

Attitudes of stakeholders to animal welfare during slaughter and transport in SE and E Asia

M Sinclair^{*†}, S Zito[†], Z Idrus[‡], W Yan[§], D van Nhiem[#], P Na Lampang[†] and CJC Phillips[†]

[†] Centre for Animal Welfare and Ethics, School of Veterinary Sciences, The University of Queensland, Gatton, Queensland 4343, Australia

[‡] Institute of Tropical Agriculture, Department of Animal Science, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

[§] Guangzhou University, 230 Daxuecheng Outer Ring West Road, Panyu, Guangzhou, Guangdong, China

[#] Vietnam National University of Agriculture, Gialam, Hanoi, Vietnam

[†] Suranaree University of Technology, 111 University Avenue, Muang District, Nakhon Ratchasima 30000, Thailand

* Contact for correspondence, requests for reprints and a copy of the questionnaire: m.sinclair6@uq.edu.au

Abstract

Understanding cross-cultural differences in attitudes to animal welfare issues is important in maintaining good international relations, including economic and trade relations. This study aimed to investigate the attitudes of stakeholders towards improving the welfare of animals during slaughter and transport in four key SE and E Asian countries: China, Thailand, Vietnam and Malaysia. Logistic regression analysis of the associations between demographic factors and attitudes identified nationality as the most significant factor influencing attitude. Motivating factors for improving welfare were ranked according to their importance: religion, knowledge levels, monetary gain, availability of tools and resources, community issues, approval of supervisor and peers. Strong beliefs in the influence of animal welfare laws, the power of the workplace and the importance of personal knowledge were shared by all countries. In addition, religion and peer consideration were significantly associated with attitudes in Malaysia and Thailand, respectively. The findings of this research will assist in the development of international animal welfare initiatives.

Keywords: animal welfare, Asia, attitudes, culture, slaughter, transport

Introduction

The animal agriculture sector is the most economically important interface between humans and other species. It also has the largest number of stakeholders: approximately 68 billion animals are slaughtered for meat globally each year alone (Food and Agriculture Organisation [FAO] 2016), which presents significant potential for animal suffering (Rollin 1995), and it may be considered that for some their lives are ‘not worth living’ (Mellor 2016). The recent growth in meat consumption is greatest in Asia; for example, in China consumption has increased from 10.2 to 13.5 billion animals in the last ten years (FAO 2016). To meet this need, international trade in live animals and animal products has increased (FAO 2016), facilitated by the creation of Fair Trade Agreements, advances in technology and transportation, and the resulting globalised trade. Asia accounts for 39% of global meat production, with China producing almost twice as much meat as the second highest producer — the United States of America (FAO 2016). Although there are major business interests involved in much of the global production of animals, the income of 70% of the world’s poorest people is tied to production animal industries, including many in Asia (World Bank

2016). This is particularly pertinent for trade in animal products between countries in Asia, many of which are exploring animal welfare policy options, and developed countries where there is already advanced animal welfare policy and awareness (Veissier *et al* 2008). In Europe, which receives many meat animals from Asia, there is an increasing consumer demand for animal products produced in ways that attempt to minimise animal suffering (Verbeke *et al* 2010).

Many challenges exist in progressing animal welfare in a global context, with great variation in legislation, policy and agricultural landscapes worldwide. It is for this reason that the OIE (World Animal Health Organisation) has developed standards focused on transport and slaughter of production animals and farmed fish (OIE 2011). Based on a scientific understanding of animal welfare and widespread consultation, the OIE Terrestrial and Aquatic Animal Codes have been agreed upon by 180 nations that are signatories to the OIE. It is the responsibility of each country to implement the standards, but there have been some notable instances of lower standards of animal welfare in Asian countries than would be acceptable in developed countries (Tiplady *et al* 2012).

The ‘Theory of Planned Behaviour’ acknowledges that attitudes are an important predictor of behaviour intentions,

along with subjective norms and perceived behaviour control (Azjen 1991). Factors that influence human attitudes towards animals include emotional responses to other species, the extent to which an animal is of instrumental use and value to the human, and many individual human factors, such as gender, income, and whether they grew up with pets (Serpell 2004). With improvements in statistical techniques, these factors can be evaluated separately for their ability to independently predict the contribution of each to the outcome through, for example, multinomial logistic regression modelling. Cultural differences in attitudes towards animals may derive from regional differences in the domestication process, human totemism of animals and mythological history (Dolins 1999).

