Respondant: Adrian Baker BVSc, MACVSc (Ruminant Nutrition)

My experience is limited to shipping by one company, namely KLTT, and consequently to shipments to The Gulf. Sheep have constituted the majority of my involvement in live exports with a relatively small proportion of slaughter cattle and dairy cattle.

From 1988 to 1994 I was directly employed by RETWA (KLTT) for quality control and preparation of consignments for export from Portland, Adelaide and Fremantle. I accompanied two voyages to The Gulf. During the period I undertook the AQIS courses in Quality Management and encouraged the company to implement an internal Quality Management System but it was not the preferred option at the time.

From 2010 to the present I have travelled as an AAV to The Gulf on approximately 55 voyages, one on Al Kuwait, the remainder on Al Shuwaikh. Survival rate of sheep has exceeded 98% on all occasions and exceeded 99% on all but 5 occasions. 'Heat episodes' involving animal distress and losses have occurred twice. Reporting of performance on KLTT ships is subject to external reconciliation and audit.

One of the challenges for a review of the ASEL is the lack of practical validation of land-based research, previous standards and proposed standards. There is currently a shortage of relevant, robust research. Opinion-based recommendations dominate the current framework and these need to be superseded by practical evidence-based standards. The need for validation is a critical priority for the future of live exports. This implies the need for inbuilt flexibility to facilitate continuous review and improvement.

The live export trade is currently challenged to re-establish community confidence in our management of animal welfare. Unfortunately there is a shortage of knowledge and understanding of all phases (particularly shipping) of live exports and how they interact. Members of the public, exporters, researchers, AAV's, administrators and policy makers have consequently developed various conflicting opinions. Irrespective of this lack of consensus it is important to manage welfare from a holistic perspective rather than focus on a single issue such as heat stress/distress. Any welfare intervention will have welfare implications.

The live export trade might be considered as both housing and transport. Sheep and cattle have a remarkable ability to adapt to the novel conditions on board ships if provided with adequate resources. This is reflected in the overall outcomes of export voyages.

Objective measures of animal welfare appear to be fairly elusive. Survival remains the single defined outcome not subject to interpretation. When assessed from the perspective of the ASPCA Five Freedoms, I suggest that current welfare on livestock carriers is inadequately addressed primarily due to the single aspect of space allowance. In the context of transportation, provision of comfort, freedom from distress and expression of normal behaviour can all be facilitated by appropriate stocking density. An additional practical measure of welfare might be the capacity for all animals to assume sternal recumbency at one time; such observation still involves an element of subjectivity because not all individuals might choose to do so despite their ability.

3.1 Reportable Mortality Rates

The cause of the highest proportion of mortalities is 'failure to adapt to the export environment manifest as inanition'. Failure to adapt is more prevalent in older sheep (full mouth) and immature lambs (typically less than 32kg individual weight). Improved performance in the live sheep trade over the past 25 years has been due almost solely to decreased average age of consignments. 'Spike mortalities' in my experience have been due to a Salmonella outbreak (one instance in 8 years) and extreme ambient humidity (two instances in 8 years), both of which are difficult to predict. It is difficult to see how reduced RMR would provide a positive welfare or management impact.

Any change to the RMR for sheep would be opinion-based. It would however appear logical to reduce the RMR in line with reduced MR's. Hotter conditions typically advance the time of mortality of maladapted sheep (rather than heat stress per se) so it might be appropriate to consider 1% from October to May (discharge in ME) and 1.25% during the hotter months of June to September. It might also be appropriate to implement different benchmarks for specific categories of sheep (rams, ewes, lambs).

These benchmarks could be validated and reviewed following other changes to ASEL.

3.2 Voyage Reporting Requirements

Any additional reporting requirements should have their objectives clearly defined. They need to be practical and relevant. The recommendations of the McCathy Report could possibly be re-evaluated in 'the light of day'. For instance, any devices for real time environmental monitoring would need to be located in a meaningful, representative way and consideration given to practical contingencies such as cleaning with high pressure sea water. Panting scores and heat stress scores might be difficult to record when there are thousands of sheep of different classes with individual responses spread across various locations on multiple decks requiring a practical means of recording to be carried by a potentially sweaty operator. The reason why the 'existing reporting system is probably outdated' is not clearly defined. There has been limited response to reports in the past and any generation of extra material needs to achieve a meaningful outcome. Keeping treatment records for 10 years achieves what outcome? How is an AAV expected to make an objective assessment of the effectiveness of the ventilation system &/or its relationship to stocking density?

I suggest one of the best welfare indicators is the ability of all animals to assume sternal recumbency at the same time. If this observation is made it implies that space allowance is adequate and the animals are confined enough to adapt to human presence without fleeing.

I believe the export trade should be prepared to be 100% transparent. Concealment of information has been a perceived weakness in the past and not held the trade in good stead. We need to ensure mechanisms to allow both candour and openness in reporting.

4 Heat Stress Risk Assessment

Likelihood of heat stress is determined by temperature and humidity. Average climate records for locations in The Gulf conceal the extremes but are an indication of levels of risk. If average minima of 25°C and maxima of 35°C are considered as thresholds for assessment, June to September would be regarded as high risk with May and October of moderate risk. When relative humidity is taken into account May would be considered lower risk. Defining the northern hemisphere summer as May to October is not consistent with climate records for the region.

5.1 Sourcing *Bos taurus* cattle

Paragraph 1A 3.2 (c) (iii)

Bos taurus cattle are undeniably at risk during this period. Consideration must be given to conditions at destination as well as on board. I suggest it is inappropriate and unnecessary (there are cattle with Bos indicus content available) to subject unadapted Bos taurus cattle to a ME summer.

