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11th Boehringer Ingelheim
Expert Forum

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Farm animal welfare standards and international trade



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Science shows that when farm animals are not just healthy, but also free of pain and discomfort, there are far-reaching positive consequences.

At Boehringer Ingelheim, we believe that vets play a key role in promoting better farming practices. Our aim is to build and share scientific knowledge around farm animal well-being, where effective pain management benefits livestock and rewards farmers, while satisfying the social demands for responsible farming.

Because farm animal
well-being **works.**



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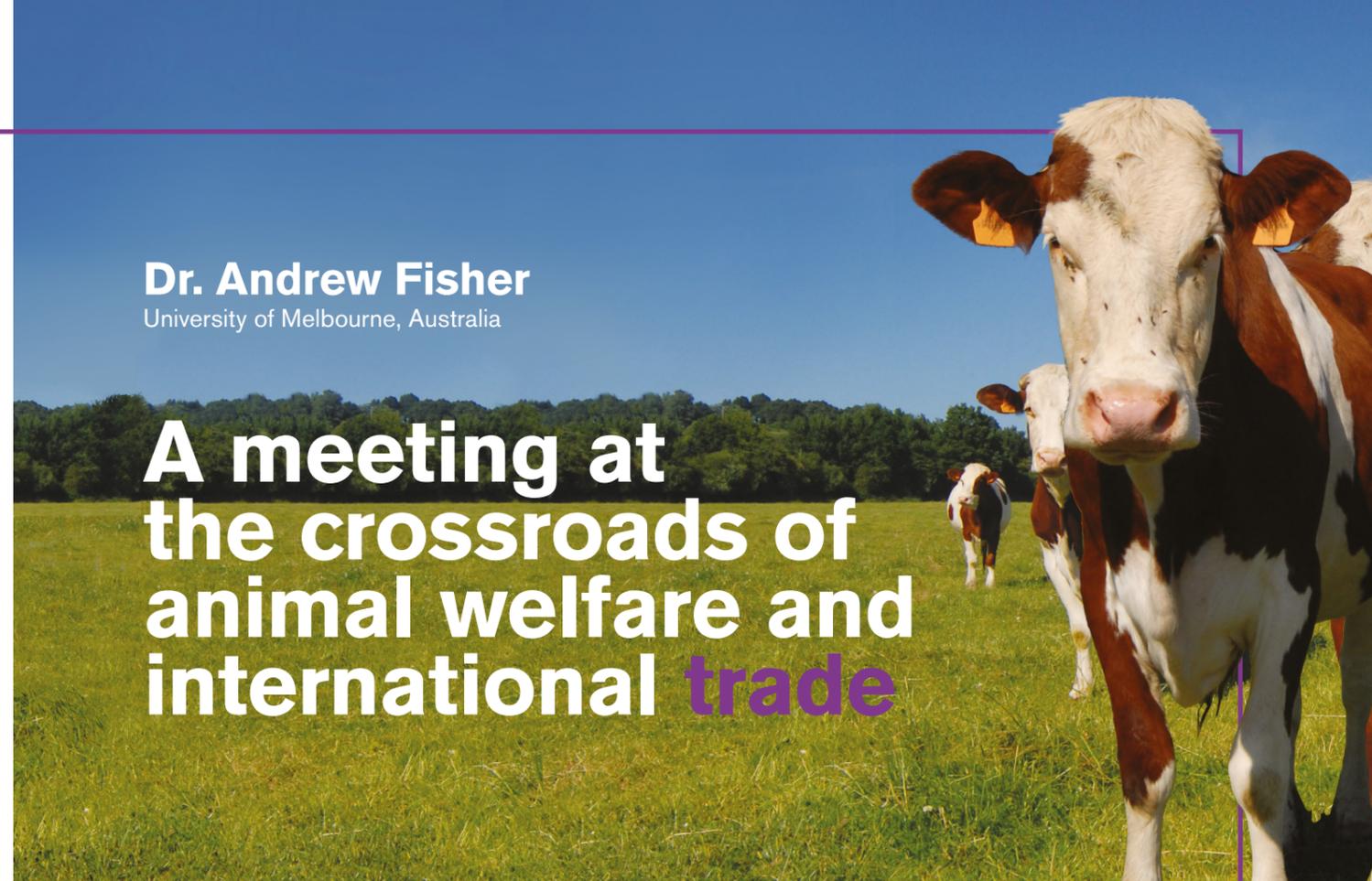
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Andrew Fisher graduated as a veterinarian and worked in practice in Colac in Victoria and in northern England. After a PhD in beef cattle health in Dublin, he worked for five years with AgResearch in New Zealand, conducting research aimed at improving dairy cow management and beef cattle and sheep welfare. In 2002, Andrew joined CSIRO in Australia, and researched practices for pain management in farm animals, livestock transportation and improved measurement of animal welfare. At the start of 2009, Andrew took up a position at The University of Melbourne, and in 2011 he was appointed Chair of Cattle and Sheep Production Medicine. He is currently also the Director of the Animal Welfare Science Centre, and conducts research, with a focus on farm animal health and welfare. Beyond his research and teaching, Andrew was on the writing group for the OIE's international beef cattle animal welfare standards, and the writing groups for Australia's land transport and sheep welfare standards and guidelines.



Dr. Andrew Fisher
University of Melbourne, Australia

A meeting at the crossroads of animal welfare and international trade

Historical perspective

The philosophical position of animals in society has been the subject of human discussion since ancient times. During the Age of Enlightenment in the 18th century, contrasting positions on the capacities of animals were symbolised by the views of the philosophers René Descartes (without contrary evidence, animals should not be assumed to be more than unfeeling “automata”) and Jeremy Bentham, who argued that animals could suffer. In the 19th century, the debate moved on to whether animals should be granted a degree of protection against suffering. In 1822, Richard Martin pushed for the first anti-cruelty bill in the UK parliament, which granted protection for cattle, horses and sheep. Although, for many at the time, the idea of compassion for animals was seen as a bizarre concept, the formation of what became The Royal Society for the Prevention of Cruelty to Animals (RSPCA) soon followed, in 1824.

During the past century, community views on animal welfare have moved from being concerned only with acts of wanton cruelty toward animals, to concerns about standards of animal care. An area of focus of this public concern has been systems where animals are kept for profit, such as agriculture. Intensive farming systems, where

animals are managed in man-made environments, have received particular attention from animal welfare interest groups, and were the subject of the first farm animal welfare campaigns and regulatory scrutiny during the 1960s and 1970s. This public interest has now spread to other forms of animal agriculture. Although non-western societies may not place as much emphasis on animal welfare in farming, the broad trend is likely to be similar, and producers still need to be mindful of the attitudes of the society in which they farm, as well as those they export to.

What is animal welfare?

It is probably under-recognised that the concepts and definitions involved in animal welfare provoke almost as much debate among people directly working in the field as the welfare issue does within society at large. Many people prefer to differentiate between defining animal welfare as a concern for the highest standards of care for animals, and animal rights as a philosophical concept that translates into an avoidance of the utilisation of animals. Within the animal welfare spectrum, some concepts act essentially as checklists that may be used as screening tools, or to support “tick-box” welfare assurance. The UK's Farm Animal Welfare Council's



“Five Freedoms” are an influential example. The Five Freedoms incorporate elements relating to nutrition, health, normal behaviour, comfort and psychological stress of animals.

The Five Freedoms

1. Freedom from thirst, hunger and malnutrition
2. Freedom from discomfort
3. Freedom from pain, injury and disease
4. Freedom to express normal behaviour
5. Freedom from fear and distress

More complex models of animal welfare attempt to understand what constitutes normal levels of these welfare components, and what the consequences may be for the animal if they are not normal. The most widely-utilised concept views animal welfare as an optimal condition of the animal's biology. An alternative model of animal welfare argues that how an animal feels is the prime determinant of its welfare. A third concept, as championed by the philosopher Astrid Lindgren, places great emphasis on the naturalness of a production system. More recently, we have begun to understand how to integrate animal feelings with their biology, and to examine the ‘naturalness’ of a system in terms of either its effect on the animals or its effect on human attitudes and perceptions.

Where are we now?

In response to such questioning by the public and animal welfare advocacy groups, the response of governments and animal industries has been firstly to clarify and strengthen the regulatory system underpinning animal welfare obligations in western countries. This has typically involved moving beyond enforcing avoidance of cruelty to requiring farmers and other animal owners to fulfil basic obligations of duty of care, such as sufficient feed, water, shelter and healthcare. However, regulatory approaches are best used

to provide a lowest common denominator, and to enforce and prosecute those who fall below this minimum standard of care. In order to more effectively address the animal welfare expectations of the general public and consumers, there is a requirement for the development of animal welfare measurement, improvement and assurance.

There are three arguments commonly presented for animal production industries to engage with the welfare issue. These are: 1) Protection/enhancement of markets; 2) Assistance in dealing with the regulatory environment; and 3) Improved production and profitability through reduced animal stress. Essentially, the standards of husbandry and welfare practised during animal production are becoming important factors influencing consumer perceptions in many markets. Clearly, the use of welfare-unfriendly practices has the potential to downgrade product quality in two ways. There may be loss of physical quality, such as meat tenderness, from animal stress. Secondly, the welfare practices used to farm animals and produce animal products are becoming a quality attribute in their own right for consumers. Furthermore, the use of practices that initiate market or public concerns that are unable to be adequately addressed may cause damage to the image and marketability of animal industry products.

In reality, advances in animal health and management mean that the absolute level of animal welfare in modern production systems is better than in previous times. However, public concern about animal welfare in farming has intensified. Ongoing or emerging animal welfare issues for today's production systems essentially have the following components:

- i. confinement or restriction of movement;
- ii. surgical husbandry practices that may cause pain;
- iii. long-distance transport of animals for economic gain; and

- iv. diseases or problems induced by the production environment.

Where do we need to get to?

The challenges of different values and practices globally because animals and animal-derived products may be marketed across sovereign borders, and because of the global reach of media, the assessment, assurance and regulation of animal welfare has international connotations. The OIE (the world organisation for animal health: www.oie.int) has developed animal welfare standards for all the major farmed species (including farmed fish). These standards are intended to support the development of animal welfare oversight in countries where this has previously been minimal, and to serve as a basis for agreed animal welfare standards in international trade. Because OIE standards are intended to be implementable even in jurisdictions with limited resources or levels of national development, the public and consumers in more developed countries may have higher expectations of animal welfare.

Another challenge relates to the unfamiliar being perceived as more of a risk to animal welfare than the familiar. As an example, using the country where I am based, Australia is arguably well-placed to address the interest of the modern consumer in the animal welfare standards of farming practices. There are regulatory systems in place, supported by professional state veterinary services. Furthermore, many of Australia's dairy, beef cattle and sheep production systems, by their nature, conform more easily to public perceptions of how animal farming should look. The flip side is that Australian extensive livestock production environments have required the development of practices that in some cases are relatively unique to Australia's geography and conditions (such as mulesing), or that are performed differently, such as the need to truck animals for relatively long distances. Where Australian practices are different from those of other farming industries elsewhere, it is possible that they will come under greater welfare scrutiny, or appear more

problematic to the external observer. Conversely, the use of animal confinement to ensure nutrition and thermal comfort during higher-latitude winters would appear alien to many Australian observers.

Animal welfare itself is not a ‘phytosanitary’ justification for government-based restriction of trade under WTO rules. However, adverse animal welfare evidence or perception can directly damage the marketability of animal-derived products exported to welfare sensitive markets internationally.

To meet these challenges requires us to focus not on the optics of the management practice or the farming environment, but on the welfare of the animals themselves. In animal welfare assessment and assurance, there is increasing realisation of the relative importance of animal-based measures in comparison with resource-based or management measures. Furthermore, as we move forward, we need to address not just the animal's physiology, but also its emotional state, given that our major mammalian farmed species are recognised to have the capacity for mental as well as physical experiences. This extends into a need to understand both negative and positive emotional states, as outlined by Natalie Waran in her paper.

Conclusions

Unless there is a severe economic downturn, social upheaval or environmental challenge that threatens the global security and production capacity of animal-derived foodstuffs, it is almost certain that the need to address animal welfare concerns within animal production systems will remain and grow. However, because of this, it is likely that animal welfare will become less of a separate issue, and simply become part of ‘how things are done’. In this scenario, the controversies and associated market risks may decline. The task will be about ensuring animal welfare standards and providing assurance through animal-based measures that provide for equivalence of animal welfare outcomes, regardless of the particular production setting or location used.



Professor Natalie (Nat) Waran
Eastern Institute of Technology, Napier, New Zealand

Nat gained a first class Zoology degree from Glasgow University, and PhD from Cambridge University's Veterinary School funded by the British Veterinary Association. She joined Edinburgh University in 1990 to develop a unique PG Masters in the relatively new area of Applied Animal Behaviour and Animal Welfare. She first moved to New Zealand in 2005 as Professor of Animal Welfare, Head of the School and an Associate Dean (Research) at Unitec Institute of Technology. She returned to the UK in 2011 to take up the position of inaugural Director of the Jeanne Marchig International Centre for Animal Welfare Education based at Edinburgh University's Veterinary School, where she was also the International Dean. In late 2016, she joined the Eastern Institute of Technology (EIT) as the Executive Dean for the Faculty of Education, Humanities and Health Science and Professor of One Welfare.



Professor Natalie Waran
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Looking on the bright side of life

Positive emotions and why they matter

Arguably, the field of Animal Welfare Science emerged following publication of the 'Brambell Report' in the UK in 1965, after which the UK Farm Animal Welfare Council was born, and the ubiquitous 'Five Freedoms' emerged. In 1967, Professor Brambell in addressing the first meeting of the Society for Veterinary Ethology (now the International Society for Applied Ethology) held in Edinburgh, stated that 'any sufficient estimate of an animal's welfare must be based on an understanding of the ethology of the species, as well as the very difficult question of what an animal feels'. Over the past 50 or so years, input from various eminent ethologists, physiologists and veterinarians have helped shaped the field of animal welfare, through the development of research questions and methodologies, as well as most importantly discussing and agreeing a definition of animal welfare. In moving beyond those original Five Freedoms, there is now agreement that welfare or well-being is a multidimensional phenomenon based upon life experiences and circumstances, characterized by how an individual animal feels as well as how it functions.