A collaborative initiative that will encourage engagement in changing attitudes towards animals requires an understanding of regional cultures. Initiatives that are locally defined, developed and led may avoid the risk of imposing external international opinions onto an at best unreceptive and at worst offended audience, which could compromise its success. For these reasons, working to understand local stakeholders and collaborating in an engaging way are vital keys to progress initiatives, and can improve success and uptake (Marciano 2010).

Previous studies have identified the importance of understanding cultural audiences. For example, Lowe and Corkindale (1998) demonstrated the influences cultural values and attitudes have when comparing Australians and Chinese nationals on perceptions towards marketing stimuli. They concluded that “one cannot assume that the same set of values will influence two different groups of consumers’ responses for the same marketing stimuli” (Lowe & Corkindale 1998; p 864). This may apply to country, and region within country, or socio-political region.

Differences in cross-cultural attitudes to animals have been reported. For example, attitudes towards animal welfare and rights differ between Eurasian nations, with university students from European countries expressing more concern for animal welfare and rights than those from Asian nations (Phillips *et al* 2012). A relationship between attitudes towards animal welfare and rights and affluence has been suggested and is supported by a positive correlation between respondent weekly expenditure and concern for animal welfare and animal rights (Phillips *et al* 2012). Attitudes of future industry stakeholders, such as veterinary science and agricultural students, about livestock slaughter and transport also differ between nations in SE and E Asia (Ling *et al* 2016). Compared to respondents from Malaysia, China or Vietnam, respondents from Thailand found it less acceptable to kill animals, and compared to respondents from China or Vietnam, Malaysian respondents found it less acceptable for animals to experience pain and suffering during slaughter (Ling *et al* 2016). As well as national differences, there are regional differences in these countries which are of less significance than differences between regional groups within the countries (Minkov & Hofstede 2012). Hence, nations are valid units in which to evaluate regional differences in attitudes to animals in SE and E Asia.

Current cross-cultural animal welfare attitudinal research has been most commonly focused on respondents that are accessible for large-scale surveys, such as university students. To our knowledge no research has been conducted with the stakeholders that are the most accountable for the welfare of animals during slaughter and transport in Asia — the slaughterers, transporters, agri-business owners, government agri-vets and agri-policy makers. This study aimed to assess the attitudes of Asian livestock transport and slaughter industry stakeholders to animal welfare and, in addition, to determine the perceived motivating factors and barriers to improving animal welfare. This information will assist in determining whether regionally tailored animal welfare initiatives are required in SE and E Asia.

Materials and methods

As part of a larger OIE project to improve knowledge around animal welfare standards, trainers (n = 44) with relevant livestock industry knowledge in four key SE and E Asian countries attended one of four two-day workshops (held in each country) presented by four international experts in livestock transport and slaughter. Attendees received a *per diem* expenses allowance, a travel allowance, free lunch, refreshments, and a memory stick with comprehensive training resources (available at www.animalwelfarestandards.org). The trainers then delivered forty-four one-day regional workshops to stakeholders (about 25 in each) in the livestock transport and slaughter industry in geographically relevant locations within the People’s Republic of China (hereafter China; n = 16), Malaysia (n = 6), Thailand (n = 11) and Socialist Republic of Vietnam (hereafter Vietnam; n = 11). The locations within China included Guandong, Hain, Hubei, Hun, Shandong, Zhejiang and Jiangxi provinces, Hanoi, Halphong, Vinh, Dang, Vungtau, Binhduong and Cantho within Vietnam, Khon Ratchasima, Udon Thani, Champon, Khon Kaen, Sakon khon, Petchaburi and Bangkok within Thailand, and Zon Selatan, Tengah, Utara, Sabah, Sarawak, Pantai Timur and Kuala Lumpur in Malaysia. These countries were selected because of their important role in global import and export livestock industries and because of their diverse religious and cultural attributes. Stakeholders were invited to the workshops and also to participate in the research by the workshop trainers, with the only selection criteria that they must be employed and involved in the local livestock slaughter and transport industry. Participants were sought from among slaughter personnel, transporters, livestock slaughter and transport business owners and managers, senior livestock veterinarians, livestock farmers, agriculture academics and government agriculture representatives (see Table 1 in the supplementary material to papers published in *Animal Welfare* on the UFAW website: <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>).

