murdoch University for the industry identified a range of animal welfare indicators to help it move beyond mortality as a measure of its performance.

In 2020, a committee of animal welfare experts, veterinary epidemiologists, statistical experts, industry participants and those with practical knowledge of the on-board environment was established to fast-track the adoption of those indicators.

The project refined the measurements and developed data collection and analysis processes into industry protocols that could be practically and immediately applied on ships to demonstrate the welfare status of cattle and sheep.

The work fed into a review of the Australian Standards for the Export of Livestock (ASEL), and most elements in the protocols have been included in the ASEL 3.0 reporting standards. As a result, industry has largely implemented the collection of these animal welfare indicators.

JAPAN'S COW HEAVEN

In the picturesque landscape of Oita Prefecture at Kyushu in southern Japan sits Honkawa Ranch, one of the country's most productive and environmentally sustainable dairies.

FOR THE PAST 23 years, purebred Australian Holstein cattle have been integral to the dairy's success, with Australia its sole supplier of heifers.

Pioneers of Australia's dairy export trade to Japan, David Gardiner and Lex Crosby of Austock Rural facilitated the first shipments 30 years ago and have been sourcing and exporting heifers to Honkawa Ranch since the family first started buying Australian cattle.

Established in 1987 by Sumishige and Mitsue Honkawa, the dairy now milks nearly 2,200 head in its state-of-the-art facility, producing 22,000 tonnes of raw milk annually for major dairy processors in Japan such as Meiji Milk. It has been managed by their son and veterinary surgeon, Dr Kazuyuki Honkawa since 2010.

"When my parents were trying to expand their ranch, they used to purchase heifers at the Hokkaido market. But my father noticed that he was bothering other farmers because he bought a lot of cows and that caused the price to rise," Dr Honkawa said.

"At that time, a friend of Lex started importing dairy heifers from Australia to sell in Japan. He found Honkawa Ranch on a map, near where he was raising the cows, and came to see my father, who promptly decided to buy them all.

"It was a synergistically good deal in many ways, and a turning point for us. Since then, we have purchased cattle from Australia."

While dairy cattle were originally exported to Japan by ship, all those destined for Honkawa Ranch travel via air.

"In the early days, my mother went to Australia and selected the cattle. She conveyed to Lex the body shape she wanted, and that has worked very well," Dr Honkawa said.

"I returned to work for Honkawa Ranch and started managing in 2007. I went to Australia to buy cows, and Lex and David showed me farms in Australia and helped me to select the cattle.

"I learned I was able to identify the farms that didn't have specific diseases. The biggest attraction of the Australian farms we buy from is that the cattle are free from Bovine Johne's Disease, Bovine Viral Diarrhea and Bovine Leukemia Virus.

Dr Kazuyuki Honkawa (right) with his parents Mitsue and Sumishige.

"Of course, the milking volume and quality is important, and the quality and quantity of Australian cattle is very satisfying. Every year, we import 345 Holstein heifers on a chartered flight out of Sydney."

David said a lot of pre-testing of cattle was required before they were exported.

"Over the years, we've identified what we feel are the healthiest and best quality cattle. We now buy cattle exclusively out the New South Wales Riverina, Central Tablelands and Hunter Valley," David said.

"We've formed a very good relationship, and a trust and loyalty, with those farmers here in Australia who give us a good selection to choose from, to enable us to send the right animals to Japan on an ongoing basis.

"Lex has an excellent eye, and a very good understanding of what Dr Honkawa is after."

Lex is still sourcing dairy heifers from some of the farmers he started buying from nearly 30 years ago.

"We've got a really good team. The farmers, David and I, and the Honkawa family, have become a close-knit team, all working for the one cause," Lex said.

That relationship has proven to be particularly valuable since the COVID-19 pandemic began.

"I haven't been able to visit Australia to select the cattle in recent years, and so Lex and David have really been my eyes in Australia," Dr Honkawa said.

The Australian dairy heifers live a life in 'cow heaven' at Honkawa Ranch, according to Lex and David.

"In winter, the lowest temperature is -5 degrees Celsius and it snows. All grazing cows return to the ranch barn before winter," Dr Honkawa said.

"In summer, when the highest temperature is around 40 degrees and there is high humidity, we take all kinds of measures, including providing the cattle with supplements to keep them healthy."