We have come a long way since the early

research studies, where animal welfare assessment was focused mainly on production animals with the core driver for change being associated with improving farm animal health and production. At that time, assessment of animal welfare involved measures of physical health, changes in behaviour and physiology as indirect indicators of negative emotional states such as pain, fear and stress and production measures such as reproductive success, food conversion efficiency, growth and product quality. More recently there has been a growing awareness of how welfare state can range from bad to good, and that good welfare is not simply the absence of disease or negative experiences, but also the possibility for, and presence of, positive emotional experiences such as pleasure and even happiness.

Alongside developments in the way in which scientists assess welfare, there has been increasing societal concern, and consequently pressure, on the livestock industry to enable animals to be able to experience what has been termed 'a good life', and not simply a life worth living. Recognizing the significance and meaning of emotional responses, and then disseminating research based information for promoting opportunities for positive experiences for farmed

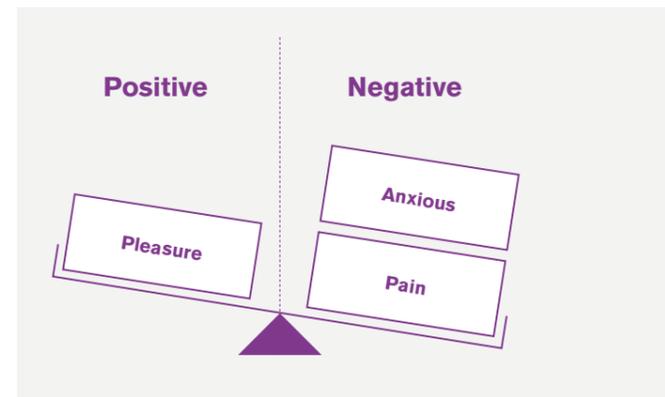
Positive emotions and why they matter

animals is therefore necessary if we are to achieve this objective. Information regarding the characterization of animal emotional responses and how these relate to biological functioning and ultimately survival, has led to new approaches to understanding the world from the animal's point of view. Essentially, the emotional impact of the animal's immediate or past experiences will effect subsequent behavioural motivation, determining whether the animal approaches or avoids a stimulus or situation. Approach behaviours are generally indicative of expectations of positive outcomes, linked to reward seeking and positive appraisal of stimuli; whilst avoidance behaviours orient the animal away from aversive stimuli and the threat of negative consequences.

Researchers have devised complex tasks for farm animals to perform to identify what they are motivated to avoid, as well as what they want and how much that resource means to them. The results of such studies have been used to inform operators of the emotional valance (meaning) to the animal of various practices and situations typically experienced by farm animals and therefore the welfare implications.

Making animal emotions accessible is arguably the basis of research into subjective judgements about an animal's emotional state based on animal body language (or animal behavioural expression). Through the use of free choice profiling methodology developed by Wemelsfelder et al. (2001), it has been possible to validate lists of species specific behavioural indicators of different emotional states so that a "Trust your Eyes" approach to welfare assessment in the on farm situation is a real possibility.

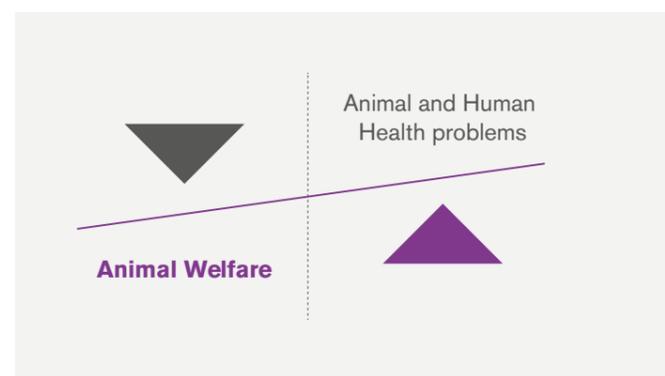
What we do know, is that providing animals within farming environments with the opportunity to perform highly motivated behaviours, to avoid negative experiences and to anticipate and experience positive consequences, as well as to have some control and predictability within their housing, handling or transport situation, will ensure that the risk of negative mental states is reduced and positive emotional states are more likely. So whilst the concept of positive emotions such as 'happiness' has been studied very little in animals, recent work suggests that animal happiness could be defined as consisting of both positive emotions and positive activities. Such reliable indicators of positive emotions, may include the presence of behaviours such as play, as well as



increases in comfort and affiliative behaviours.

Ensuring best practice in farm animal care and management relies on getting the balance weighted more favorably towards increasing positive and reducing negative emotions, such that the animal is in a good welfare state.

This goes beyond an ethical obligation since it is also a significant factor in safeguarding public and environmental health. At the level of the individual animal, it has been shown that animals in a poor welfare state do not perform well. Research has shown that poor animal health and lower production can be directly related to sub-standard animal management, handling, transport and/or housing conditions. Physically and/or mentally stressed animals have been found to be more susceptible to disease, and the use of antimicrobial drugs has facilitated concern regarding the emergence of drug-resistant microbes, and an increased threat of a spread of resistance from animals to humans. Alongside this, is a growing body of evidence that improvements in standards of animal welfare can have both a direct and indirect impact on



food safety as well as productivity, and public health outcomes (see Waran 2012). By contrast, enhancing Quality of Life by adopting practices and environments that support more positive affective (emotional) states, will ensure animals do not divert valuable energy for coping with stressful situations ensuring that they are healthier, more disease resistant and more productive.

In conclusion, although typically the scientific study of animal welfare, involving measurements of an individual animal's quality of life has been seen as separate from the ethics of animal use and treatment, there is increasing acceptance that both are inter-connected. Devising objective, validated and practically applicable measures of an animal's mental state, including both negative and positive emotions is a difficult task, probably because physical and production related factors tend to be more accessible, measurable

and consequently viewed as more objective. Regardless, it remains imperative, if the farming industry wishes to maximize animal welfare and maintain customer confidence, there is a need to promote an understanding of the importance of increasing opportunities for positive mental states and activities, and adoption of practices that reduce the risk of negative emotions within the various environments and systems that are used for rearing and management of livestock.

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Grahame Coleman is currently Professor in the Faculty of Veterinary and Agricultural Sciences, at the University of Melbourne and is a scientist in the Animal Welfare Science Centre. Professor Coleman has published over 130 journal articles, numerous book chapters and one book.

His research interests focus primarily on human characteristics, including attitudes, that are relevant to human-animal interactions in the livestock industries. This led to the development of a sequential causal model that explains the pathway from human beliefs, human behaviour, animal behaviour and animal productivity and welfare outcomes and the development of interactive educational and training programs for stockpeople. More recently he has studied community attitudes to farm animal welfare and the impact of these attitudes on community behaviour and on license to farm.

Professor Grahame Coleman
University of Melbourne, Australia

Public attitudes, perceptions and behaviours towards farm animal **welfare**

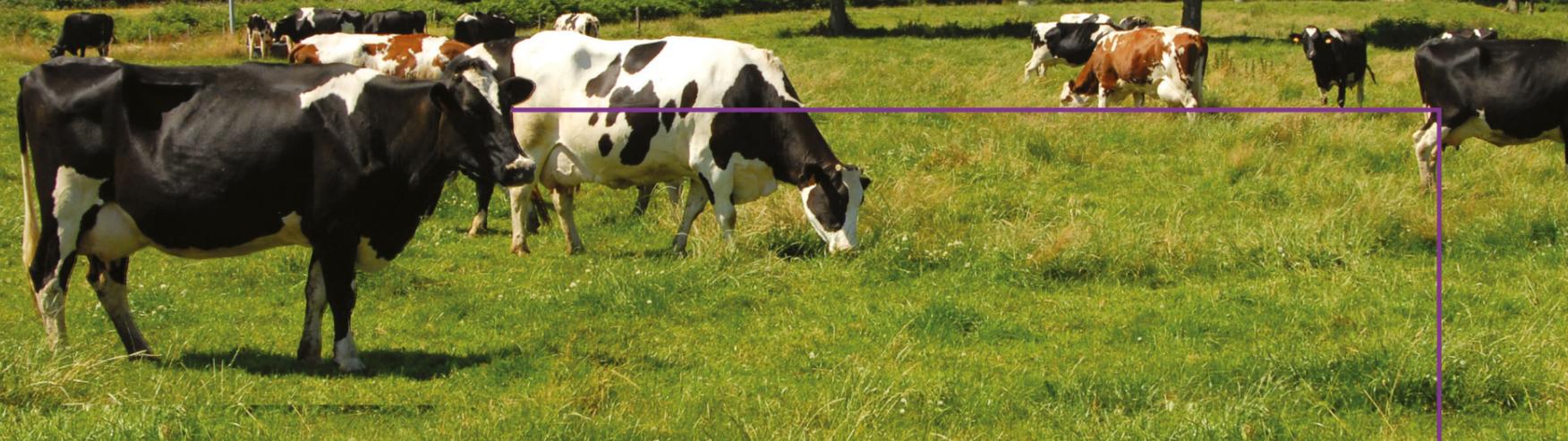


Farm animal welfare attracts public interest in Australia whenever there is an adverse event reported in the media detailing animal cruelty in abattoirs or seriously compromised welfare during live sheep transport by ship. Such events lead to discussions by stakeholders (including animal rights groups) in social media, in the mainstream media, in the relevant industry bodies and within government. In addition to these episodic discussions, there is a background awareness of animal welfare that emerges as part of marketing strategies within the supply chain, particularly at point-of-sale and by producers. Thus, free-range production, for example, is used as a point of differentiation by both producers and retailers. It is of interest to understand the impact of this awareness and these discussions on the sale of farm animal products and on social license to farm.

Public concerns about livestock animal welfare are well documented worldwide (e.g. European Commission, 2007; Gracia, 2013) and there has been an ongoing interest in these concerns in Australia (e.g. Coleman, 2018, Coleman et al., 2015, 2018; Parbery & Wilkinson, 2012). Concerns about livestock animal welfare are not the major drivers of consumer purchasing decisions because attitudes to livestock welfare is only one of the predictors of purchasing

behaviour with price, healthiness and local production being more important for consumers (Coleman et al. 2005; Coleman & Toukhsati 2006). However, there are trends for sales of “welfare-friendly” animal products (free-range eggs, for example; Australian eggs, 2017) to increase. While such changes in consumer demand require farmers to transition to practices and facilities that are acceptable to the public, such transitions have generally been managed in an orderly way and farmers have been able to accommodate the changes without major compromise to the viability of production.

This trend for farming practices to change as a consequence of consumer demand is part of a more general trend for public attitudes to impact the livestock industries more directly through public demands for change because of concerns about farm animal welfare (Coleman et al., 2015, 2017a; Martin & Shephard, 2011). While public attitudes only account for a modest amount of the variation in purchasing of animal products, they do account for a substantial proportion of the variation in behaviours that the public engage in which, in turn, have the potential to threaten license to farm. These community behaviours are those that “do not require public expression or public identification” and “involve taking advantage



of situational opportunities to express an attitude through action” (Coleman and Toukhsati, 2006, p.21). They include such things as signing petitions, donating money to animal welfare organisations, and speaking to colleagues about animal welfare issues. Coleman (2018), discusses social license to farm which is defined by Martin and Shephard as “...the latitude that society allows to its citizens to exploit resources for their private purposes” (2011, p.4). Coleman points out that social license is granted when industries behave in a manner that is consistent, not just with their legal obligations but also with community expectations (Gunningham et al., 2004; Williams et al., 2007). The threats to farming that arise from failure to fulfil the obligations inherent to social license can lead to increased litigation, increased regulations, and increasing consumer demands all of which hamper the success of industries.

There has been a trend for community behaviours that can impact on the livestock industries to become more prevalent over time. Table 1 shows the changes in the frequencies with which

respondents reported being engaged in community behaviours in opposition to the livestock industries between 2005 (Study 1; Coleman 2017a) , 2014 (Study 2; Coleman, 2017a) and 2018 (Study 3, 2018, unpublished data). Most respondents engaged in at least one community behaviour.

These behavioural trends indicate that not only is there a tendency for public sentiment to become increasingly concerned about farm animal welfare, but that this sentiment is reflected in the actions that people take. What is unclear, however, is the impact that these behaviours have on the viability of farm animal production in the medium to long term. There are two interesting features of the trends in community behaviour. The first is, as table 1 shows, that some activities, including signing petitions, donating money to welfare organisations and discussing welfare issues with family and friends, continue to increase. This suggests that community awareness of welfare issues is increasing. Second, some research has shown that there is a subset of the community

who identify themselves as opinion leaders on farm animal welfare issues. These people report that they tended to be used as a source of animal welfare-related information by friends and neighbours, tended to be asked about livestock animal welfare and tended to tell people about livestock welfare. Further, these people hold more negative views of the livestock industries, hold more negative beliefs about livestock animal welfare and report a higher self-perceived knowledge of livestock practices, but have no better actual knowledge than do the remainder of the population. Further, these people tend to engage in more activities in opposition to the livestock industries (Coleman, 2017b). As yet, there is no research on what, if any, role such people might play in forming or reinforcing community opinions about the livestock industries.