Participants were anonymously surveyed using a paper-based questionnaire at the start of the slaughter and transport workshops, which had been developed in English through consultation with academic and industry experts in the animal welfare field. The survey was translated into Bahasa, Mandarin, Thai and Vietnamese and then back-translated to ensure meaning consistency, with changes to the original questionnaire where necessary. The questionnaire was administered to the trainers at the start of their workshops, so that they were familiar with it and because they were also deemed to effectively be stakeholders in the industry. These were incorporated with the stakeholders' responses, increasing the total number of respondents to 1,066.

In the questionnaire, respondent demographics were obtained first: country, region, sex, age, residential area, religion, religiosity, their role within the industry, and how their industry knowledge was gained (formal qualifications or otherwise) and over what period. The rest of the questionnaire consisted of four key question sets with responses to each question measured on a Likert scale from 'strongly disagree' to 'strongly agree'.

The first non-demographic set of eight questions focused on general attitudes to animal welfare, which is a central component of the Theory of Planned Behaviour, including:

- The importance placed on animal welfare during slaughter and transport;
- How satisfactory animal welfare in the respondents' workplace was believed to be;
- Whether the respondent intended or felt confident to make animal welfare improvements in their workplace; and
- Whether the respondent had tried to make animal welfare improvements in the past.

The second question set investigated nine key factors influencing the stakeholders' evaluation of animal welfare during slaughter and transport. These included religion, personal beliefs, the extent to which there are more pressing issues in the community, personal and community monetary gain, importance within the workplace and amongst peers, knowledge and the relevant laws. These are important drivers of perceived behavioural control, a second major component in the Theory of Planned Behaviour, and which was the subject of the third set of questions.

The third set of 12 (slaughter) or 13 (transport) questions focused on the respondents' evaluation of their ability to improve animal welfare during slaughter and transport, and the factors that may enable or hinder their ability to effect improvement. These included the same factors as the second question set, but with the addition of company approval of improving animal welfare, physical workspace, available tools and resources, and vehicle design (transport only).

The final set of eleven questions focused on sources of encouragement to improve animal welfare, and which sources respondents are more likely to respond favourably to. This relates to the stakeholders' ability to turn intentions into actual behaviour, which is affected by their level of behaviour control. Those investigated were:

- Prescription by local government, local organisations, local law enforcement, western international organisations;
- Prescription by law, workplace, supervisor, community elders;
- The respondent seeing moral or monetary gain in change, or seeing others making the change.

The survey was reviewed by three sociological researchers, piloted with nationals from each participating country and amended to ensure comprehension and relevance. Ethical approval for this study was granted by the University of Queensland Human Ethics Committee (Project Identification Code: 2015000059).

Statistical analysis

The data were initially collated and quality controls employed to remove obviously erroneous data-points. Least squares means of rated importance for each question were determined, by nation, to allow for ranking of factors. Multivariable ordinal logistic regression analyses were performed in Minitab® to assess the significance of the relationships between respondent demographics (the independent variables) and the distribution of the Likert scale responses for each question (the dependent variable). For each independent variable (demographic factor) the reference category chosen was the most numerous response category (for example, in nationality comparisons the most numerous was Chinese). The model used an iterative-reweighted least squares algorithm with a logit-link function. No starting estimates were provided and unusual observations were identified but not removed.

Importance rankings of factors influencing attitudes to animal welfare were determined using Fisher's LSD Method and 95% Confidence Intervals in Minitab®. Plots of residuals were inspected to ensure they approximated a normal distribution. All probability values were considered significant at $P < 0.05$.