Honkawa Ranch is also renowned for its commitment to environmentally sustainable practices.

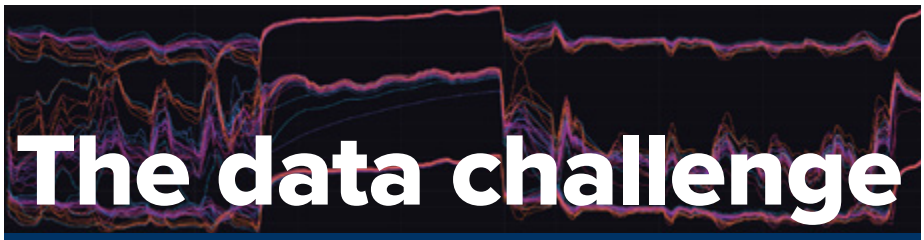
The flooring of its cow barns is carefully designed to prevent leakage of urine and manure to the outside environment. Every day, manure is cleaned out as fast as possible, while a specific level of dryness is maintained in the cow barns. These efforts also help to prevent mastitis and hoof disease.

Manure is taken to a compost mill, where it is fermented and turned into fertiliser.

All machinery in the milking chambers is thoroughly cleaned to maintain high standards of hygiene, from the raw milk pipes leading to the storage tank to the milking machines themselves.

All the fluids used to clean the equipment are sent through a specialised water-purifying tank, where it undergoes permeation membrane treatment before being ozone treated.

Through these processes, Honkawa Ranch turns soiled water into sterilised water, which is then re-used throughout the ranch. ■



The data challenge

As a highly regulated industry, the livestock export sector has long collected vast volumes of data. However, it has traditionally been labour intensive, in different formats, and hard to analyse.

HOW THE INDUSTRY collects, uses, and safeguards data is now a major focus for LiveCorp, the industry's research and development body. It is investing in ways to automate data collection and enable real-time monitoring of a range of factors affecting animal welfare.

Not only does good quality data allow analysis and provide a valuable tool to enable the best management practices are in place, it illustrates the performance of the industry, helping it be more transparent and underpinning its sustainability.

One of the biggest challenges in automating data collection is the lack of connectivity on livestock export ships. While digital sensors are being used on some ships, typically someone must walk to each sensor to download the data.

To tackle this issue, a global search for existing technologies was undertaken and three potential solutions identified.

One shipboard connectivity technology, a Bluetooth integrated Mesh network solution, has already been trialled on a voyage from Australia to South East Asia.

LiveCorp Senior Manager – Programs, Imogen Goode, said the technology was a success.

"Data measurements from environmental sensors set up around the ship were automatically extracted and transferred through the mesh network to a central computer on the ship's bridge," Imogen said.

"The computer interface screen on the bridge displayed the blueprint of the ship, showing the temperature and humidity conditions in real-time from each sensor on each of the decks. LiveCorp and our ship owner partner could also log-in remotely and see the data.

"Our next step is to do further validation on a bigger ship during a longer voyage, as well as test the other technologies we couldn't trial because of COVID-19.

"Collecting temperature and humidity doesn't require a high bandwidth, and we're also interested in seeing if the systems can handle integration with data collection apps, photos or even video, for potential use in the future."

Connectivity is just one factor in the industry's move to more sophisticated monitoring.

A key component in LiveCorp's efforts to streamline and improve the quality of information being collected is LIVEXCollect, a data collection, storage, and visualisation system.

The regulator approved the use of LIVEXCollect as the way for industry to meet its reporting requirements under the Australian Standards for the Export of Livestock (ASEL), from 1 November 2020.

LIVEXCollect tools are now being used across the industry to standardise data collection, from pre-export facilities, through to the planes and ships transporting livestock to export markets.

Data analysis dashboards are also being rolled out, providing exporters with access to their data in an easily interpreted form for the first time, to help with management decisions and drive performance.

"LIVEXCollect is about standardising data collection across the whole industry and ensuring we have meaningful, quality data that exporters can analyse, and we can analyse at an industry level," Imogen said.