It is difficult to forecast how trends in public concern about farm animal welfare in Australia will impact on license to farm. Adverse events, for example filming of badly compromised sheep welfare and mortality during live animal sea transport from Australia to the Middle East,

frequently drive expressions of public concern that subside fairly quickly. However, it is likely that these events progressively erode public trust in the livestock industries. Campaigns by animal rights groups also have similar effects, for example campaigns against live cattle exports, or against intensive housing in pigs or poultry. While there are instances of attempts by the livestock industries to improve animal welfare through new codes of practice and changes to housing and husbandry, there is a clear need for the livestock industries to proactively identify and address welfare risks and to better engage the community in justifying practices on the one hand and responding to public concerns on the other. This will necessarily involve a greater emphasis on engagement and transparency and less on a public relations approach. It will also entail a transition from defensiveness by the livestock industries to engagement and a willingness to treat public discourses as a communication exercise rather than simply dismissing public concerns as reflections of a lack of community knowledge or understanding.

Table 1. Percentages of community behaviours in opposition to the livestock industries.

	Written to a politician	Called radio talk back	Attended a public rally	Signed a petition	Donated money to animal welfare organisation	Volunteered services to animal welfare organisation	Spoken to colleagues, family or friends	Written to a newspaper	Posted on social media
Study 1	4.5%	1.6%	3.1%	25.6%	35.6%	3.0%	30.1%	2.2%	N/A
Study 2	9.4%	2.3%	7.5%	36.3%	46.6%	11.7%	55.3%	4.0%	N/A
Study 3	6.4%	0.8%	7.4%	40.2%	47.6%	11.8%	66.5%	1.8%	34.1%

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Dr. John Campbell graduated from the Ontario Veterinary College, University of Guelph in 1985. After several years of rural veterinary practice, he returned to Guelph to complete a Doctor of Veterinary Science degree in Ruminant Health Management. He has worked as a clinical faculty member on the Ruminant Field Service Practice at the Western College of Veterinary Medicine, University of Saskatchewan since 1991. He served as Dept. Head of the Dept. of Large Animal Clinical Sciences from 2011-2017. His primary research interests are in the fields of beef cattle production medicine and disease surveillance in beef cattle. He also acts as the director for the college's Disease Investigation Unit. Dr. Campbell has over 80 scientific publications in scientific journals along with numerous conference proceedings. He has been the recipient of 5 teaching awards at the Western College of Veterinary Medicine and is the past recipient of the Western Canadian Association of Bovine Practitioners Veterinarian of the Year Award and the Carl Block Award for contributions to Canada's animal health programs.

Professor John Campbell
University of Saskatchewan, Canada

Do the benefits of pain management extend beyond the animal?

The National Farm Animal Care Council (NFACC) coordinates the development of guidelines for the care and handling of the majority of species of farm animals in Canada (1). These guidelines are intended to promote good management and welfare practices through recommendations and requirements in the areas of housing, management, transportation and other animal husbandry practices (1). The Codes also form the basis of animal care assessment programs and within some provinces, the Codes of Practice are referred to in animal welfare legislation.

The Canadian Code of Practice for the care and handling of beef cattle (COPB) was revised in 2013 (2). The process for the development of these revised guidelines begins with a request from a national commodity group to update or amend the Code of Practice. In this case, the Canadian Cattlemen's Association was responsible for organizing a Code Committee which had broad participation with representatives from producer groups, transporters, veterinarians, national animal welfare association, provincial animal protection enforcement authorities, retail and food service

organizations, processors, Agriculture Canada, the Canadian Food Inspection Agency, researchers and academics and provincial government animal welfare representatives (2).

Some of the key guiding principles of the development process include that the Code must be based on science and reflect the wide variation in production practices across Canada. As a first step of revising the Codes, a scientific committee of approximately 6 or more scientists are tasked with developing a priority list of welfare issues for that sector and then generate a scientific report on those specific welfare issues (1). The priority welfare issues identified as part of that process included Feedlot health and morbidity, weaning methods, environmental and housing conditions and painful procedures (3).

The Code committee is then responsible for drafting the Code utilizing the scientific report and if necessary requesting more information from the scientific committee. This is a consensus based process and there is a significant amount of public consultation and feedback once the guidelines have been drafted.

Do the benefits of pain management extend beyond the animal?

One of the most difficult topics for the Beef Code Committee to reach consensus on was in the specific area of “painful procedures” (2). This was partially due to changing societal views, a paucity of research available in beef cattle at the time, and a lack of familiarity with licensed pharmaceuticals with pain control claims within the cow-calf and feedlot sectors. To further complicate the issue, the dairy code of practice had already been revised and had included recommendations and requirements for pain control for procedures such as dehorning and castration (4).

Ultimately, consensus was reached and after public consultation and feedback, the COPB contained specific recommendations and requirements for painful procedures such as castration which included recommendations for pain control along with requirements for pain control that would be phased in gradually over time).

Canadian Beef Code of Practice Castration Requirements (2)

Requirements

Castration must be performed by competent personnel using proper, clean, well-maintained instruments and accepted techniques.

Seek guidance from your veterinarian on the optimum method and timing of castration, as well as the availability and advisability of pain control for castrating beef cattle.

Castrate calves as young as practically possible.

Effective January 1, 2016:

Use pain control, in consultation with your veterinarian, when castrating bulls older than nine months of age.

Effective January 1, 2018:

Use pain control, in consultation with your veterinarian, when castrating bulls older than six months of age.

However, despite the publication of an updated COPB, the implementation of these requirements and recommendations is largely voluntary. Moggy et al recently surveyed western Canadian cow-calf producers to assess their familiarity with the COPB and to explore producer attitudes

towards it (5). Slightly more than half of the respondents to this survey had not read the COPB (53%) although only 4% of respondents who were familiar with the COPB disagreed with many of the recommendations within the COPB (5). Qualitative interviews were also performed and in general producers had a positive view of the COPB and viewed it as a benefit to the industry. However, producers stated they were not willing to change their practices just because the COPB required it, but would prefer to see value to their cattle and operation. For example producers who utilized pain control for castration indicated that they utilized these methods because “they viewed them as common sense”.

Moggy et al also surveyed Western Canadian cow-calf producers specifically about painful procedures and the use of pain control products. The adoption of the use of non-steroidal anti-inflammatories (NSAIDs) for pain control was still quite low at the time of this survey. Only 4% of producers were utilizing NSAIDs when castrating young calves <3 months of age and approximately 18-20% were utilizing NSAIDs when castrating calves at >3 months of age (6). Surprisingly the adoption of the use of NSAIDs was relatively higher when producers were dealing with cows with dystocia or C-sections.

There have been a number of clinical trials evaluating the impact of pain control with the use of NSAIDs such as meloxicam at the time of castration. These trials can be difficult to evaluate in combination as they utilize different age groups of bulls, various castration techniques and in some cases different methods of analgesia. Many of those trials have shown reductions in behavioural indicators of pain, inflammatory responses and improvement in levels of hair or serum cortisol when utilizing NSAIDs such as meloxicam at the time of castration (7, 8, 9, 10, 11). While many of these studies have attempted to demonstrate a performance benefit, most have failed to demonstrate improvements in outcomes such as average daily gain especially when evaluating the use of NSAID use with castration in calves <3 months of age. A number of trials that have castrated calves at weaning or post weaning have been able to demonstrate a significant performance benefit associated with the use of meloxicam in terms of average daily gain or in terms of pull rates for respiratory disease (12, 13, 14).

Anecdotally, the experience in Canada has been that producers who adopt the use of NSAIDs such as meloxicam at the time of castration tend to continue to use the product and believe it is highly beneficial. Performance benefits in young calves do not seem to be the primary reason for adoption and continued use. The primary benefit that many of our extensive cow-calf ranch managers claim is that after processing, cow-calf pairs are reunited more quickly and the cow-calf pairs move to the next pasture much more quickly and with less stragglers. Livestock managers are often astute observers of animal behavior and they can also identify that calves given NSAIDs at the time of castration exhibit fewer of the behaviors associated with pain.

The adoption of pain control practices within the Canadian beef industry continues to grow and will be an ongoing process. Changing the practices of beef producers will take time and will require more research and extension efforts. Additional efforts through producer managed, voluntary, market oriented programs in Canada such as Verified Beef Production Plus (VBP+) will also motivate producers to adopt new practices such as pain control. VBP+ is aligned with the COPB and animal welfare is an important assessment component of farms that are enrolled in the VBP+ program (15). These programs can help ranches and feedlots to provide proof of their sustainable beef production practices and will help position registered farms as a source of sustainable beef with strong welfare standards.

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Mr Norton is the fifth generation of a beef and sheep farming family from Monaro, NSW. He began his working life as a rouseabout and jackaroo then for more than 20 years served livestock producers as a stock agent and auctioneer across NSW. Mr Norton is Managing Director of Meat & Livestock Australia Ltd and is a director of Integrity Systems Company Limited, MLA Donor Company Limited, AUS-MEAT Limited and Red Meat Traceability Systems Pty Ltd.

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Mr Norton has held executive positions in retail, manufacturing, logistics and warehousing with Woolworths, Coca Cola, Wesfarmers and Toll Holdings and was a non-executive director of Agrium Asia Pacific, the Australian Wheat Board, RD1 New Zealand, Landmark Harcourts and Australian Wool Handlers. He was head of Live Export and International Trade and then Managing Director of Landmark Operations Australia. He was Chairman of Integrated Traceability Solutions (Global) and AuctionsPlus.

Richard Norton

Meat & Livestock Australia Ltd

For the love of meat



Introduction

Meat & Livestock Australia Limited (MLA) delivers research, development and marketing services to Australia's cattle, sheep and goat producers. MLA has approximately 50,000 livestock producer members who have stakeholder entitlements in the company.

The Australian red meat industry is strongly committed to animal welfare practices and how livestock are cared for. Together with the red meat industry, MLA has implemented a range of programs and initiatives to address animal welfare concerns.

Australian red meat producers are aware of their responsibilities for their animal's welfare. Australia has become an international leader in the development of industry welfare standards and guidelines. To further improve the well-being of Australian cattle, sheep and goats, MLA invests in research projects and provides tools and knowledge for Australian farmers.

State animal welfare acts and regulations

Each state has its own animal welfare Act and accompanying regulations.

The Act and regulations are for people who own or work with animals.

To ensure a consistently high level of animal welfare on a national basis, MLA in collaboration with the various state Government departments and red meat industry peak councils, is developing a comprehensive national animal welfare standard with guidelines for the red meat and livestock industry.

On-farm - Animal welfare standards and guidelines

To help cattle and sheep farmers implement animal welfare practices on their farms, the red meat industry and other stakeholders have established animal welfare standards and guidelines to provide information around the production and care of livestock. They define acceptable welfare practices for livestock husbandry and transport and replace the old codes of practice.

Feedlots - National Feedlot Accreditation Scheme

The Australian feedlot industry developed

the National Feedlot Accreditation Scheme (NFAS) in the early 1990's. The NFAS incorporates a strict animal welfare component, which ensures the cattle in the feedlot are well cared for and monitored on a daily basis. Feed, water and air quality, temperature and heat levels are constantly monitored. If an animal displays any signs of illness, it is treated by a veterinarian to ensure it is returned to optimal health as soon as possible.

Feedlots are independently audited to ensure compliance to the NFAS, and all its components. MLA works closely with the Australian feedlot sector to continue to improve animal welfare in feedlots, particularly with regards to heat load stress.

Transportation - quality assurance program

Livestock need to be transported between properties, feedlots, saleyards, meat processing facilities and for live export. To ensure the welfare of livestock on these journeys, and to maintain the quality of the red meat product, a national guide and quality assurance system has been developed. Red meat producers are provided with the national guide to assist them with the transportation of livestock.

The 'Is it fit to load?' publication was developed by MLA in consultation with the livestock industry to help cattle, sheep and goat farmers decide if an animal is 'fit and healthy' for transport. This helps ensure the safe arrival of animals at their next destination. The red meat and livestock industry husbandry and transport codes of practice recommend how livestock should be prepared for transport. These recommendations include rest periods, and the feed and water requirements. Additional material about land transport can be found at the Livestock Transport Standards website.

The TruckCare initiative has been developed to provide quality assurance around truck transportation in the livestock industry. The programs are independently audited and built on sound international standards.

Livestock exports

Australia is a world leader in animal welfare practices related to livestock exports. These practices extend from the farm

through to the port, on-ship and in export destinations. Any person involved in the export of livestock, from farm to vessel, must comply with the Australian Standards for Export of Livestock. Relevant industry Export Standards legislate how livestock should be prepared for transport, including rest periods and feed and water requirements.

MLA and LiveCorp joint initiatives, such as 'In the ute. Not the boot' have helped improve sheep transportation in the Middle East markets. MLA developed the publication, 'Is it fit to export?', which provides those in the livestock export industry with information on whether cattle, sheep and goats destined for export are suitable for the journey.





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Leisha is an animal welfare specialist, leading projects in both pure and applied animal welfare research. She acts in a consultancy and advisory capacity to a wide range of livestock industries, particularly to emerging and developing industries seeking to implement meaningful and effective standards of animal welfare. She is a member of the OIE ad hoc working group developing standards for the slaughter and killing of commercially farmed and wild-caught reptiles. She is a Lead Auditor and Animal Welfare Assessor with a total of 15 year's experience in the application of animal-based measures and on-farm assessment protocols across a range of species and production systems worldwide. Leisha is also a Director of Exotic Assurance, an organisation that works with stakeholders to develop and implement assurance and certification schemes based on sound scientific principles, and humane and sustainable production and processing systems.



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Developing welfare standards: beyond borders

Introduction

Animal welfare is a growing concern, especially in Europe (European Commission 2007). The demand of the 'consumer' for products that meet a high welfare standard, as interpreted by retailers, regulators and other organisations are presented in the media on an almost daily basis (Trienekens et al. 2012). This public pressure has led to the development and implementation of a range of animal welfare standards, guidelines and assurance schemes across all aspects of livestock production and trade (FAWC 2001, Sundrum 2001, Blaha 2002, Webster et al. 2004, Edge and Barnett 2008, Mench 2008, Veissier et al. 2008, Main 2009, Webster 2009, Rushen et al. 2011), and this trend is set to continue. In addition to 'public standards', the inclusion of animal welfare as a quality attribute, valued by consumers, has led to the proliferation of many 'private animal welfare standards', operating under different schemes and providing different levels of information to stakeholders.