5.2 Shearing sheep

Off-shears sheep lose heat more readily by convection and are more heat tolerant. Freshly shorn sheep can move most freely in pens due to relative size and minimal resistance. In my experience, shearing cuts are not an issue. Sheep with significant wounds are removed at final inspection and small cuts on fleshy parts of the body heal well without complication.

Records indicate that I have accompanied 146,858 Awassi and Awassi cross sheep in 26 consignments to Kuwait at various times of year. I was surprised to see the suggestion that haired sheep should be shorn. I have always considered the adaptation of Awassi to shipboard life at all times of year to be quite remarkable. I have never felt that management or welfare has been compromised by their hair. I suggest the likelihood of a negative welfare impact if shearing was obligatory for ‘haired sheep’.

5.3 Maximum weight of cattle

I have accompanied only one consignment of heavy (580-650kg) slaughter cattle to The Gulf. They performed exceptionally well with no injuries or evidence of abrasive damage. They were housed with a generous space allowance. Very heavy cattle do need proportionately more space in which to lie down and rise. Heavy cattle are more likely to assume lateral recumbency with the inherent risk of legs protruding under railings.

5.4 Minimum time at a registered premise

A research group headed by Ann Barnes has been conducting research to determine time spent by sheep in the vicinity of feeders in assembly feedlots. At the recent Lambex conference an extension day was held for live exports at Wellard Feedlot. Ann revealed that conclusions drawn regarding preferred times in the feedlot had not been validated by

following sheep through subsequent steps of the export chain. This is a similar outcome to earlier research by Richard Norris' group.

Subjecting sheep to extra periods in assembly feedlots has welfare implications. Periods longer than currently prescribed in assembly feedlots are justified if they actually result in better welfare outcomes. Periods less than prescribed might however result in better welfare outcomes. The preferred period might vary with circumstances such as season. Extending the period held in paddocks increases the opportunities for spread of orally infectious agents such as Salmonella and coccidia.

It might be that stable cohorts of sheep have best welfare outcomes by loading directly to the ship from the farm of origin. Export ships are effectively feedlots similar in configuration to assembly sheds.
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Any recommendations need to be validated.

5.5 Inanition & Salmonellosis

Some individuals in any population (including human) adapt less well to novel environments (assembly feedlots, confinement feeding, jails, schools). Failure to adapt to the export system leads to shy feeders that are often difficult to identify even after several weeks. They tend to hide amongst the group. They often lose minimal body condition over more than a week and are full of gas or water to the point of death. Failure to eat can be partial rather than absolute. When shy feeders can be identified and segregated for care it is clear that the syndrome involves behavioural aberrations (often bullying) so it seems logical that an effective intervention will be difficult to find. It is conceivable that 'shy feeder' problems could be reduced by increased space allowances.

Feeding initiatives for management of inanition are problematic at the group level. For instance, use of chaff to stimulate eating in problem pens often promotes aggressive feeding by strong sheep and further marginalises shy feeders.

I suggest that Salmonellosis was a major issue when consignments of old wethers dominated live sheep exports but it is now of minor impact. I have experienced only one outbreak of Salmonellosis largely confined to two lines of young wethers from Portland about five years ago. I am sure there are odd cases on every voyage but I currently see very few cases of enteritis (shy feeders often scour but have no evidence of inflammation). I suggest that a Salmonella vaccine would have more negative health and welfare implications than positive. I suspect there are less carriers in younger sheep and improved management at assembly feedlots allows less chance for transmission.

5.6 Pregnancy test requirements

In the past several years there have been very few lambs born on board. Any births have largely been confined to (misplaced) 'wethers' and precocious lambs. I am not sure why Damaras deserve special mention. I consider management of pregnancy in sheep to be very well managed.

6 Stocking densities

Determining space allowances based on allometric principles appears to be a reasonable starting point but standards need to be validated. Excessive space allowances have welfare implications: animals fail to settle, manure pads do not stabilise, feed and water troughs are soiled.

It is obvious from the wording of the Issues Paper that this is an area that is far from resolved ("appears to be"). The science does not "appear to be" very robust.

I would try to keep the system as simple as possible. Focus on minor issues such as weight gains and curfews could distract from the major issue of getting general space allowances right. Management of seasonal conditions and cohorts needing special attention to minimise risk would seem to be more critical.

I believe that under favourable environmental conditions the optimum space allowance is achieved when all animals can assume sternal recumbency with little or no extra space. Most animals tend to be habituated to do the same things at the same times (eat, drink, rest, socialise) and this space allowance accommodates those requirements. Particular circumstances requiring additional space can be defined (old sheep, fat sheep, heat, etc) and subsequently validated. I agree with Mike McCarthy that this needs more work.

Anticipated liveweights supplied to a ship prior to loading determine the loading plan. These can never be entirely accurate because sheep have been drafted into various categories. To demonstrate credibility it is critical that spot checks over an independent weighbridge be implemented to determine the veracity of the actual weights supplied by the exporter.

7.1 Bedding and ammonia levels

I consider that amendment of the manure pad for sheep is impracticable. If ventilation is adequate and space allowances appropriate there should be no need for amendment of the pad.

Ammonia levels have never appeared to constitute a problem. Appropriate protein levels in feed, a stable manure pad and adequate ventilation should circumvent any problems.

7.2 Water and Fodder

Quality, quantity and access to water and fodder have never appeared to be a problem on KLTT voyages. In my experience, usefulness of chaff for sheep is generally limited to individuals that can be identified and segregated for special attention.