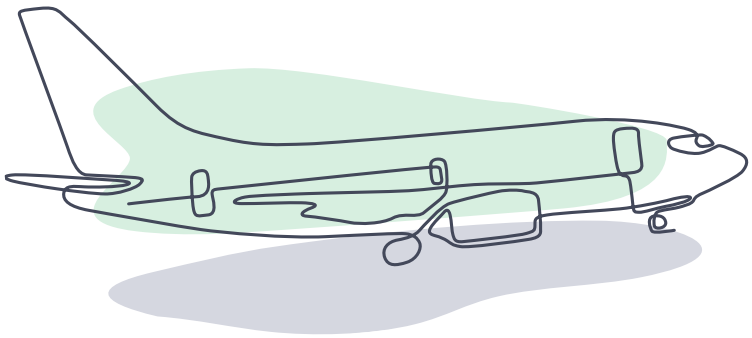
"For example, exporters will have access to consistent data to identify animal health and welfare trends, rather than relying on subjective observations as livestock move through the process."

While LIVEXCollect is currently a computer-based spreadsheet, LiveCorp has secured an Australian Government grant to develop a prototype app.

"Moving to a more digital platform for data collection means that we can also start to integrate more industry or commercially relevant data. We don't have to be restricted to collecting regulatory data," Imogen said.

With data comes the need for data security, and LiveCorp has developed an over-arching data governance framework.

"Everyone is very protective of their data and how it's going to be used. It's very important to LiveCorp that we have a system in place to protect the industry's data, and control who has access to it," Imogen said. ■



Up *in the* Air

Around half of the planes flying in and out of Australia, pre-COVID, had an animal of some kind on them, including passenger jets. While the majority were pets, there were between 200 and 300 flights a year exporting livestock.

AUSTRALIANS BUY SIGNIFICANTLY more from overseas than they export, so it used to be relatively cheap to put livestock on a plane that would otherwise be flying back almost empty. However, with passenger flights down to around 5% of pre-COVID numbers at one stage, demand for space on any plane has skyrocketed.

It can now cost up to USD $1 million to charter a plane to the northern hemisphere – double to four times the price of two years ago – with a full cargo plane carrying up to 1,500 sheep or goats, or around 400 cattle.

Livestock are loaded straight out of the truck from the farm into crates, which are then loaded into the planes. Most flights are under 15 hours in duration, and the industry is incredibly safe – all but a handful of animals each year make it safely to their destination.

Pilots are notified when they have animal cargo, to ensure environmental control systems are set correctly in the hold. An attendant employed by the exporter often travels on board, and an industry initiative making that mandatory will kick in once it's easier to get back from overseas, post-COVID. While it's not possible for personnel to check what's happening in the hold during the flight, they have an important role once the plane lands. This includes ensuring an auxiliary system is turned on once the engines are turned off, to keep fresh air circulating.

Air exports traditionally make up 3-4% of the total number of livestock exported from Australia. While it's a small proportion of the industry, it plays a vital role in many markets and has very low welfare risks. It's also the only way to reach many landlocked countries.

Versatility is a key benefit. It's ideal for high value breeding animals, with around 70% of flights carrying pregnant animals. Air export also caters to niche markets, with anything from one animal to hundreds making up a consignment. It can even help to open new markets for larger volumes once importers have first-hand experience of the quality of Australian livestock.

Sea voyages primarily carry cattle and sheep, with some buffalo from northern Australia to South East Asia. However, goats, deer, alpacas and even camels are also exported by air and regulated through the Australian Standards for the Export of Livestock. The requirements include strict veterinary checks before the livestock leave Australia, and sometimes parasite and other treatments to meet the health requirements of importing countries.

As an example, Malaysia has been the biggest market for air-exported sheep and goats, at one stage taking two full planeloads a week from Australia. The livestock go without food and water for some hours prior to and during the eight hour flight. On arrival, the crates are loaded straight onto trucks, and within two hours of landing the livestock are at the destination farms or feedlots, being fed and watered. Once empty, the timber from the crates is re-used as building material. ■

Did you know?

Livestock were exported by air from Australia to 27 different countries between 2016 and 2021, including New Zealand, Nepal and Canada.
In 2020, air exports included:

- 33,683 sheep
- 8,400 goats
- 6,411 cattle

Studying Welfare

Bonnie Mayes (left) with fellow PhD colleague Brendan Doyle and UNE Project Partnership lead researcher Dr Amy Tait.

When Bonnie Mayes enrolled in a Bachelor of Animal Science majoring in canine and equine studies, she couldn't have predicted that five years later, the welfare of livestock being exported on ships from Australia would be her focus.