Objectives of animal welfare standards

Fundamental to the development of an animal welfare standard is the very definition of 'animal welfare'. Many attempts have been

made to agree on a concept, however, there is such a large variety of views and perceptions which makes this very difficult. Welfare is multidimensional, comprising of health, comfort, nutrition and expression of behaviour (Mason and Mendl 1993). This understanding is well illustrated by the six general principles, for animal welfare in production, formulated by the World Organisation of Animal Health (OIE). The OIE, which has over 180 signatory countries, defines an animal as having good welfare if it is "healthy, comfortable, well nourished, safe, able to express innate behaviour... is not suffering from unpleasant states such as pain, fear and distress" (OIE 2017). The OIE has developed International standards, which are presented as a series of guidelines covering animal production, transport (land and sea), euthanasia and commercial slaughter. Many private animal welfare standards use the OIE standards as a basis for their animal welfare requirements; an approach recommended by OIE themselves. In addition, OIE also call for increased "transparency of private standards" (OIE, 2010), however, they do not provide a framework for this process. Different countries use different private schemes to provide assurance on animal welfare and there is little structure to allow effective comparison. In contrast, the organic sector is

well-developed in this area; providing an agreed international framework for the development of standards and associated conformity assessment processes that facilitate international trade.

Content and nature of animal welfare requirements

Animal welfare standards are comprised of a set of requirements that must be fulfilled. They generally aim to provide assurance on minimum welfare requirements or to result in a welfare improvement. In many early animal welfare assurance schemes the requirements were based on the Five Freedoms, which still remain widely referenced in many current schemes (Main et al. 2001), regulation and global standards (OIE 2017). The Five Freedoms define an ideal state of welfare that contain reference to both physical and mental well-being, however, they present some limitations. Some of the freedoms are very general, some have a degree of overlap and the provision of all the freedoms simultaneously can be difficult. Consequently, there has been a drive to introduce a more comprehensive method of determining an animal's welfare state and incorporate this into a set of requirements that make up the animal welfare standard.

Many animal welfare standards define a set of requirements related to resources that are considered important for the animal (Mench 2008), for example, feed, bedding and space allowance. Conformance with minimum resource requirements has been used in different animal welfare schemes, with some schemes including a tiered system of resource requirements, related to different levels of welfare outcome. A pitfall of the resource-based approach is that adequate provision of resources does not always result in an improved animal welfare outcome (Whay et al. 2003). More recent schemes have incorporated an outcome-based approach into welfare assurance schemes, in addition to prescribing basic resources. The application of outcome-based requirements within assurance schemes is supported by the publication of standardised assessment protocols by the WelfareQuality® Project. WelfareQuality® assessment protocols are based on both animal-based and resource-based measurements. The resource-based measurements are used mainly as a supplementary activity when there are no valid animal-based measurements available (Veissier, Jensen et al. 2011).

Fulfilment of animal welfare requirements

The welfare outcome of an animal welfare standard is dependent on the nature of the requirements and the consistency and rigour to which they are enforced. Verification that the requirements are being fulfilled is a crucial element of the assurance system. Credible verification processes need to be independent, impartial performed by competent assessors. It is important that assessors are both competent auditors and knowledgeable in the production processes that are being assessed. There are a wide range of conformity assessment techniques that can be used to demonstrate fulfilment of specified requirements. Animal welfare assurance schemes usually incorporate a process of on-site auditing, supported by additional document review and monitoring. This usually in the form of an initial visit to a facility, followed by regular (usually 6-18 months) surveillance audits. The auditing process involves an assessment of conformity against the standard and usually the use of 'nonconformities' to indicate where the facility cannot sufficiently demonstrate that they fulfil the necessary requirements. When nonconformities are used in schemes they are normally communicated to the facility that is subject to assessment and a prescribed period is given for the facility to investigate and undertake corrective action. The corrective action is then reviewed by the assessor and if found to be acceptable the nonconformity is closed.

Summary

To deliver good welfare, animal welfare standards need to include resource, outcome and continuous improvement aspects; in a coordinated approach that follows international best-practice guidelines in their development, implementation and verification. Techniques used to assess animal welfare are constantly being developed and improved. Embedding scientifically supported animal welfare outcome assessment into the standards is an essential component of a credible scheme.

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Sue Hardman is the founder and managing director of Hardman Communications, an award winning agency focused on strategic communications for clients in the agribusiness and industrial/manufacturing sectors. Sue established Hardman Communications in 2002. The agency represents brands right across the supply chain of agriculture from financial services to crop protection, animal health, recruitment, associations and technology and machinery. Her agency also has its own suite of social media packages and its own radio show, Regional Voices.

Prior to starting the agency Sue worked for over 10 years in internal, corporate and marketing communications and brand management for a range of multinational brands with responsibilities spanning Australia, South East Asia, Europe and North America.

Sue has an Executive MBA from the University of Wisconsin, USA, a Post Graduate Diploma in Marketing Management from the Macquarie Graduate School of Management, Sydney and a Bachelor of Arts (Major in applied Communication studies) from Western Sydney University. She is a communications subject matter expert on the Horticulture Innovation Australia tender review committee.

Sue is a member of the Public Relations Institute of Australia, the PRIA's Registered Consultancies Group, the Agribusiness Association of Australia, the Australian Farm Institute and the Tractor and Machinery Association (TMA).

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The web of influence



Improving wellbeing outcomes for animals relies on practice change. And practice change relies on attitude change, not just on farm or at the clinic, but right across the supply chain, from producer to consumer.

To keep shifting the dial on animal wellbeing, people have to want to do things differently, though the motivation may differ from one audience to the next. Data, insight, regulation and commercial drivers all have their part to play in encouraging people to desire change, but ultimately people are swayed by those they trust.

Social media is no silver bullet, it can only ever be part of a broader approach. Nonetheless, it has an important role to play in reaching and earning the trust of those who produce, process, export, sell, and consume animal products (and even those who don't consume these products – including the important activist audience), plus all those industries that support them. The social media web of influence is complex and far reaching.

Social media's omnipresence, and the unique characteristics of it that can impact behaviour, mean it offers great opportunity to support attitude change...and some dangers.

A word on social media and activism

To date, industry, with some exceptions, has not been highly successful in harnessing the potential of social media to win hearts and change minds. Certainly, the activist sector has, overall, been more successful in this space, although it's also true that to a large degree they are making waves in their own ponds and have been less successful at reaching into the mainstream.

Still, it's important to recognise how easily detractors can win influence, and why.

See Figure 1

There are five key elements of social media that set it apart from other channels, and each has its pros and cons.

- 1. Reach and breadth.** There is virtually no limit to the variety of content to be found on or via social media. On the plus side, this provides the opportunity for exposure to new ideas, different opinions and challenging beliefs. On the minus side, the era of Fake News has made it difficult to identify trustworthy sources and, perhaps more alarmingly, research

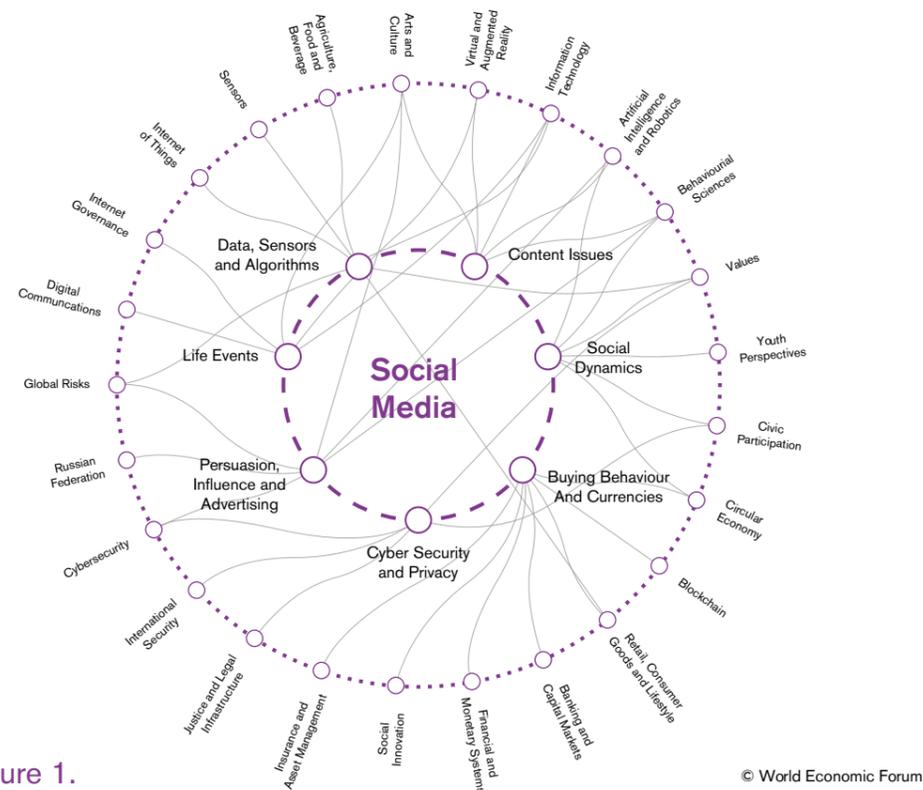


Figure 1.

has shown that many social media users would rather seek out content that reinforces their existing position than that which might require a more critical assessment of their views. This is a barrier to attitudinal change, but not an insurmountable one.

2. **Flexibility and simplicity.** Content posted can be text, images, audio, video (including live video). On the upside, this means content can be quick and easy to consume. On the downside, conveying complex ideas to audiences with short attention spans is not easy.
3. **Connectability.** Social media provides the opportunity for a two-way engagement, with users on both sides of the conversation able to access tools that enable real time responsiveness.
4. **'Bottom up' agenda setting.** Social media offers all users a voice and the chance to educate and influence without having to get deep in an issue. This is good news in terms of the ability to get a grass roots view but presents challenges around trust and credibility.

5. **Influence and referral power.** Social media is a conduit straight to the most powerful influencers and key opinion leaders but measuring their value can be tricky as the person with the most followers is not always the one who commands the most trust.

All these elements have something to offer for those trying to influence views, build understanding and change practice around animal wellbeing.

For it to be useful in the context of improving animal wellbeing, and more broadly in helping drive trade and other opportunities, an understanding of the social media landscape is also critical. It's not just about changing attitudes, it's about changing attitudes of the right people.

Remember, too, that social media is measurable and trackable in ways that few other channels are. This means each wellbeing message can be analysed for impact: who saw it, and what did they do in response? It's also highly targetable, so if changing attitudes relies on influencing and educating livestock vets or farm managers, product resellers or customers, producers or end users, it is more easily done here than in many other spaces.

Who is using social media?

The power of social media is born of the ability to connect and share information and ideas. Social media is an ever-growing beast – or is it? In the wake of the Facebook privacy scandal, and in the shadow of such Brave New World ideas as attention engineering, we're seeing a social media backlash and calls for a mass switch-off.

Even so, social media is pervasive and far reaching, and there's an argument to be made that those inclined to switch off were never going to be influencers or advocates in the first place.

A look at the social media landscape

Australians are some of the most active social media users in the world. Social Media Statistics Australia – April 2018

Facebook – 15,000,000 Monthly Active Australian Users

YouTube – 15,000,000 Unique Australian Visitors per month

Instagram – 9,000,000 Monthly Active Australian Users

WhatsApp – 5,000,000 Active Australian Users

LinkedIn – 4,400,000 Monthly Active Australian Users

Snapchat – 4,000,000 DAILY Active Australian Users

Twitter – 3,000,000 Monthly Active Australian Users

WeChat - 2,900,000 Monthly Active Australian Users

Global comparisons - The number of social media users worldwide is about 2.34 billion and that number is expected to grow to 2.95 billion by 2020 – but there are around 400 million people from across the world who have become inactive on social media.

Building trust through influencers

Social media originated as a tool for people to interact with friends and family (ie, to socialise)

but has long since become an important business tool for brands, including not just commercial brands but broader concepts like Brand Agriculture, wanting to reach out to customers, clients and other stakeholders. In any case, trust remains a key ingredient in a successful social media relationship, as in any other relationship.

Influencer marketing is based entirely around the idea of trust. Brands develop their own influencers, and they also work with people who already enjoy a positive profile. In agriculture and agribusiness these influencers range from social media savvy producers to credible and well-known academics to business advisers, suppliers and customers.

Many brands which have invested in influencer marketing have seen a positive impact on revenue. Changes in buying behaviour are essentially changes in attitude, so this approach can and does also work in shifting attitude and, consequently, practice. Across the agribusiness spectrum, social media is playing a role in shaping attitudes.

Building trust through content

Audiences connect with experience, emotion and storytelling. Facts, data, research are all important, but they sit behind the story, not in front of it. After surveying 6000 US consumers over three years, the United States Center for Food Integrity found shared values are three to five times more important than demonstrated technical ability or science in building trust. Think again about activist campaigns. People are moved by images of animals, by stories that individualise them, not by facts and figures. The wellbeing message is ideally suited to this type of storytelling content.

People must be able to relate. In discussing wellbeing and changing views, this means producers need to see stories about producers like them – producers with similar philosophies and goals, or in other words, similar values. The same goes for every other part of the supply chain.

The key to building trust is in building authentic connections. A new report on communication, education and engagement in agriculture notes that some of the key elements of successful and trust-generating content include finding common ground, building credible spokespeople and refining the art of storytelling.

Practical application

Social media is a heavy lifter, but it cannot do all the work on its own. Traditional advocacy and education approaches are as important as ever in shaping views on animal welfare and wellbeing. What social media offers is a complementary element that can reach bigger audiences and provide instant, measurable feedback on messaging and content – lessons which can be carried beyond social media's bounds.