This paper focuses on the influences of nationality, comparing responses of participants in China, Malaysia, Thailand and Vietnam. Results assessing the influences of the other demographic factors will be presented subsequently.

Results

All of the stakeholders who attended the workshops completed the questionnaire at the start, yielding 1,022 respondents and a 100% response rate. Three surveys were disqualified from analysis due to being incomplete.

The respondents were from a wide variety of occupations within the livestock transport and slaughter industry: 49% held roles working directly with the animals, 27% were supervisors, business owners or managers within the industry, and 23% were livestock veterinarians, both working in the field and in advisory roles (Table 1; <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). The majority of respondents (684; 69%) were male and aged 26–35 (361; 36%) or 36–45 (248; 25%), with 16% (166) under 25, 15% (150) between 46 and 55, and 6% (63) over 56. The majority of the respondents (563; 60%)

reported having gained their knowledge through formal qualifications in agriculture, with 37% (354) having gained it through hands-on farm employment. Slightly more respondents resided in an urban/metropolitan (566; 57%) region than in a rural (421; 43%) region. Of the 991 respondents who identified their theological affiliation, 43% (431) identified as Buddhist, 37% (370) as atheist, 7% (76) as Muslim, and 4% (43) as Christian.

Attitudes to animal welfare during slaughter and transport

Most respondents in all four countries agreed with the statements that the welfare of animals during transport and slaughter was important to them (see Table 2; in the supplementary material to papers published in *Animal Welfare* on the UFAW website: <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). Respondents were less likely to agree that the welfare of the animals while being slaughtered was satisfactory in their workplace, particularly in China and Thailand where the mean agreement was 3.18 and 3.39, respectively. Respondents in Thailand, Malaysia and Vietnam agreed more that the welfare of the animals while being transported was satisfactory in their workplace than Chinese respondents. For all of these statements the order of agreement was from highest to lowest: Malaysians, Vietnamese, Thai and Chinese respondents (Table 2; <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>).

There was agreement in all four countries that most people who were important to them would approve of them making improvements to animal welfare; again this was strongest in Malaysians and weakest in Chinese, but Thai respondents showed stronger agreement than Vietnamese (Table 2; <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). Similarly, in all four countries there was agreement among respondents that they intended to make improvements in the welfare of animals and that they had confidence in their ability to make these improvements, with Malaysians and Thais agreeing most, then Vietnamese and Chinese respondents which showed equal agreement. Most respondents from China, Thailand and Malaysia agreed that they had tried to make improvements in the welfare of animals in the past, with a lower level of agreement among Vietnamese respondents.

Influencing factors

Stakeholders' evaluation of animal welfare during transport and slaughter was most influenced by the factor 'government laws' (including monitoring) (hereafter just laws) (Table 3; supplementary material to papers published in *Animal Welfare* on the UFAW website: <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). This was ranked the highest influencing factor in all countries, except in Malaysia, where religion was more important, and in Thailand where it was rated similar to the importance of animal welfare to the respondents' co-workers/peers (Table 3; <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). Co-workers were therefore rated very important to personal attitudes by Thai

respondents, but were not as highly rated by those from other countries. Compared to Chinese respondents, respondents from the following countries rated factors higher as follows: Vietnam, laws, personal knowledge; Thailand and Malaysia, importance to peers and religious beliefs; Malaysia, importance in workplace, personal beliefs.

Laws were again rated as the most important factor influencing respondents' ability to make improvements to animal welfare during *slaughter* in all countries, except in Malaysia, where religion was more important, and in Thailand where laws were similarly rated to company approval (Table 4; supplementary material to papers published in *Animal Welfare* on the UFAW website: <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). Religious beliefs and personal beliefs rated the lowest in both China and Vietnam, whereas 'personal and community monetary benefit' and 'more pressing community issues' were rated the lowest in Thailand and Malaysia.

Compared to Chinese respondents, respondents from the following countries rated factors higher as follows: personal knowledge, importance to peers, Thai, Malaysians and Vietnamese; religious beliefs, workspace, personal beliefs, Malaysians and to a lesser extent Thai; importance in workplace, Thai; company approval, Malaysians; and government law/monitoring, Vietnamese. Personal beliefs were rated lower by Vietnamese respondents than by Chinese respondents.