ORIGINALLY FROM NEWCASTLE, Bonnie is undertaking her PhD candidature at the University of New England (UNE), leading large-scale experiments involving hundreds of sheep.

UNE has a four-year Project Partnership with the livestock export industry's research program, providing the science to develop new insights on stocking density, bedding and ammonia for live cattle and sheep export voyages.

Multiple trials involving both sheep and cattle are being carried out on land initially, to enable rigorous, controlled replication of experiments, before the findings are validated on livestock export ships.

Bonnie became interested in animal welfare research while studying Animal Science.

"I moved to Armidale in my final year of my Bachelor of Animal Science to undertake my Honours project in 2019, which was on the welfare implications of virtual fencing technology for sheep," Bonnie said.

"I thought once that was done, I would move back to Newcastle, but then towards the end of my Honours year, I started to find myself having discussions about continuing to develop as a researcher and potentially doing my PhD.

"As someone who comes from the coast, I didn't really have any idea about primary industries and the agricultural sector as such. When Dr Fran Cowley started talking about the live export project, I thought, hey that's one I am familiar with, because live exports have got quite a bit of attention in the media in the past and it's an interesting topic coming from a social perspective.

"I love the challenges associated with working on livestock export-related issues. I don't think a lot of young people realise the opportunities the industry offers from a research and career perspective – there's a disconnect, depending on what region you're from."

Bonnie has completed two major experiments as part of the Project Partnership and is now undertaking data analysis for both.

"The first experiment was at the CSIRO Chiswick research facility just outside Armidale and involved 720 sheep," Bonnie said.

"We were looking at the welfare implications of five different stocking densities, and then for half of the treatment pens we also restricted the amount of space we gave the sheep at the feed troughs.

"The experiment was conducted over a few months in late 2020. It was labour intensive and involved monitoring and feeding out half a tonne of shipper pellets every day, but it's the only way to get valid and reliable data.

"The second experiment in early 2021 was conducted at the Queensland Animal Science Precinct (QASP) climate-controlled facility. It involved using three stocking densities similar to those included in the first trial. We then imposed a temperature schedule on the sheep that mimicked the climatic conditions of a voyage to the Middle East, using data from an actual voyage during the northern hemisphere shoulder period.

"We were asking the question – how do sheep cope with different levels of heat and humidity at various stocking densities and how does it change their space requirements and impact their welfare?

"We had 216 experimental animals that we monitored 24/7, using surveillance cameras over each pen so we didn't continuously disturb the sheep. We'd split our days up into six- or eight-hour shifts, so someone would be there checking respiratory rates and keeping an eye on the sheep around the clock. It was intense, but we were really happy with the outcome."

Bonnie said while she never thought her university studies would take her down the animal welfare research path, she's glad it has.

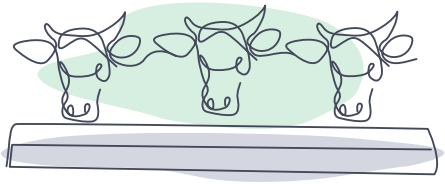
"From the get-go I found myself having to work a little bit harder because I didn't have the foundational knowledge about the different industries involved, but equally, I found it really fascinating," Bonnie said.

"I'm grateful I elected to go to UNE and study what I did because it has opened a countless number of doors and I'm certain there are more to come.

"I'll be finishing my PhD candidature in early 2023. The one thing that I am sure of is that I do want to further my experience as an animal welfare scientist. Any field of livestock welfare research where I feel I have the potential to make improvements to welfare and obviously be challenged regularly as part of my job role, I think I'd be really happy with. ■

The UNE Project Partnership activities are due to be completed in 2023.


CPC
CPC



A Scholar's View

When she packed her bags and left Indonesia in March 2020, Brooke Barkla was bound for the Nuffield Australia Contemporary Scholar's Conference in Brisbane.

FROM THERE, SHE would set out on the international research component of her Nuffield scholarship on the socio-economic impacts of the Australian live export industry in existing and emerging markets.

Instead, the COVID-19 pandemic took off and, with borders rapidly closing, the Nuffield travel was cancelled at the last minute.

Brooke hasn't returned to Indonesia, despite it being home for four years, working as Consolidated Pastoral Company's (CPC) Business Development and Performance Manager, based in South Sumatera.