The first step to doing social media well is to start doing it. The four things to bear in mind are:

- Reasonable expectations. Social is just one channel and it can't do everything.
- Deal in the middle of the bell curve. Don't waste time on the apathetic or risk on the extremists.
- Play to your strengths. Use strong stories, good images, credible spokespeople, and leverage the influencers in your circle.
- Watch, listen and participate. Social media is a conversation, not a presentation.

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In 2017 he was awarded Fellowship of the Australian Veterinary Association for service to the profession. In his spare time, he is in the final stages of completing a PhD on the topic “Ensuring dairy cow welfare with increasing scale of production” and is President of Mpower (a non-government, not-for-profit organisation that provides disability related services in south-west Victoria).

Dr David Beggs
University of Melbourne, Australia

Do cows think grass tastes good?



In contrast to the intensive nature of dairy production in many parts of the world, where cows may be housed in sheds or feedlots for large parts of their lives, most Australian dairy cattle spend at least part of the day grazing or foraging on pasture.

When pictures of pretty scenes with cows eating grass are shown to consumers, they associate this with good animal welfare. However, beautiful scenery can be misleading, and there are animal welfare challenges associated with pasture-based farming, especially as herds increase in size.

The Australian dairy industry is coming under increasing scrutiny from animal welfare advocacy groups. There is community concern arising from perceived intensification of the industry with an increasing number of large herds, and a need to be able to demonstrate and document animal welfare outcomes on dairy farms.

Humans will often make sacrifices to achieve outcomes that make them feel good. Whilst it may seem obvious to anyone who has watched a cow graze that cows do indeed like the taste of grass, it is important that we also look at the animal welfare “sacrifices” they make in order to do so.

Particularly as herds get bigger, long walking tracks, long milking times, higher levels of concentrate feeding and lower staff to stock ratios all have the potential to impact on dairy cow welfare.

Welfare quality assurance schemes

Various systems have been proposed to measure and audit welfare in dairy cattle.

One of the largest formal quantitative welfare quality auditing protocols that has been used in dairy cattle is the WelfareQuality® (Welfare





Quality, 2009). In this protocol, trained auditors objectively assess a wide range of elements across four categories as shown in Figure 1. There are limitations when applied to the Australian situation as it was primarily developed for use on dairy farms where cattle are housed and fed total mixed rations. It does, however, provide a useful framework and some objective measurements that could be used for on-farm measurement and benchmarking.

Housed vs pasture-based challenges

Whilst some of the animal welfare challenges are common to all forms of dairying (e.g. mastitis and lameness), others differ when comparing housed with pasture-based cattle. In the presentation we will explore these differences in more detail.

- 1. Absence of prolonged hunger** - In most modern dairying systems, prolonged hunger due to simple feed inadequacy is an uncommon issue, because it manifests as reduced production or increased disease and there is an economic imperative to avoid it. Thus, whilst monitoring the condition score of cows to identify very thin ones might seem an obvious metric, it is just as important to have a formal plan for managing risks such as drought, fire, flood, electricity failure and other events that might predispose to feed being unavailable. In particular, the risks of fire and flood can very quickly become animal welfare emergencies in pasture-based systems.
- 2. Absence of prolonged thirst** - In housed systems, resource-based measures such as the number of water points, their cleanliness,

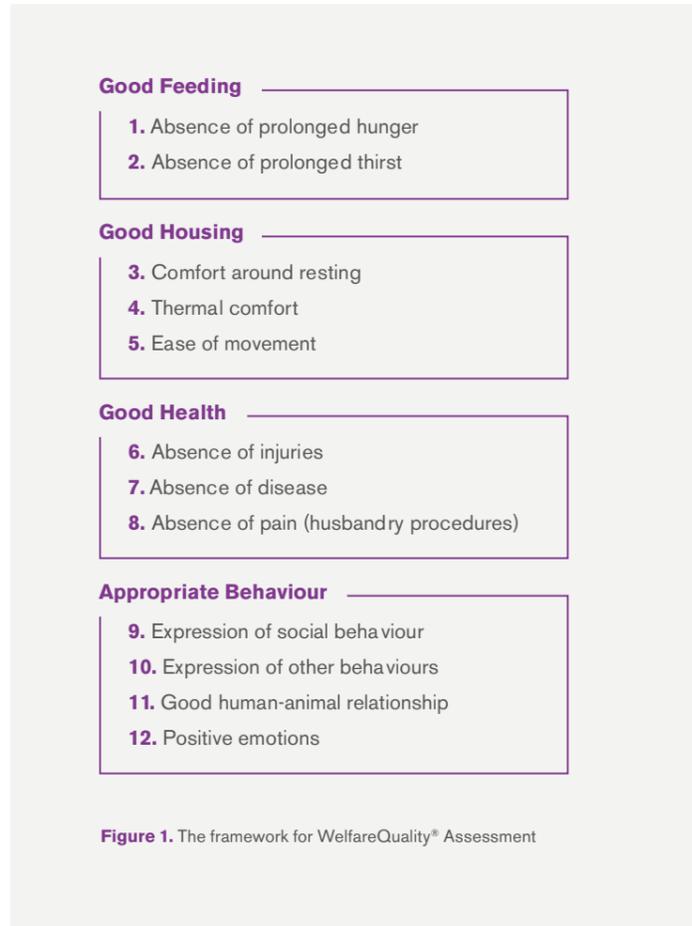


Figure 1. The framework for WelfareQuality® Assessment

and the frequency and duration of cow's access to them are important. In the Australian context, the size and placement of water points in paddocks, near the dairy and on dairy tracks may be important, especially with increasing herd size.

- 3. Comfort around resting** - Injuries and swellings of legs, knees and hocks are associated with lying on hard

or rough surfaces are less common in Australian pasture-based cows. However, ensuring cows have sufficient time for resting is a potential issue.

- 4. Thermal comfort** – In hot weather, thermal stress is a major health and welfare issue on pasture. Whilst the climate cannot be controlled, the cooling strategies that are used by farmers on hot days (such as shade and sprinklers) are important welfare considerations. In wet weather, cows find wet muddy conditions aversive and the ability of a cow to find somewhere comfortable to lie down is important.
- 5. Ease of movement** - Ease of movement is more of a welfare challenge for housed cows than those at pasture for a majority of the day. Potential risks associated with environmental monotony, odours and continuous lighting are uncommon in pasture-based systems.
- 6. Absence of injuries** - Housed cows are particularly at risk of injury from rubbing against housing infrastructure, or the surface on which they lie down, and this is manifest through observing swollen joints, hairless areas and skin lesions. In pasture-based cows, injuries from dairy infrastructure are possible, but swollen joints and hairless areas are uncommon.
- 7. Absence of disease** - Prevention and treatment of disease is an important welfare consideration in any system. Whilst pasture-based cattle tend to be more physically fit, there can be challenges associated with the time taken to diagnose disease, the necessity to walk long distances when unwell, and access to prompt euthanasia where necessary.
- 8. Absence of pain** (husbandry procedures) - Australia is perhaps a little behind in the uptake of pain relief for aversive procedures such as dis-budding. However, in recent times this has been strongly encouraged or made mandatory by milk processors, rather than legislators.
- 9. Expression of social behavior** - In pasture-based systems, cows are more likely to be able to express normal behaviours than in housed systems although the implications of living in very large groups on social behaviour needs investigation.
- 10. Expression of other behaviours** - A particular challenge of pasture-based systems where farms are large and the milking process takes several hours might be that the ability of cows to lie down is compromised. This needs further evaluation.
- 11. Good human-animal relationship** - Good human-animal relationships are important in all types of dairying and vary with the staff more than the dairying system.
- 12. Positive emotions** - Describing positive emotions in a scientific sense can be difficult. The Australian dairy industry likes to promote the concepts that cows like eating grass and this makes them happy. Cows at pasture are likely to have more 'Agency' – the ability to engage in voluntary, self-generated and goal directed behaviours.

Veterinary Involvement

In recent times, there has been a move to require Australian farmers (both beef and dairy) to have a formal written animal welfare plan, which can be referred to by all staff on a particular farm.

Do cows think grass tastes good?

Veterinarians are well placed to assist dairy producers develop such as plan as they are in the position of having subject knowledge and familiarity with the individual farm, but they do not have auditing or regulatory responsibility from an on-farm quality assurance program point of view.

It is important to note that in this context, a plan is not an audited quality assurance program. Rather, a plan should document the risks that have been considered, the level to which these risks are controlled on the individual farm, and any plans to reduce the level of risk.

This is an important concept because producers do not pass or fail their plans, and there is no conflict of interest for the vet involved because they are not being asked to enforce or assess the components within the plan but rather to identify major risks and help devise plans to reduce them.

The Australian Cattle Veterinarians (a special interest group of the Australian Veterinary Association Ltd) have recently introduced a WELFARECHECK® program, designed to assist producers to create an animal welfare plan which would satisfy the requirements of their on-farm quality assurance audits.

WELFARECHECK® is a software tool that allows for a guided consultation between a producer and their veterinarian in order to produce a farm animal welfare plan that would ensure the farm satisfies their milk factory quality assurance plan animal welfare component requirements, and allows for continuous improvement over time. This will be briefly demonstrated.

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James M Whittaker
Coles Supermarket, Australia

James works as Head of Quality and Responsible Sourcing for Coles Supermarkets based in Melbourne Australia and has been with Coles for 6 years.

James's role is to lead Cole's strategy for product quality, safety, sustainability, animal welfare and nutrition. James has shaped Coles approach to food safety and supplier management and delivered some key programs for Coles. James has most recently focused on leading sustainability and animal welfare strategies including seafood sustainability and removal of over 2 billion single use plastic bags.

Prior to joining Coles, James worked in the United States for 6 years where he led product safety, quality and responsible sourcing for Tesco's US start-up business, Fresh and Easy Neighbourhood Markets. During this time James was involved in setting up three manufacturing facilities dedicated to supplying own brand products to the retail stores.

James also partnered with large US Processors and State Universities to develop a new approach to animal welfare management.

James started his career working in animal welfare and food safety for Europe's largest beef exporter during the BSE crisis. James is originally from the UK and has worked in leadership positions for food manufacturing, packaging and retail businesses. James holds a Master of Science Degree in Meat Science from Bristol University School of Veterinary Sciences and is married with 2 children.



James M Whittaker
Coles Supermarket, Australia

Animal welfare, sustainability and the customer

Coles, a national supermarket retailer, shares their journey with today's supermarket customer.

Coles is an Australian retailer with over 800 supermarkets nationwide, employing over 100,000 people and serving 16 million customers every week.

Coles takes its commitments to responsible sourcing and agriculture very seriously and leads the Australian retail industry with animal welfare and sustainability initiatives across all of the primary sectors under its Coles Brand private label.

Coles brand has led with initiatives such as the removal of added hormones in beef production since 2011, sow stall and artificial growth promotant-free pork since 2014, cage free eggs since 2013 and 100% of all seafood sold is responsibly sourced since 2015.

Coles has led with support initiatives for Australian agriculture and operates a \$50 million Nurture Fund for small Australian suppliers to apply for grants and loans to develop their businesses, as well as producer

clubs for meat and produce suppliers to meet and share industry challenges.

As a retailer, Coles aims to be customer centric and continually listens to the needs of its customers with over 30,000 customers giving feedback every week. Customers are becoming increasingly interested in animal welfare and sustainable agriculture and Coles continues to work with the Australian primary industry and suppliers to ensure products and supply chains are delivering against customer expectations.

James Whittaker leads Coles Product Safety, Quality and Responsible Sourcing Teams and has worked in Australia, the United States and Europe delivering agriculture and animal welfare programs. James will discuss Coles' approach to developing animal welfare and agriculture strategies and how they relate the Australian consumer. James also will cover recent research Coles has conducted into customer and team member perceptions and how Coles have developed a communicating platform to inform its customers of responsible sourcing and agricultural initiatives.



Dr. Sara Platto
Jiangnan University, China

Dr. Sara Platto joined the College of Life Sciences of Jiangnan University in 2017, as Assistant Professor of Animal Behavior and Welfare. Dr. Sara Platto is a veterinarian and applied ethologist, whose research interests include farm animal behavior, animal welfare assessment, livestock stakeholders attitude towards animal welfare, and practical solutions to address farm animal welfare issues in China. For eleven years she has been an animal behavior and welfare expert in China, where she worked and collaborated with different academic and professional institutions such as Chinese Academy of Sciences, Huazhong Agricultural University, Chongqing Centre of Disease Control, Beijing Small Animals Association. Dr. Sara Platto was the first to develop Animal Behavioral Medicine for general public in China in 2007, where she collaborated with major veterinary clinics and lectured veterinary students and professionals on the subject of pets behavioral problems. As a veterinarian, Dr. Platto has always had a special attention to the spread of rabies disease in China, and on the 1st of October 2017, she organized the first rabies vaccination campaign of China in collaboration with major Chinese rabies virus experts and BI company. In 2014, Dr. Sara Platto joined the State key laboratory of agricultural microbiology, Huazhong Agricultural University, where she set up the research field on animal welfare to deliver tailor-made solutions to transform the current livestock production system in China. Since 2017, Dr. Platto is working to set up the Asian Animal Welfare Platform, which aims to bring together a multi-disciplinary and complementary team of academic of Asian institutions leaders in the fields of animal health, animal welfare assessment, residue detection, and animal production to address the issues of animal welfare across the Asian continent.



Dr. Sara Platto
Jiangnan University, China

Current state of farm animal welfare in Asia

During the last sixty years, worldwide population growth, urbanization, and increase in disposable income has fueled the rise of demand for meat and dairy products, which caused major changes in farm animal systems worldwide (Fraser, 2008). While in the industrialized countries the meat production showed a steady increase, the rise in meat demand in developing countries generated a profound change in animal production defined as “Livestock revolution” (Brown, 2003; Delgado, 2003). This phenomenon has been most evident in East and Southeast Asia, where bovine meat, mutton and goat has swelled, while the production of poultry and pig meat increased more than ten-fold (Fao, 2005).