Laws were again rated as the most important factor influencing respondents' ability to make improvements to animal welfare during *transport* in all countries, except Malaysia, where religion was again rated as more important (Table 4; <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). Religious beliefs were again the lowest rated influencing factor in China, and Vietnam where it was equal with personal beliefs. The design of the vehicles and personal monetary gain were rated as the least influential factors in both Thailand and Malaysia, equal with 'the extent to which there are more pressing concerns' and community monetary gain, respectively. Compared to Chinese respondents, respondents from the following countries rated factors higher as follows: company approval, importance to peers, workspace, Thai and Malaysians; personal knowledge, Vietnamese, vehicle design, Malaysians. Tools/resource availability, personal beliefs, religious beliefs, monetary gain were all rated of less importance by Vietnamese than Chinese respondents.

Sources of encouragement to improve animal welfare most likely to elicit favourable response

Respondents from all countries agreed that they felt neutral or would make improvements in response to changes prescribed by all bodies (local government, local organisations, local law enforcement, western international organisations, legal bodies, workplace supervisors), except in the case of changes prescribed by a community elder or leader, in which case respondents disagreed in Vietnam (Table 5; supplementary material to papers published in *Animal Welfare* on the UFAW website: <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>).

Compared to respondents from China and Vietnam, respondents from Thailand and Malaysia were more likely to agree that they would make improvements to animal welfare if there was the opportunity for personal monetary gain, if the changes were prescribed by their workplace, their supervisor or a western organisation.

Respondents from Vietnam were more likely than those in other countries to agree that they would make improvements to animal welfare if changes were prescribed by law or local law enforcement police. Respondents from China were less likely to agree that seeing moral value in changing practices would influence them to make changes to animal welfare compared to those from Thailand, Malaysia and Vietnam.

In all countries, respondents stated that they were most encouraged to change their practices if prescribed by law, and equally where they saw moral value in changing practices, except in Thailand where 'moral value' was placed just above 'law', and in Malaysia where 'law' was placed just above 'moral value'. Changes prescribed by Western international organisations were ranked the least likely to encourage change in all countries, except in Vietnam where 'change prescribe by a community elder or leader' was lower, and in Thailand where 'I see others making the change' ranked as equal lowest (Table 5; <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>).

Within country ranking of influences on attitudes and factors that would elicit change

The ranking of factors influencing respondents' personal evaluation of animal welfare during transport and slaughter was essentially the same for China and Vietnam. Malaysian respondents differed by their ranking of religious beliefs first, whereas these were ranked last by Chinese and Vietnamese respondents (Table 6; supplementary material to papers published in *Animal Welfare* on the UFAW website: <http://www.ufaw.org.uk/t-ufaw-journal/supplementary-material>). Malaysian respondents also ranked personal beliefs higher than Chinese and Vietnamese respondents. Thai respondents ranked co-workers higher than respondents from other countries and 'more pressing community concerns' lower than respondents from China.

In relation to factors that influenced respondents' ability to make improvements to animal welfare during slaughter, co-workers were again ranked higher by Thai respondents than Chinese respondents. Religious beliefs were ranked higher by Malaysian respondents than by, in particular, Vietnamese and Chinese respondents, and to a lesser extent Thai respondents. Personal beliefs were ranked higher by Malaysian than Vietnamese and Chinese respondents.

For factors influencing transport improvements, company approval was seen as less important than the law by respondents in Vietnam, but not in other countries. Religious beliefs were seen as more important and vehicle design less important by respondents in Malaysia than the other countries. Sources of encouragement which would enable improvements in animal welfare to happen were focused on the law and personal value.

Discussion

This study demonstrated that, in the Asia Pacific region, stakeholders' attitudes to animal welfare during slaughter and transport were significantly influenced by country of residence. Historically, our four countries have significantly different cultural origins, there being a strong influence of Indian culture in Malaysia and Thailand but almost none in Vietnam and China, which are considered part of the East Asian cultural sphere. Within this sphere there are differences between China and Vietnam in their respect for family, which dominates in China, and respect for the clan, a larger grouping, which dominates in Vietnam. This is despite their common socialist history in recent times. As well as these major influences, there are differences between subcultures within each country, but these are usually subservient to the national differences (Minkov & Hofstede 2012).