Originally from a cattle property in south east Queensland and now based in Darwin, Brooke's a self-described jack of all trades. Her role with CPC covers everything from operational aspects of the business to profitability analysis, sales and import planning and cattle quality control both on arrival and departure.

"Our team in Indonesia continuously strives to meet the highest animal welfare standards," Brooke said.

"Across all aspects of operations from feeding, bedding, cattle handling, hospital treatments to processing facilities, they make cattle comfort and welfare their number one priority every day."

Awarded the Nuffield scholarship in 2019, Brooke's application was motivated by a desire to drill down into the direct and indirect benefits of the live export industry on the livelihoods of people, both in Indonesia and further afield.

"Obviously the live export industry is key to food supply into the region, but I'm really interested in the livelihoods that depend on our industry as well," Brooke said.

"Living and working in Indonesia has allowed me to see firsthand how integral the industry is to feeding, employing and supporting literally millions of people there and right around the world.

"Animal welfare is such a huge focus of the industry, as it should be, but the people involved in country are critical as well and a part of the industry that doesn't get as much attention."

In addition to the current socio-economic impacts, Brooke's research will examine the potential effects of any future transition away from importing live Australian cattle to higher volumes of boxed beef and cattle from other nations.

With plans to visit countries throughout Asia, as well as Brazil, India, Mexico and the Middle East, the COVID-19 pandemic has made components of her Nuffield research trickier than they might otherwise have been.

Brooke has also seen how the pandemic has posed challenges for all involved in CPC's operations in Indonesia.

"CPC employs roughly 600 staff in Indonesia, not including the broader supply chain roles like commodity and feed production, butchers and truck drivers," Brooke said.

"All told, there are roughly 12,000 families supported by CPC operations in Indonesia, and COVID-19 has had a significant impact on them.

"Culturally, the pandemic is changing the dynamics of how business is done. Social distancing doesn't come naturally to the Indonesian people, as they're often living and working in really close proximity to each other.

"Decisions are normally made collectively, through in-person discussion, so social distancing has led to big management changes as well.

"With impacts on shipboard staff as well, the industry and people employed within it have really shown their resilience by managing to proceed without any major disruptions, while keeping animals and people safe and employed." ■

"Culturally, the pandemic is changing the dynamics of how business is done. Social distancing doesn't come naturally to the Indonesian people, as they're often living and working in really close proximity to each other.

Dr Ismau Alim.

Did you know?

The Exporter Supply Chain Assurance System (ESCAS) applies from the moment Australian feeder and slaughter animals land in a destination market. It is based on four principles:

- **Animal welfare:** animal handling and slaughter in the importing country conforms to World Organisation for Animal Health (OIE) animal welfare recommendations
- **Control through the supply chain:** the exporter has control of all supply chain arrangements for livestock transport, management, and slaughter. All livestock remain in the supply chain
- **Traceability through the supply chain:** the exporter can trace all livestock through the supply chain
- **Independent audit:** the supply chain in the importing country is independently audited.

Supply Chain *Supervision*

AUSTREX* exports more than 100,000 head annually to Indonesia, its largest market for northern cattle. Its in-market team is crucial to ensuring high welfare standards.

VETERINARIAN DR ISMAU ALIM has been working in the livestock export industry since 2009 and today, is AUSTREX's Exporter Supply Chain Assurance System (ESCAS) Team Leader.

ESCAS is an assurance system regulated by the Federal Government which exporters are required to have in place for all feeder and slaughter livestock exported from Australia.

Based in Jakarta, Alim and his team are responsible for monitoring animal welfare for Australian cattle and buffalo from the moment they are unloaded from the ships to the point of slaughter in an ESCAS approved abattoir. They not only physically visit importers, feedlots, and abattoirs throughout Sumatra and Java to ensure ESCAS compliance, but provide training for people working in those facilities.

"Our focus has been on frontline workers who have direct responsibility for handling and slaughtering livestock, ensuring they're confident and have the skills and understanding to manage Australian livestock," Alim said.

Since ESCAS was implemented in 2011, Alim said the industry had undergone significant change. Not only has it improved animal welfare outcomes, but also developed efficiencies in the supply chain.

"It's so much easier, safer and more efficient for abattoirs to use restraint boxes and stunning. The process is much quicker now," Alim said.

"The butchers are also very happy with stunning, because they understand that if we're slaughtering cattle who are stressed, the meat is not as good. They understand now that good animal welfare also leads to a higher quality product."