The developed countries increased the production by shifting to more industrialized confinement systems, which were more evident in the pig and poultry productions, with significant changes also in the dairy and beef sectors (Fraser et al, 2001). While these transformations were occurring, the industrialized countries also experienced cultural changes which involved increased attention to animal quality of life (Fraser, 2001, 2005). As a consequence, regulatory reforms were created to improve animal welfare

from production to slaughter stages (Stevenson, 2004). On the other hand, the modifications of agricultural systems occurred rather differently in the developing countries, ranging from large-scale, landless, urban and peri-urban confinement systems, to the increase in the number of traditional production methods pursued on a small scale by many producers (Devendra, 2007). For example, in China’s largest 18 cities over half of the meat and poultry demand is produced in the urban areas. In Katmandu (Nepal), 11% of the animal food needs are met, and in Singapore 80% of the poultry products stemmed from urban farmers (Devendra, 2007; Li, 2009). Even though more industrialized confinement systems are increasing every year in Asia, they represent only the 5% of the entire animal production of the region, while the “backbone” of the agricultural system is still represented by the small scale mixed-crop farms which account for 95% of the total meat output (Devendra, 2007).

These farms only selectively adopt modern farming techniques that include the use of commercial feed, drugs for disease control and growth promoters, and barren housing. These small operations are often perceived by the

government as a backward mode of production because of their limited growth potentials and epidemic control problems (Li, 2009).

Among the Asian countries, China is the world leading producer of pig meat and the second for poultry meat. The greater production capacity of this country was made possible by a wholesale adoption of Western modern farming techniques such as gestation/farrowing crates and battery cages, which were banned in Europe since 2013 because of their negative impacts on animal welfare. Global guidelines for animal welfare have been adopted by OIE since 2005, and they passed by 167 countries members (among them also East and Southeast Asian countries), some of which did not have national animal protection legislation of their own (Fraser, 2008). Unfortunately, the OIE guidelines are not binding within the member countries, in the sense that they do not have the force of national legislation, but they may exert some influence through international trade (Fraser, 2008). Furthermore, cultural differences in the treatment of animals in East and Southeast Asia make enforcing Western animal welfare standards very arduous. In addition, the lack of control systems and legislation make it even more difficult to ensure the proper implementation of guidelines in these countries (Nielsen and Zhao, 2012).

In the rapidly developing countries of East and Southeast Asia, animal welfare standards are likely to be lower on the list of immediate concerns of the farmers, for whom availability and quality of animal feed, production yield, and disease control may rank higher (Sinclair et al, 2012). In addition, the general public still does not fully understand the importance of animal welfare (Li, 2009). The main reason for this attitude does not just lie in cultural differences, but mainly because people lack knowledge about animal welfare (Yan et al, 2013). In fact, the major barrier to the implementation of animal welfare standards in the Asian countries are represented by limited or absent knowledge and understanding of the ways animal welfare standards can impact the quality of the farm products and on the productivity of livestock (Burton, 2018). There is also a discrepancy in the attitudes towards animal welfare by the different classes of stakeholders in Asia. For example, farmers place a lower importance on animal welfare during transport and slaughter compared to other stakeholders such as veterinarians and business owners.

In addition, company prescriptions do not influence the farmers' ability to improve animal welfare, which is, on the other hand, exerted by peer acceptance (Sinclair et al, 2012). On the opposite side, team leaders and business owners give high levels of consideration to the welfare of animals during transport and slaughter, which may be dictated by the understanding of the influence of good animal husbandry on buyers and consumers, and its compliance for income (Sinclair et al, 2012). Furthermore, some of the welfare problems encountered in animal productions in Asian countries arise from the mismatch between the genetics of the farmed animals and the environment provided to them. Imported Western breeds are raised under "modified western standards" which provide housing and feeding of a lower quality than generally found in Europe and US due to lack of resources. This usually results in these foreign breeds having a poorer performance than that obtained in their native countries. On the other hand, native breeds are often raised using nutrition standards developed in US or Europe, which are based on criteria developed for fast growing western breeds (Nielsen and Zhao, 2012).

Moreover, Asian farmers have long abused antibiotics as growth promoters, to prevent and control disease outbreaks, and getting the animals ready for slaughtering (Li, 2009). For this reason, drug residual levels in meat and dairy products often exceed the minimum level allowed by relevant state regulations. Multiple classes of antibiotic compounds such as fluoroquinolones, and tetracyclines have been simultaneously detected at high concentration in all of manure samples of swine, cattle and poultry (Zhou et al, 2012). The high levels of antibiotic compounds in the manure may act as a non-point source of antimicrobial residues in aquatic and terrestrial environment (Zhou et al., 2012). In 2011, Asian countries represented the 48% of the globally veterinary antimicrobial market (Otte et al, 2012), and regulations of AMU (Anti-Microbial Usage) in livestock and national responses to AMR is quite variable, ranging from prominent and advanced domestic policies (Japan and South Korea) to very scarce or no surveillance (South Asia, India).

Despite these challenges, animal welfare as an issue of concern appears to be steadily increasing in Asia, with governments starting to show willingness to devote time and resources to the improvement of animal welfare (McIvor, 2018). The leading Asian country in farm animal welfare,

Japan, released the Shinshu Comfort Livestock Farm Certification Standard in 2007, which included sustainable livestock farming and rearing standards that consider animal welfare. In addition, an animal welfare assessment method was designed in Japan, based on the previous Animal Need Index (ANI) (Bartussek, 1999) but improved according to the local and cultural needs. In China, a humane slaughter program was jointly initiated by the World Society for the Protection of Animals (WSPA) and Beijing-Chaoyang – Anhua Animal Product Safety Research Institute (APSRI) in 2007 (Zili and Kolesar, 2012). The aim of the program was to improve the animal welfare in slaughter plants in China through a three-pronged approach: 1) train core-plant mid-level managers to be humane slaughter trainers; 2) provide guidance on legislation and codes of practice; and 3) develop and implement pre-slaughter and slaughter curricula for undergraduate veterinarians (Zili and Kolesar, 2012).

In 2014, the China Association for Standardization released "Farm Animal welfare requirements for pigs and beef cattle" with the aim to promote the sustainable development of livestock husbandry industry in China (CAS, 2014). In the same time frame, Thailand adopted the Animal Anti-Cruelty and Welfare Act with regulations and guidelines that addressed some key welfare issues in poultry and livestock (Gal, 2014), which lead one of the Thai top national pig companies to commit to phase out both gestation stalls and

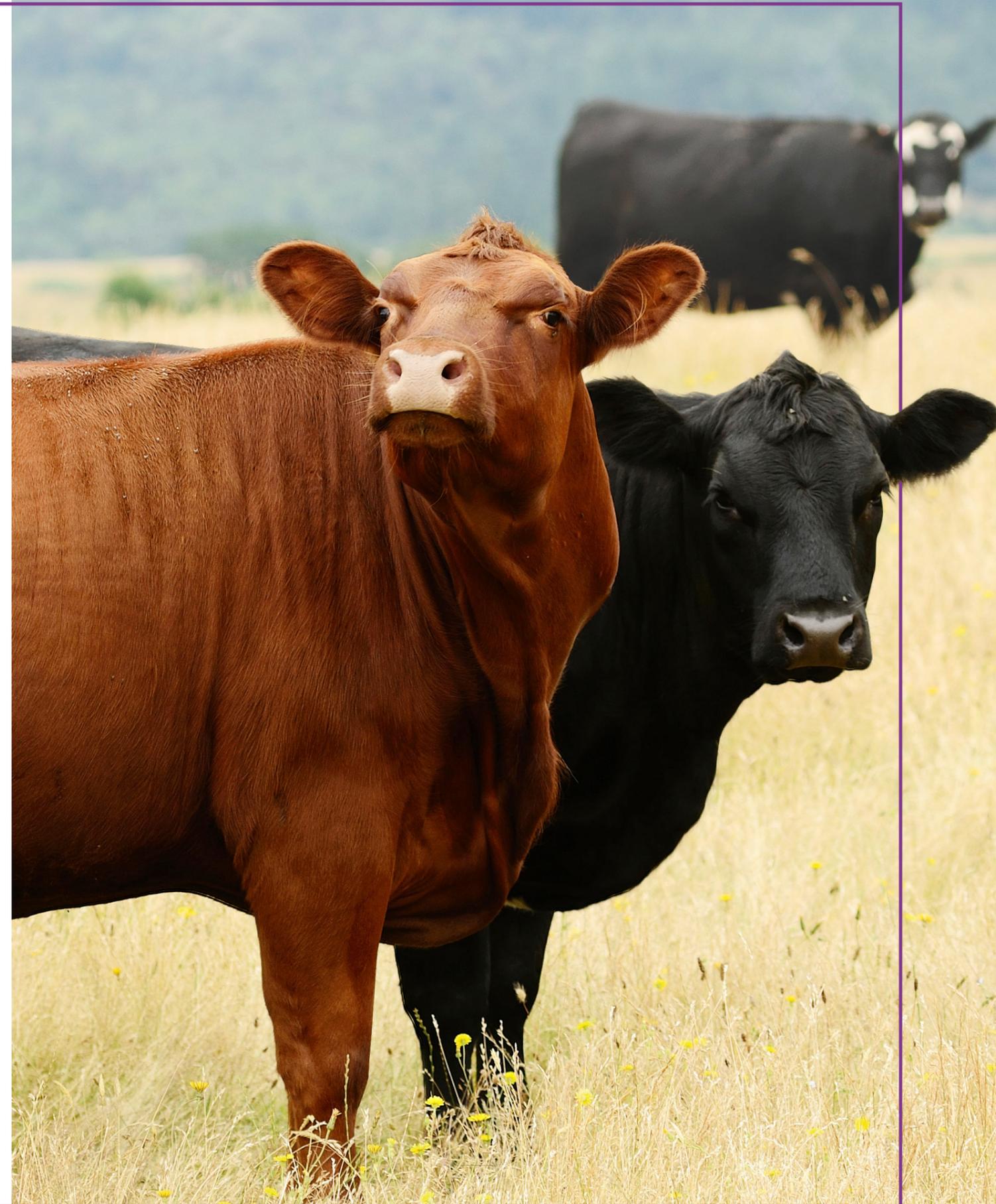
farrowing crates by 2027 (Gal, 2014). In 2012, the Council of Agriculture (COA) of Taiwan adopted the Animal Friendly Egg Production System Definitions and Guidelines. The plan aimed to encourage poultry farmers to adopt an animal-friendly production system through industry groups. Together with the participation of private certification institutions, the COA also encouraged consumers to purchase eggs produced by farms that developed the animal-friendly breeding which in turn will elevate the level of animal welfare. The international private sector may have also played an important role in the development of good animal standards by providing an incentive for complying with animal welfare standards by the Asian countries. Precisely, bilateral agreements between top Australian beef cattle producers and major meat producers in China and Thailand have made possible the initiation of state of the art slaughterhouses that meet Australian and European compliance standards (Phi, 2016; Nason, 2017).

Even though the regulations and husbandry standards adopted by Asian countries in the matter of animal welfare might seem scattered throughout the vast number of issues that still need to be addressed, local governments are slowly preparing themselves to enter the international meat market- not just as leading producers – but now as major exporters.



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Dr. Teresa Collins
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Teresa completed her veterinary science degree at the University of Sydney and is currently Senior Lecturer in Animal Welfare and Ethics at the College of Veterinary Medicine, Murdoch University, Perth. After 10 years in vet practice, a PhD and post-doctoral training involving animal models for human disease, her passion for animal welfare science was manifest. Teresa has co-developed national curricula in the teaching of animal welfare science, and is currently Chief Examiner in the Animal Welfare Chapter of ANZCVS. Teresa's research has focused on identifying objective measures of welfare, particularly for the livestock industry. Teresa has generated research incomes in excess of \$3 million, has been an invited speaker at international welfare science meetings, published over 30 papers, and served on several key industry steering committees and professional associations. Teresa is currently on the Australian Standards for Export of Livestock (ASEL) review committee.



Dr. Teresa Collins
Murdoch University, Perth, Australia

Welfare indicators: what to measure for live export **journeys?**

Animal Welfare Assessment

The Australian public currently seeks greater assurance about the management and welfare outcomes of exported livestock. This societal demand for sustainable and ethical animal production systems will continue, and therefore the industry must be proactive in their effort to ensure the welfare of the animals (Ferguson et al. 2014). Animal welfare is a key issue for the live export industry, in terms of community attitudes, economic returns and international socio-political relations. Current regulations for exported livestock are based on shipboard mortality and non-compliance with two sets of regulations; the Australian Standards for the Export of Livestock (ASEL) and Exporter Supply Chain Assurance System (ESCAS) (MLA 2015). These standards are comprehensive across the supply chain and are based on setting down physical requirements such as, minimum space. In recent years, scientists have made a shift in their emphasis in animal welfare assessment from the traditional approach of evaluating the environments and instead focused on animal-based welfare outcomes. Livestock moving through the live export supply chain present significant challenges to any welfare assurance program, as there are vast differences in the environments the animals

are exposed to. In addition, the opportunities for close inspection (access, facilities) will vary given they are transported to different geographical locations and jurisdictions.

Monitoring and quantifying cattle and sheep welfare across the entire live export chain is an important step towards quality assurance. Animal welfare measures can be classified into categories that assess the environment (resource-based measures), management strategies (management-based measures), and direct animal observations (animal-based measures). The use of resource-based measures (e.g. ventilation, provision of fodder) and management-based measures (e.g. stocking density, type of bedding) to assure adequate management of livestock during their journey are typically outlined in regulatory standards. However, care is needed for compliance approaches based on these tick-the-box assessment (using thresholds) since these are not necessarily associated with good welfare outcomes (Main, Webster and Green 2001). Thus, novel and improved measures of animal outcomes that reflect more directly the animal's experience are needed to promote transparency of livestock care and allow the comparison of welfare outcomes of management decisions that can promote continuous welfare improvement.