As well as culture, and included in that, there are major differences in religion and religiosity between our four countries. Malaysia and Thailand have an overwhelming majority of their population that strictly follow Islamism and Buddhism, respectively, whereas in China and Vietnam less than one-third of the populations believe that religion is important in their life (Crabtree 2010).

Country of residence was shown to be strongly associated with factors influencing respondents' evaluation of animal welfare during slaughter and transport, and respondents' perceived ability to make improvements to animal welfare. Despite this, some important similarities in attitudes emerged between countries across the region. Most notably, the strength of influence that government laws have on the evaluation of animal welfare, the perceived ability to make improvements, and the avenue most likely to encourage improvement change. This suggests that animal welfare change is more likely to be successful when it is legislated, which affirms the importance of legislation to improve animal welfare. The concept of an animal welfare focus of society is still new across much of Asia, and animal welfare legislation is either newly implemented or under development in each of the countries studied. Despite the importance of government law, no animal welfare legislation currently exists in Vietnam, and only minimal legislation specific to veterinarians and laboratory workers exists in China. Although Thailand has passed an Animal Anti-Cruelty and Welfare Act through Parliament and Malaysia has a proposed Animal Welfare Bill (World Animal Protection Index 2016), neither has yet been enacted. This study shows the importance of the presence of animal welfare law in human behaviour modification for the first time. Monitoring relevant to animal slaughter and transportation practices was included with government laws, since legislation is unlikely to be successful unless monitored effectively to ensure compliance.

In addition, respondents across all countries reported that they are more encouraged to change their practices to improve animal welfare if they also 'see moral value' in the change. In contrast to the extrinsic influence of government laws, moral value and moral reasoning is an intrinsic

influence. Further research into the moral position of industry stakeholders would provide helpful information in developing morally based education initiatives around animal welfare during slaughter and transport. ‘Changes prescribed by a western international organisation’ ranked as the least likely to encourage change in all countries, except Vietnam where ‘changes prescribed by my community elder community leader’ ranked lower. Although some of these notions have been anecdotally acknowledged in not-for-profit activities (Wildlife SOS 2009; Lapid *et al* 2012), this study suggests for the first time that locally run initiatives, with local knowledge, preferably reinforced by a legal framework, are most likely to see engagement and success.

Most respondents, regardless of their country of residence, agreed that the welfare of animals during slaughter is important to them, but it was less common for respondents to have tried to make improvements to welfare in the past. In addition, while most respondents in all countries expressed confidence that they *could* make improvements to welfare, fewer intended to actually make improvements. This disparity suggests that people report that animal welfare is important to them, and that they can make change, more often than they actually do, and that this was similar across all countries. For example, a recent study with veterinary science students found that respondents were more likely to report caring about animal welfare issues than they were to take action when a morally disagreeable action was being performed (Verrinder 2016). This may suggest that the attitude-behaviour link is not direct, and may be impacted by additional external factors, such as a perceived power to change welfare. It is also possible that, whereas the respondents were truthful in indicating that they had not improved welfare, they were keen to indicate that they would attempt to do this in future.

Several studies of consumer concern for animal welfare, and willingness to pay for animal products that attempt to reduce suffering have found that positive animal welfare attitudes alone do not necessarily translate into willingness to pay higher prices for higher welfare animal products (Bennett *et al* 2002). Other factors such as trust around certification (Nocella 2010) or the sensory properties of the products (Napolitano 2008) may have greater impact on consumer behaviour. This may suggest applying caution when expecting direct correlations between broad attitudes (such as concern for animals) and specific behaviours (such as consumer choices). Broad attitudes probably relate better to broad behaviours and motivations, and it is important to utilise specific questions when predicting specific behaviours.