Complementing Alim's role with AUSTREX is his involvement with the Animal Welfare Officer Forum (Forum AWO), a volunteer led organisation in Indonesia. This is a collaboration between importers, lot feeders and exporters, working together to ensure high standards of animal welfare are maintained.

"With Australian cattle being handled by more than 200 facilities throughout Java and Sumatra, we understand that when we work together through the Forum, it's easier for us to ensure compliance across the ESCAS supply chain," Alim said.

"Animal welfare improvements benefit everyone and so we share information and work together.

"We also coordinate training schedules, with AUSTREX workshops aligned with requests to the AWO Forum to deliver training in particular regions or facilities."

Australian-based Animal Welfare Assurance Manager Kari Moffat oversees ESCAS compliance in all AUSTREX destination markets.

"The work of Alim, his team, and the Forum AWO is critical, especially during COVID-19, when Australian exporters haven't been able to travel into market.

"AUSTREX is involved with a number of animal welfare projects in Indonesia, which Alim leads on behalf of AUSTREX. Implementation on the ground is a collaborative effort, with competitive export companies working together to achieve continuous improvement," Kari said.

"The touch and reach we have in supply chains on the ground is extensive because of the staff we have in-market. The pandemic has highlighted how critical it is to have a great, knowledgeable team in market to maintain relationships and provide support to our customers." ■

**Australian Rural Exports (AUSTREX) is one of Australia's largest livestock exporters and a pioneer of the trade.*

Did you know?

Producers retain 44-49% of the revenue generated in Australia by live sheep exports. Shipping operators get 18% and export companies 12% of the revenue.

Plan 'Bee' To Beat The Heat

The same technology used to monitor the temperature inside cartons of chilled meat is now helping to build an understanding of climatic conditions in feedlots in the Middle East.

THE CLOUD-BASED ROAM Bee system is being tested in an 18-month pilot being run by the Livestock Export Program (LEP*) in collaboration with importers of Australian sheep.

Data loggers, or 'bees', are strategically located throughout feedlots in Jordan, Oman, Qatar, Saudi Arabia and the United Arab Emirates. They record temperature, humidity, and GPS location against time (among other data) and upload the information in real time.

There is no hardware required, apart from placing the 'bees' in areas around each facility. A dashboard displays data in a user-friendly format ready for immediate analysis or review.

The aim is to provide importers with automated, real-time data; information which may support management decisions to minimise heat risk for Australian livestock in their care and ensure high standards of animal health and welfare.

The LEP's South East Asia Market Development Manager, Spencer Whitaker, was previously based in the Middle East and set up the project.

"Roam Bee technology is being trialled in a range of locations and climate zones, because the region has a lot of climatic variables. For example, the UAE and Qatar are hot and humid, whereas Jordan is hot and dry," Spencer said.

"The Federal Government prohibition on sheep shipments leaving Australia for the Middle East during periods from late May to mid-September, depending on the destination, covers the highest heat stress risk period of the northern summer.

"However, due to fluctuations in supply and demand there is potential for livestock to spend time in feedlots over this period if they are delivered from Australia before the end of May or start of June.

"Having the ability to monitor environmental conditions in real-time enables importers to make more informed management decisions."

Spencer said feedback from participating importers to date was positive.

"There is a high level of awareness in-market about community concerns in Australia regarding animal welfare, and importers are responding," Spencer said.

"Some of the importers collected climatic data before, but it has been a largely labour-intensive, analogue approach.

"This technology has reduced the workload of importers, as they can instantly see information from the office, rather than having to manually go around pens in feedlots and record temperatures.

"Results to date show importers are looking at the data daily and using it to make management decisions around things like reducing stocking density if they see increases in temperature and humidity or moving livestock into shaded pens if a heat event is forecast.

"Another bonus is that it enables importers to start building a heat and humidity dataset which might be useful in the long-term. They are aware of the focus on heat risk from the Australian public, animal welfare groups and industry, and just having the data to clarify conditions is valuable.

"In hot and dry climates some argue it's reasonably comfortable for the sheep over summer, and anecdotally, importers have expressed that for many years. Now, they will have the data to quantify conditions and back up these claims."

The Roam Bee trial is due to finish at the end of 2021. ■

**The LEP is a collaboration between LiveCorp and Meat & Livestock Australia, the research and marketing bodies for livestock exporters and livestock producers respectively.*

Viewing platforms at KLTT's abattoir.