Although welfare assessment is something that proficient stock-people do as a matter of course when working with their livestock (Fleming et al. 2016), more formal evaluations that are documented and have a particular purpose may be required to develop a level of impartial review and maintain the livestock industries' social licence to farm and export livestock. This paper will address the question of which welfare measures should be taken, and how such a toolbox, or 'welfare dashboard' for live export might be applied.

The selection of accepted measures

For welfare assessments to be effective and acceptable to all key stakeholders (i.e. society, industry, and welfare scientists), they must incorporate measures that are scientifically and socially valid. Hence measures must be meaningful with respect to animal welfare, provide repeatable outcomes when applied by different observers and practical under farm (or commercial) conditions; that is they must be valid, reliable and feasible (Knierim and Winckler 2009). Most importantly they must be able to detect current welfare problems and identify any risk of future welfare compromise.

Incorporating pen-side welfare assessment into regulatory programs creates a new challenge in selecting criteria that must be widely accepted

as valid indicators by the local citizens. The rise of animal advocacy groups and the broad recognition of animals as sentient beings have led to the need for a better understanding of the various perceptions of animal welfare that exist among stakeholders. Understanding the perceptions of people from different countries or cultures will facilitate the development of welfare standards (Izmirlı and Phillips 2012), especially for an industry whose stakeholders span multiple cultures and belief systems. Therefore, before designing a dashboard of welfare indicators for livestock shipments, we surveyed a range of stakeholders, including the public and industry participants from multiple points of the export chain to determine their perceptions of animal welfare and to identify animal welfare measures that were perceived as both important and practical.

Results from an online survey of 921 participants (representing 74% public, 26% industry workers) will be presented. There were some differences in participants' opinions when asked who they would like to see collecting data on animal welfare in the industry, such as stockpersons or veterinarians who work for the industry versus independent animal welfare inspectors. Interestingly, most public and industry workers generally agreed on the importance of several physiological, health and environmental-based indicators as welfare

measures although more of the public thought that the measures described were important and practical compared with industry workers (21 tests; $p < 0.05$ for each). Both stakeholder groups rated factors such as injury/wounds, inability to stand, disease and ventilation as the most important of the 34 factors listed. This differed somewhat from a similar study (Pines et al. 2007). These factors identified as important to stakeholders were then considered together with those identified in the literature, for the development of the welfare 'dashboard' specific to the live export industry.

A dashboard of practical animal welfare measures

Scientific measures that reflect both physiological and behavioural aspects of an animal are valuable in providing a holistic picture of animal well-being. Welfare assurance schemes have been proposed to audit on-farm animal welfare, predominantly for intensively housed stock, such as pigs, poultry and dairy cattle and mostly in the EU (Phythian et al.). Frequently these have been based on four main principles first used in the Welfare Quality and AWIN projects (good feeding, housing, health and appropriate behaviour) (Blokhus et al. 2010). There has been little development of on-farm welfare schemes in Australia and given the extensive nature of our livestock industries, the schemes developed in Europe are not easily translatable. A Unified Field Index (UFI) for managing animal welfare

performance on-farm has been proposed (Colditz et al. 2014). This framework includes taking multiple measures on-farm and is potentially applicable to all livestock species. Furthermore, six animal-based welfare measures were recently identified as reliable and feasible for extensively measured sheep in Victoria (Munoz et al. 2018). These six measures include BCS, fleece condition, skin lesions, tail length, dag score and lameness which reflect both health and welfare indices. A review in 2015, considered 19 animal-based indicators valid for assessing sheep welfare and of these nine were considered feasible for use in UK abattoirs (Llonch et al. 2015). The indicators were: body cleanliness, carcass bruising, diarrhoea, skin lesions, skin irritation, castration, ear notching, tail docking, and 'obviously sick' animals. These studies indicate that both the animals' physical condition and behaviour were useful in establishing the welfare status.

Thus, a welfare dashboard that will collate multiple indicators reflecting the environment, management and the animal for each point in the supply chain is proposed. As behaviour is one of the most important early indicators of the individual's welfare, recording of objective measures of behaviour will be included and this may be especially relevant when monitoring livestock in hot conditions. Thus, including behavioural assessments at the pen level, such as respiration or panting score, and time budgets of animal activity such as frequency of resting, or eating will be informative to assess

the impact of environmental factors. Additional health parameters such as lameness or coughing would be scored. Given the varied ship board conditions, the sampling strategy chosen is paramount. Relationship between factors and welfare outcomes can subsequently be identified. Outcome-based measures will not to replace all resource measures, because the environment (e.g. wet bulb temperature, relative humidity) and resource provisions convey welfare importance too. Furthermore, there are challenges in assessing some behaviour-based parameters in a reliable, consistent, time efficient way. However, ideally the composite welfare dashboard should be able to detect current animal welfare problems and identify risk of future welfare compromise.

Therefore, a system that can capture relevant pen-side measures of welfare that are non-invasive, cost effective and that can be tailored to the logistics of the Australian live export industry will be described. Notably, the framework should enable stockpersons and managers to strive for continuous welfare improvement and identify non-compliance early enough to allow preventive or rapid remedial action.

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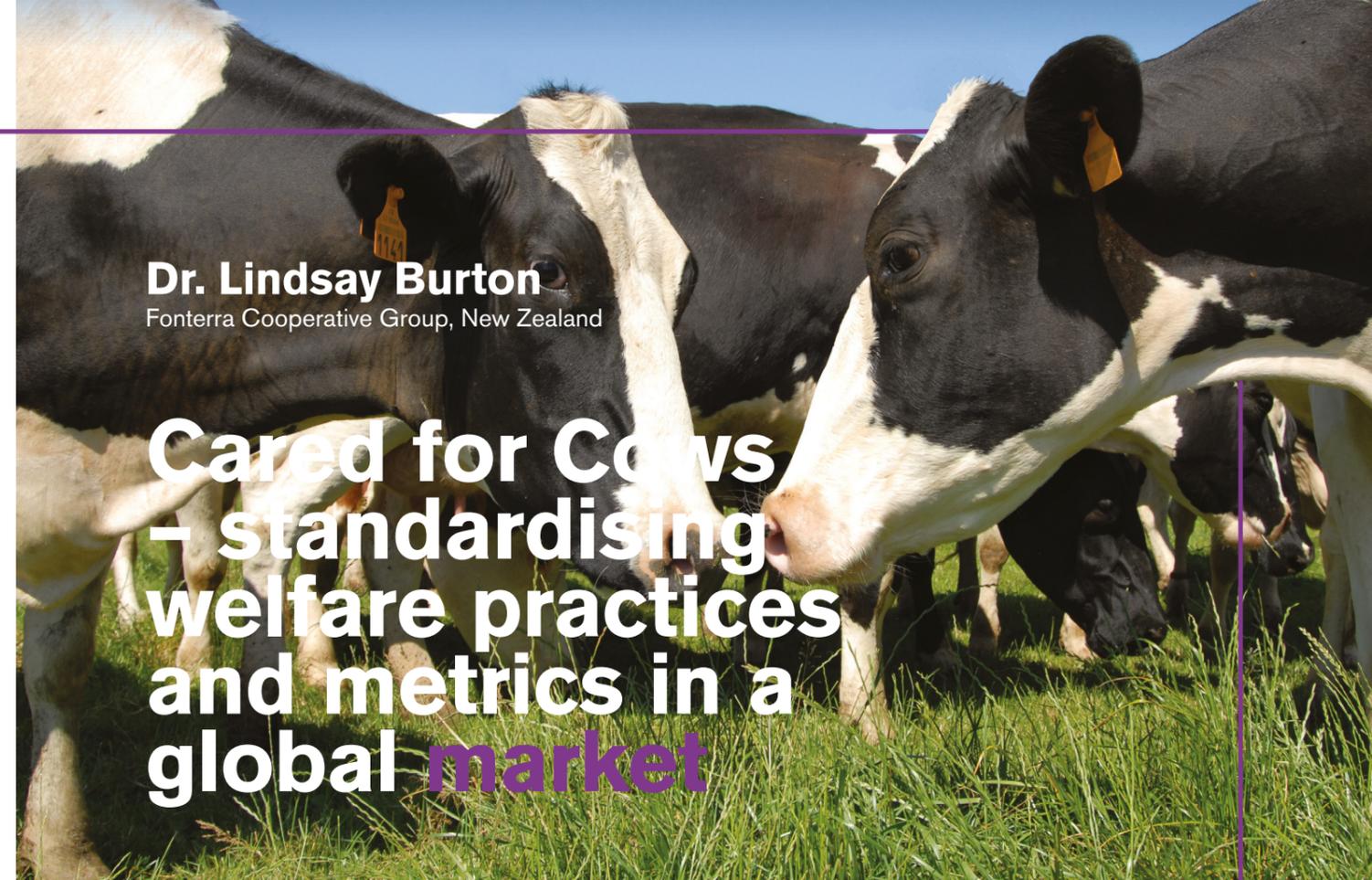


Dr. Lindsay Burton
Fonterra Cooperative Group, New Zealand

Dr Lindsay Burton is a veterinarian and General Manager, Veterinary, Technical, and Risk Management - Fonterra Cooperative Group, covering the areas of biosecurity, animal health including disease control, food safety arising from animal pathogens, residue risk assessment and animal welfare policy and strategy. This role and its functions is part of the wider Fonterra Food Safety, Quality and Regulatory Group.

Previous roles:

- Policy and technical advisor on national biosecurity, disease surveillance and incursion management issues and programmes to Dairy Company Association of New Zealand (DCANZ).
- Animal welfare strategy and issues management for the New Zealand dairy industry through DCANZ.
- International Dairy Federation (IDF) Standing Committees Animal Health and Welfare and Farm Management.



Dr. Lindsay Burton
Fonterra Cooperative Group, New Zealand

Cared for Cows – standardising welfare practices and metrics in a global market

Finding suitable metrics to describe the health and welfare status of dairy cows is an area receiving increasing focus by farmers, dairy manufacturers, retailers and consumers. Expectations relating to this may differ between stakeholders within country and also between countries. Internationally regulators are increasingly involved in the promulgation of rules that attempt to reflect expected welfare standards related to the animals used in food production.

There remains a significant challenge to produce suitable outcome based measures for animal welfare that allow demonstration of the status of animals often in highly varying production environments that range from fully housed intensive systems to very extensive pastoral systems. Many of the developed production animal welfare quality assurance programmes have focussed on input based measures. These may often be easily measurable and reported on but may have limited impact on the welfare status of the animals being managed.

This presentation will focus on high level outcome based metrics being considered for

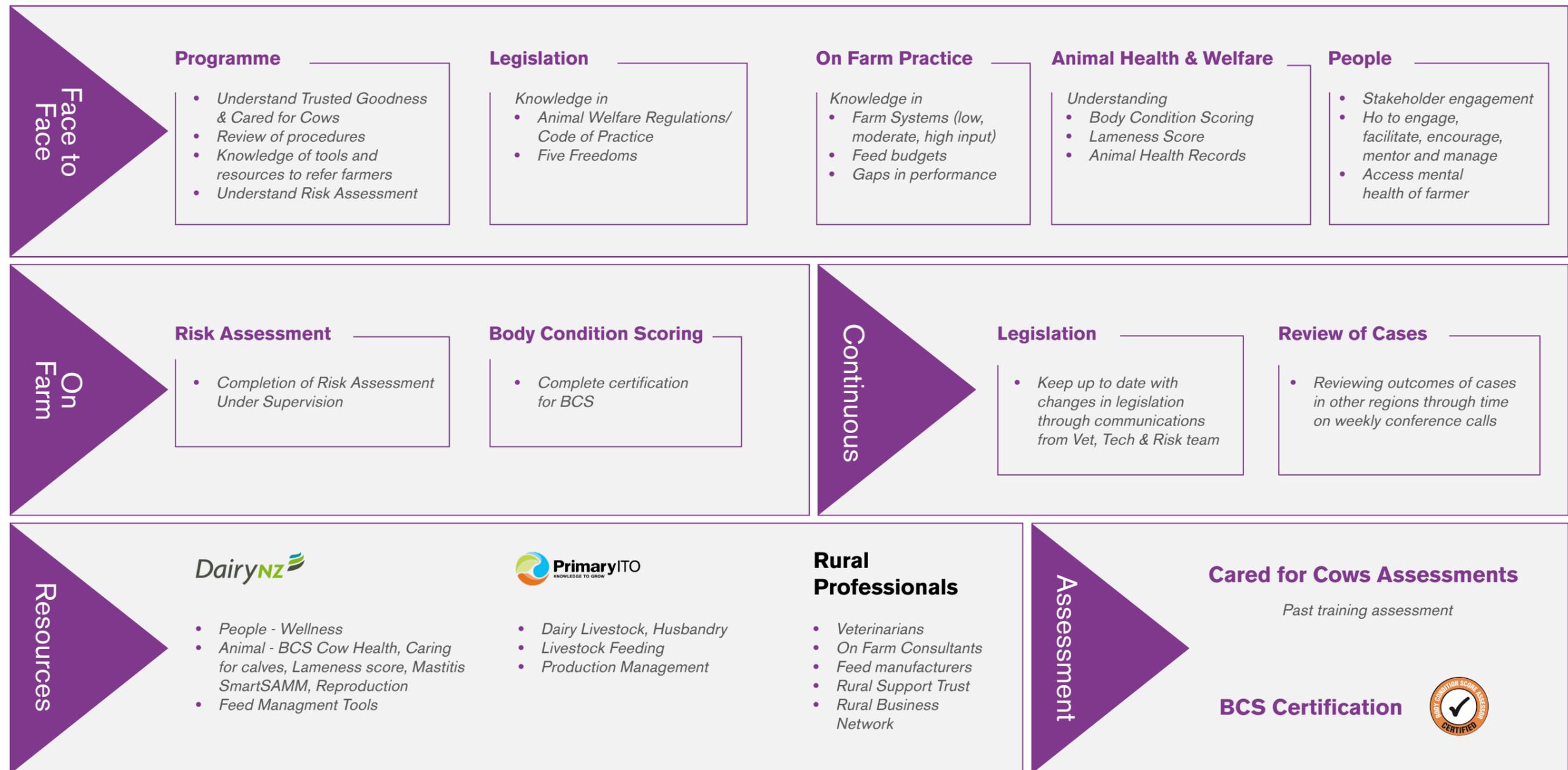
dairy production and examine how these may be used as part of an integrated assurance programme that allows initial performance assessment and risk identification of animal welfare. The information will be provided within the context other key factors and relevant influences. These areas are outlined in figure 1.