In all countries, the importance of animal welfare to the respondents’ company was considered significant in both evaluation of animal welfare and perceived ability to make improvements to animal welfare during both slaughter and transport. This is understandable in the light of the growing attempt by large companies to control welfare standards and the necessity to adhere to company values to ensure continued employment. In addition, respondents in all countries tended to agree that knowledge about animal

slaughter and animal transportation practices influenced their evaluation of animal welfare and their ability to make improvements. Employees are often limited in their ability to effect change in laws and workplaces but are able to increase their personal knowledge. Consequently, education programmes tailored to stakeholders around improving animal welfare during slaughter and transport are likely to result in improvements to animal welfare on the ground. Cognitive-behavioural training programmes for stock-people within the livestock industry in Australia have been advocated (Hemsworth 2003). Further research is suggested to investigate the methods and models of education most likely to be successful with stakeholders in the livestock transport and slaughter industry in Asia.

From this discussion, the highly rated factors that were common to the respondents of Malaysia, Vietnam, China and Thailand suggest that animal welfare improvement programmes should focus on four key areas:

- Development, implementation and monitoring of animal welfare legislation by governments;
- Increasing the importance of animal welfare to companies in the livestock slaughter and transport industries;
- Improving the animal welfare knowledge of industry stakeholders;
- Researching and developing morally based education initiatives around animal welfare during slaughter and transport.

Not only did some similarities exist in the most influential factors in the evaluation and improving of animal welfare across the countries, some also existed in the least influential. ‘My monetary gain’ and ‘monetary gain to my community’ rated amongst the lowest of influencing factors across all assessed countries. Many respondents may not be in a position to benefit monetarily from improving animal welfare; financial benefits may be seen exclusively by business owners and this may have resulted in the tendency for non-business owners to report less monetary influence (Sinclair *et al* 2017). However, survey respondents may under report the importance of money in their lives (Rynes *et al* 2004), and tend to answer questions in ways that are viewed more socially desirable (Grimm 2010).

This study also provides evidence that there are country-specific influences on attitudes towards animal welfare and factors influencing stakeholders to improve animal welfare.

Malaysia

The key difference between Malaysian respondents and those in all other countries was the extent to which religion was an influencing factor in the welfare of animals. Religion was rated as the most important factor in Malaysia when evaluating animal welfare during slaughter and transport, and when considering ability to make improvements specifically during slaughter. In Malaysia, 61% of the population follow the Islamic faith (PEW Research Centre 2016), which was reflected in respondent demographics. On a global scale, Malaysia ranks amongst the most religious countries, with a religiosity score of 81/100 (Win-Gallup

International 2012). This is in contrast to China, which ranked lowest with a score of 14/100, and Vietnam, also low with a score of 30/100. In order for meat to be halal (permissible to eat by Muslims), Islamic doctrine mandates a variety of practices intended to ensure 'unnecessary suffering is avoided', and therefore it is understandable that it should be highly influential when considering animal welfare (Halal Food Authority 2016). Although religion appeared to be a dominant influence on respondents, it is possible that there were also cultural differences between our chosen countries that were not captured by our survey.

In addition, compared to respondents from Thailand, Vietnam and China, Malaysian respondents were more likely to agree that animal welfare was important to them, that they have tried to make animal welfare improvements in the past, and almost all factors included in the study were considered more important. This may be attributed to Malaysia being a more developed nation, ranking 62nd on the UN's Human Development Index, compared to China, Thailand and Vietnam which rank 90th, 93rd and 116th, respectively (United Nations Human Development Index [UN HDI] 2015).

It therefore appears that Malaysian livestock and slaughter stakeholders are interested in improving animal welfare, and that engagement of stakeholders through religious avenues may be beneficial in advancing animal welfare in this country, in addition to the areas of focus common to all four countries. To this end, further research to better understand attitudes to animal welfare in halal meat production systems and how to leverage religion to improve animal welfare would be beneficial.

Thailand

Respondents from Thailand were the only ones to report that the importance of animal welfare to their work colleagues was a highly influential factor in evaluating animal welfare, and one of the top factors in both ability to improve welfare during slaughter and transportation. Contradictorily, Thai respondents were unlikely to rate 'seeing others make a change' as likely to change their behaviour, which may suggest that the importance of animal welfare to their peers is not due to a peer pressure convention of conformity. However, this disparity could suggest that Thai respondents are fulfilling a cultural priority of respect for peers in a community-focused culture. In contrast to respondents in other countries, Thai respondents also indicated that they are most likely to change their behaviour if they see moral value in doing so.