LIFE LESSONS

For Osama Boodai, Chief Executive Officer of Kuwait Livestock Transport and Trading Company (KLTT), food security, culture and heritage are important for future generations.

IN PARTICULAR, HE wants to ensure children understand the origin of food, and the processes and animal treatment from farm to fork, rather than thinking it comes from the store.

KLTT is Australia's biggest customer for live sheep exports. The company is involved in the whole supply and value chain – it owns a fleet of livestock carriers, a feedlot, a state-of-the-art abattoir, and various butchery retail outlets in Kuwait.

At the abattoir, people can choose a sheep from pens and follow its progress via a panoramic viewing platform, through to the butcher who cuts the carcase into smaller meat cuts. It provides consumers with transparency and a very personalised experience.

"It is important that the younger generations understand that the sheep was created by God, to eat for the purpose of sustenance, so they should see it live and observe slaughtering of animals; it is a cultural rite," Mr Boodai said.

A qualified industrial engineer, he developed a passion and interest in live exports by chance, after working at KLTT for one of his senior projects while at Kuwait University. After graduation, Mr Boodai worked at KLTT and in several other industries before applying for his current position.

While Kuwait today is a world leader and one of the top ten oil producing nations, he says the country relies heavily on imports for food security, including live sheep.

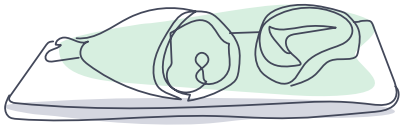
"After Iraq invaded Kuwait in 1990, food imports were disrupted. However, a single ship carrying 80,000 sheep arrived two days before this grim event. That shipment allowed the nation of Kuwait to be food secure for five months.

"Similarly in 2017 during the Qatar diplomatic crisis, the air freight shipments of 4,000 chilled carcases per day to Qatar stopped abruptly overnight when Emirates and Etihad were cut off. Once again, live exports were critical to ensure food security."

More recently, Mr Boodai said the COVID-19 pandemic weighed heavily on KLTT's ability to use air freight for chilled and frozen carcases, and live exports were a saving grace once again.

"Many years ago, Kuwait was a poor country. Our great grandfathers made a living by taking boats out to sea to fish and find pearls," Mr Boodai said.

"If you take children fishing, they learn that it's normal to kill what you catch and



take it home for dinner. I don't see this as any different to slaughtering sheep.

"We need to teach our children about what they're eating, and to thank God for it, so they understand and show respect to what they consume."

Mr Boodai underscored that all religions have their own customs and practices. In Islam, over and above the Halal law, KLTT is a pillar for vulnerable communities. It slaughters sheep for sacrifice and distributes meat to the poor.

"The use of sacrificial livestock remains embedded in Islamic culture, including for important celebrations and auspicious occasions. Live animals are needed for Eid Al Adha, our cultural customs when couples welcome newborn babies, and in general when special times are celebrated with family and friends.