Fonterra: approaches to animal health and welfare.

At Fonterra, we believe:

Ensuring animal health and welfare, and the reduction of transmission of infectious diseases and pests to livestock and crops that impact animal, plant and human health, the community, economic livelihoods and the environment is vital, to:

Support our vision by helping our dairy communities thrive and supporting our commitment to responsible dairying by championing the health of our farms and waterways.



Cared for Cows - A Systems Approach

We are committed to:

- Manage animals responsibly:** Supporting our milk and dairy ingredient suppliers to meet globally recognised standards and eliminate practices that contravene the Five Freedoms.
- Adopting good management practice on farm:** Partnering with milk suppliers to support the adoption of good management practices to continuously improve animal health and welfare

outcomes, and to continuously improve biosecurity preventative measures.

- Advocating for robust industry and government standards, regulation and systems:** Collaborating with governments, international organisations, industry bodies and other key stakeholders to achieve animal welfare regulations, standards and measurements that are aligned to the OIE Terrestrial Animal Health Code; and to achieve robust

biosecurity regulation, standards and systems in an aligned way with industry.

- Being active in innovative solutions:** Initiating or participating in programmes to advance animal health and welfare practices and supporting technology.
- Preparing for incidence response:** Through our Group Preparedness and Response Policy and protocols, to ensure Fonterra and milk suppliers are prepared and

can manage pest and disease outbreaks.

- Ensuring compliance with codes of welfare:** Where they are published by the regulator in the country of operation.
- Fonterra advocates for high standards of animal welfare, both in New Zealand and overseas.



Dr. Holly Ludeman
Harmony Agriculture and Food Company,
Australia

Holly works as the Manager of Compliance and Welfare at Harmony Agriculture and Food Company. Holly studied a Bachelor of Agricultural Science at La Trobe University, Melbourne followed by a Bachelor of Veterinary Medicine and Surgery at Murdoch University in Perth, WA. Holly worked in both mixed and equine practices before moving into the corporate agriculture industry, initially as a pre-export and shipboard veterinarian before progressing to senior management roles. Holly's current role involves ongoing engagement with government and industry bodies and recently she was appointed to the Live Export Research and Development committee. Day-to-day Holly is involved in the animal welfare of livestock entering domestic and export programs in conjunction with commercial parties to ensure good welfare and business outcomes. Holly's passion is in the development and delivery of training programs in destination markets under the Export Supply Chain Assurance System (ESCAS). Holly believes Australia is creating a courageous pathway in animal welfare and has been instrumental in promoting and implementing World Animal Health Organisation (OIE) and higher animal welfare standards in destination markets. Holly is involved in live animal export to help get it right because she believes more can be achieved by being part of an export business management team to drive change through constant review and ongoing improvement.



Dr. Renee Willis
Murdoch University,
Australia

Renee has sailed as an Australian Government Accredited Veterinarian (AAV) on long haul and short haul voyages with both cattle and sheep to a variety of locations across South-East Asia and the Middle East. Renee studied a Bachelor of Veterinary Science at the University of Sydney. She worked in mixed and equine practices in Australia and the UK before starting out as a shipboard veterinarian and accredited stock person on live export vessels in 2015. As a PhD student at Murdoch University, Renee is currently working on an MLA/ Livecorp research project developing a suite of animal welfare indicators that can be used to monitor and record the welfare of livestock throughout the live export supply chain. For her research, she has followed a number of livestock consignments from pre-export facilities in Australia, on board livestock vessels and through to receival feedlot facilities. Renee is involved in the Livecorp stockperson's training and accreditation program. She has presented lectures and helped develop training materials on animal welfare during sea transport for veterinarians in the Middle East with the World Animal Health Organisation (OIE). In the future Renee hopes her research will generate methods for industry, including veterinarians and stock-people, to measure and report on animal welfare more effectively.

Dr. Holly Ludeman & Dr. Renee Willis

Harmony Agriculture and Food Company, Australia & Murdoch University, Australia

Live export: rare insights into a veterinarian's role



What is livestock export from Australia?

The Australian Live Export Industry (LEI) is large and diverse and makes a substantial economic contribution to the Australian agricultural sector. It has significant impacts on rural communities and the national economy. The LEI provides food to overseas markets where domestic production cannot meet local demand; these markets value Australian livestock imports as both economically viable and a source of high-quality food (DAWR 2017).

In 2017, Australia exported a total of 2.8 million live cattle (beef and dairy), sheep and goats that were valued at \$1.4 billion FOB (ABS, 2017). Exported livestock included: 870,000 cattle and 1.9 million sheep. The largest export market by volume was Kuwait receiving 646,218 sheep and 604 cattle (22.7% of all exported livestock). Qatar received 640,000 sheep and 1,648 cattle (22.5% of all exported livestock), whilst Indonesia took 511,878 cattle, 24 sheep and 7 goats (18% of all exported livestock; ABS, 2017).

Exporters of Australian livestock are regulated under the Australian Meat and Livestock Act, the Export Control (animal) Orders, the Australian Standards of Export of Livestock (ASEL) and

the Export Supply Chain Assurance System (ESCAS). These unique Australian legislative frameworks protect livestock welfare along the entire supply chain in markets across the globe. ASEL oversees livestock within Australia, during transport and until livestock are discharged in the destination country. The exporters' responsibility of livestock welfare continues under ESCAS even when ownership does not extend all the way to the point of slaughter in destination countries.

What are the roles of veterinarians in the Australian Livestock Export Industry?

Veterinarians are involved at all levels of the supply chain from source farms, quarantine facilities in Australia, onboard livestock vessels and further across borders as consultants in feedlots and abattoirs in importing countries. Veterinarians are also involved in the regulatory side of the industry in state and federal government, all the way up to senior decision- and policy-makers. Given the intensive nature of livestock export it's not surprising that there are many roles for veterinarians. Veterinarians are professional experts in animal health and welfare and form an integral part of meeting ASEL and ESCAS requirements in practice.

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Cattle loaded for China slaughter

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Veterinarians are required to be licenced by the Australian Government as Australian Accredited Veterinarians (AAVs) to perform pre-export or shipboard duties. AAVs are actively involved in the exporter meeting ASEL requirements and conditions of an exporters licence. An AAV is involved in every livestock consignment that leaves Australia. At a minimum this involvement may be pre-export protocolling of animals, carrying out the importing country's testing and treatment requirements either on farm or in quarantine, and/ or pre-export assessment of livestock as suitable and fit for transport under the ASEL. AAVs are required to travel on certain high-risk voyages to provide veterinary clinical services for livestock. The federal Department of Agriculture and Water Resources (DAWR) also requires reporting by veterinarians under their AAV licencing requirements.

Veterinarians may be employed as part of an exporter's management team or may have long term contracts as a service provider. These veterinarians are involved in all, or part, of the consignment risk assessments, consignment planning, preparation of livestock, voyage management, discharge and post discharge processes to provide oversight and active management of animal health and welfare. Being professional experts these veterinarians, as part of an exporter's management team, are

well positioned to facilitate discussions with importers or importing country government veterinarians to ensure commercial demand is not to the detriment of animal health, welfare or in breach of ASEL or ESCAS.

What happens during a sea voyage?

Shipboard AAV's provide veterinary services for the exporting company and are required to report to DAWR on the health and welfare conditions onboard the vessel. An AAV is required to accompany all long-haul voyages, ships on their maiden voyage, or any consignments that are deemed by the DAWR to require an increased level of care and monitoring. Often exporters will contract a veterinarian even if not specifically required by the DAWR to travel with the livestock; AAVs are well positioned and experienced to offer this service.

An AAV is present during vessel loading and works alongside the exporter's representative to ensure the livestock are loaded in accordance with the pre-agreed/approved stocking densities and load plan. High standards of handling during the loading process are crucial to minimise stress and the incidence of injury during early stages of the sea journey. During the voyage the shipboard AAV works with the accredited stockperson/s to oversee the management of livestock nutritional requirements. Prior to departure the shipboard AAVs order medication and veterinary equipment based on ASEL standards, experience, and the predicted risks for the voyage. They also liaise with the exporter to have input into decisions regarding the amount and type of feed the exporter is planning to load for the voyage.

Welfare outcomes for livestock on board are heavily influenced by the attentiveness of livestock management and by the ability or direction of the crew to work together in providing care to the livestock. Once the voyage has departed, there are not many commercial inputs that can vary. Achieving the best possible welfare outcomes is the only way commercial success of the voyage can be influenced. The livestock management at sea is overseen by the industry accredited stockpersons and the shipboard AAV. They work within fixed constraints of the voyage (including the ship's infrastructure, the number and skill of the crew, and the amount of provisions or supplies loaded) to provide the highest level of care to all livestock.

The daily shipboard routine involves thoroughly assessing the health of all animals, monitoring environmental conditions on decks, managing the delivery of feed, ensuring access to clean water, and management of bedding and the manure pad. Cattle and sheep are checked carefully before or during morning feeding; all animals should be standing and interested in feeding. Any livestock that are showing signs of disease or ill thrift, are slow to stand, or not engaging with their environment should be detected on morning inspection. These livestock are examined and given individual attention as required. Sick or injured livestock are moved to hospital pens for treatment, and animals not coping with the pen



Dorper sheep loaded for the Middle East environment are provided with individual care.

Daily morning meetings are held between the deck crew's representative (Bosun), Chief Officer, Captain, the AAV and the stock-people. The progress of the voyage and the management of the livestock are planned and discussed at this meeting. Issues commonly covered include calculation of feeding regimens, the sum of feed provisions remaining onboard, livestock water consumption, washing of the decks and provision of bedding, movement of stock between pens, any maintenance concerns, the voyage ETA and expected weather conditions. After the daily meeting, the AAV writes the daily report for DAWR and the exporter regarding the conditions on the ship and the health and welfare of the livestock.

In the earlier stages of the voyage, the AAV and stock-people will move livestock between pens to even out stocking densities. Gates may be taken out or rearranged to maximise access to ventilation outlets, and adjustments can be made

to optimise feed and water trough access. Chaff roughage is often manually provided in the middle of the day. Top up feeding to selected areas of the ship may also be required at this time.

All livestock are checked over the course of the afternoon to observe pen behaviour and continually assess environmental conditions on deck. Livestock will generally settle and rest until the late afternoon feed. Any pens of stock not sitting down to rest will indicate the need to assess the pen environment and possibly adjust their bedding or reduce the stocking density.

The role of the shipboard AAV and stockpersons involves not only the calculated provision of nutritional resources (i.e. unrestricted access to clean water and the provision of adequate feed of an appropriate composition), but also the observation of livestock as they interact with each other and their environment. Animals that are being transported by sea have obvious limitations to the range of natural behaviours they can perform, however, their ability to perform basic behaviours to maintain their normal physiological state is essential.

On arrival at the destination port, the shipboard AAV will communicate with the receiver

regarding the health and performance of the livestock during the voyage. They will oversee and report on the handling practices during the discharge process and continue to provide ongoing care to livestock on board until the last animals have been discharged from the vessel. It can take several days to discharge the ship and operations will often run at all hours of the day. At the completion of the voyage, the veterinarian will provide detailed voyage records and animal treatment history to the exporter. They are also required under ASEL to submit an end of voyage report to DAWR.

What happens post-livestock arrival in destination market?

Since the implementation of ESCAS in 2011, the LEI in-market programs have delivered training to more than 11,856 participants in destination countries. The allocation of those participants across regions was 3,662 in EMENA, 4,359 in Indonesia, 1,033 in Vietnam and 2,802 in SEA (Livecorp 2017-2018). This training is delivered, at the request of exporters and importers, by qualified staff many of whom are veterinarians. The programs have delivered improved animal health and welfare outcomes through various programs such as nutrition

and feedlot management, low stress animal handling, slaughter theory and technique, stunner use and maintenance, Standard Operating Procedures, and identifying abattoir risks.

One of the most rewarding roles of veterinarians in the Australian livestock export supply chain is the improved management of livestock health and welfare in importing countries. Training throughout the supply chain is an ongoing commitment of the Australian livestock export industry. The industry has improved knowledge of animal welfare across social, religious and language barriers across the globe and Australian veterinarians have been key consultants in this area.

What happens in the Future?

Poor animal welfare is not an economically viable practice and will not support the sustainability of any livestock industry. While demand for affordable protein continues to grow, live export will be valuable to the Australian economy, the Australian agricultural sector, and the economies of importing countries.

Common ground may not be easily found and there is a highly emotive force against this industry. While the social, cultural, and commercial challenges continue veterinarians play an essential role in ensuring there is transparency, continuous review, and progressive improvement in animal welfare in all parts of the live export supply chain. As veterinarians, we are both inspired to be part of an industry that is courageous in pushing boundaries for compliance within Australia as well as pushing improvements of animal welfare standards in importing countries around the globe.

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In-market training conducted by the Livestock Export Program (jointly run by Livecorp and Meat & Livestock Australia). Image courtesy of Livecorp.

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