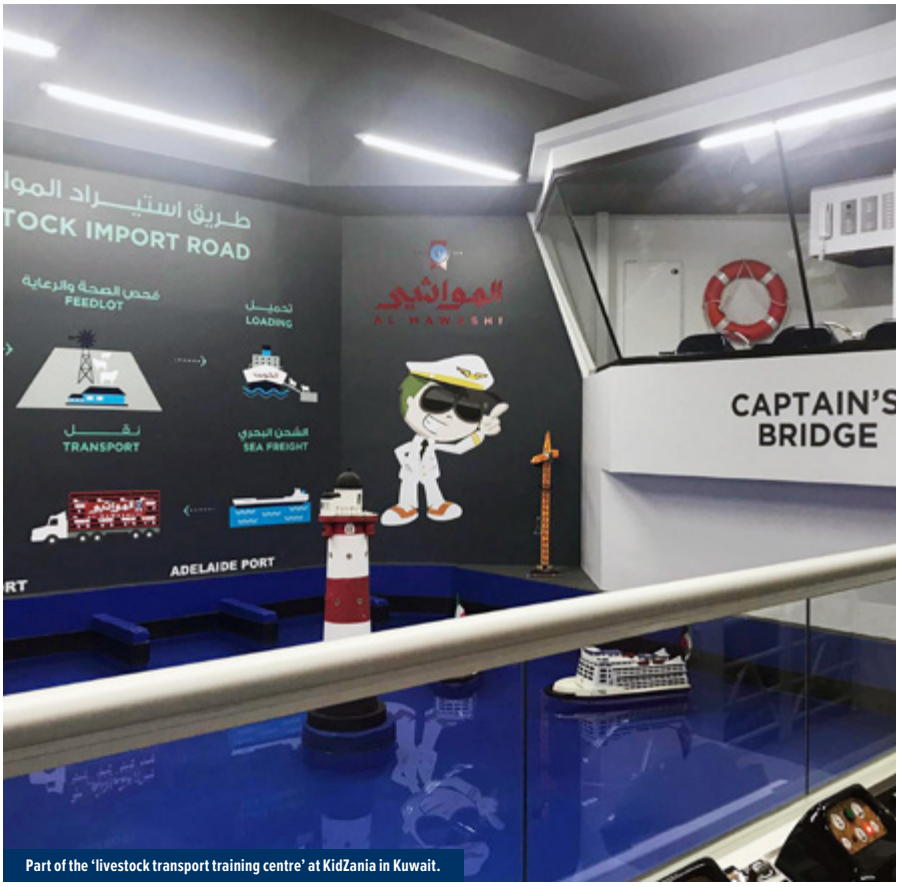
"It is of paramount importance that animal welfare is adhered to from farm to fork. KLTT has very strict guidelines in place to ensure adherence to the humane slaughter of sheep. It involves a single stroke across the throat with a very sharp knife, and the blood is completely drained."

Many cultures practice this form of animal slaughter, Mr Boodai said. In fact, the importance of the Halal sacrifice procedure is globally recognised, accepted and respected.

"During Eid, obedience to God is shown through sacrifice. Afterwards, we share the meat – keeping a third for ourselves, giving a third to family and friends, and donating another third to the poor. Through this Festival of Sacrifice, we demonstrate compassion and kindness to friends and even strangers," Mr Boodai said.

In addition to the importance of culture and religion, KLTT is also part of KidZania, a fun recreational park for children. The company has set up an attraction that educates children about live exports, how meat arrives in Kuwait and how much care is provided to animals that contribute to the country's sustenance.

"Children can be the captain of the ship, the veterinarian, or a crew member providing the feed or cleaning animal pens. We also have a butcher shop set up, where some children package up the meat, some take it home, and some take it to the KidZania supermarket for sale.



Part of the 'livestock transport training centre' at KidZania in Kuwait.

"These are interactive learning experiences allowing children to explore and understand the origin and journey of red meat from farm to fork."

Significant investments have been made in KLTT's real life feedlot over the past six years, and the company has spent around AUD$74million on a state-of-the-art abattoir.

While Kuwait gets hot in summer, it's a dry heat rather than being humid.

"The floor of the livestock pens is cooled by a watering system we've installed underneath, and pens have fans," Mr Boodai said.

"We have also better adapted the feeding system by importing the same pellets from Australia that are used on the ships to ensure sheep do not struggle to adjust with feed.

"Our system is fully integrated, and only animals from our feedlot go through the new slaughterhouse. COVID-19 has had an impact on meat distribution, and we have significantly increased and offered convenient online sales and home deliveries, rather than people coming to pick out their sheep at the abattoir."

All by-products from the abattoir such as hides, and offal are processed before being sent away for sale or rendering so there is no waste. In addition, all water is recycled and used for landscape irrigation.

Mr Boodai remains committed to his long-term goal: to increase local sheep production.

"We are discussing with experts to design a system to keep the sheep cooler, so the breeding is more successful. However, the population is also growing at rapid rate, so we will still need to keep importing sheep meat even if we are successful in developing a sheep flock for Kuwait." ■

Did you know?

Australian exporters are responsible for the welfare of livestock through to the point of slaughter, even after they are sold and arrive in other countries. This may include several months in a feedlot.

rumination

[roo-muh-ney-shuhn]

Noun

1. the act of pondering or musing on something

Understanding little of what was happening, I was semi-consciously storing away experiences, impressions, and ideas for later rumination.

2. the act or process of chewing the cud, as cattle, sheep, goats and some other animals do

Rumination helps cows efficiently turn grass and other feed into nutrient-dense milk.

Source: dictionary.com