China

In China, the importance of the availability of tools and resources as an influence on ability to make improvements to animal welfare during both slaughter and transportation was evident, whereas this was not an important factor in Vietnam and possibly Malaysia. Further research to investigate the specific tools and resources that are required to facilitate improvement to livestock welfare during transport and slaughter could be of benefit in China.

In contrast to Malaysia, religious beliefs were not important to respondents in China in influencing attitudes to animal welfare. This could be explained by the high reported number of atheists in China (65.5% of Chinese respondents in this study and 61% in the wider Chinese community; Crabtree [2010]). Instead it was very common for Chinese respondents to view the importance of animal welfare in the workplace and company approval as important influences on their attitudes towards animal welfare. This and the lack of influence of personal beliefs on attitudes to animal welfare suggest that Chinese stakeholders may place more value on the collective than their personal values and opinions. This is supported by the Hofstede cultural dimensions scale, which rates China amongst the highest of the 'collectivist' rather than 'individualist' nations, meaning people are more likely to act in the interests of the group and not necessarily of themselves (Hofstede Centre 2011). The present study also suggests that Chinese stakeholders are more focused on practical influences, which is reflected in their highest rating for the law, knowledge, tools and resources.

In general, Chinese respondents reported the lowest levels of importance of animal welfare, were least likely to report they had tried to improve animal welfare, least likely to report that they were confident they could improve animal welfare, and also least likely to report that they intended to make improvements to animal welfare compared to respondents from other assessed countries. This could be reflective of a cultural tendency to take more neutral middle point (less extreme) views in surveys (Church 1987; Harzing 2006), in particular with questions of moral judgment (Culpepper *et al* 2002), but it could also be reflective of the lack of focus on animal welfare in China in the recent past, which is supported by Phillips *et al* (2012). In addition to the introduction of animal welfare legislation, and company-focused initiatives to build knowledge and capacity, benefit may be achieved in China by focusing on disseminating the commercial benefits of improving welfare for livestock companies.

Vietnam

Respondents in Vietnam were more likely to report law as an influencing factor in animal welfare, compared to respondents from China. Currently, no legal framework for animal welfare exists in Vietnam, although it is reportedly under development (World Animal Protection 2016). This highlights the importance of developing legislation in Vietnam, and suggests that this could be of great benefit to improving animal welfare in the Vietnamese livestock industry.

Similar to Chinese respondents, Vietnamese respondents reported that religion and personal beliefs were the least influential factors in their evaluation of animal welfare, and their ability to improve it. Both China and Vietnam share a similar culture, geographical proximity, and a shared history of communism. These similarities in influencing factors between China and Vietnam serve to reinforce the fact that geopolitical and regional culture plays a strong role in attitude, and should be taken into account when devising regional strategies for effect change, rather than relying on geographical nation borders alone.

The primary limitation of this study was the potential for bias introduced by the recruitment method. The respondents were recruited from stakeholders who had been invited by local trainers to attend capacity-building workshops on animal welfare, possibly because they were thought to have an interest in animal welfare. If these people were more interested than other stakeholders in animal welfare they may not have been representative of the wider population of industry stakeholders. In an attempt to reduce this potential for bias towards stakeholders interested in animal welfare, all country co-ordinators and local trainers were advised of the selection criteria for the workshops; which included employment within the livestock industry in their country, and ability to attend the workshop. Attendees were not invited based on a proclaimed interest in animal welfare.

Animal welfare implications

For parties interested in advancing animal welfare in the region, the results of this study suggest that advocating for and facilitating the development of animal welfare legislation, building awareness of current legislation, and monitoring and enforcement of legislation would be a valuable strategy. This could represent an opportunity to strengthen and reinforce international OIE guidelines, building awareness around accountability to meet these requirements, and a base from which new laws and law reform can develop.

The influence of the workplace on ability to improve animal welfare during slaughter and transport demonstrated in this study suggests that building awareness amongst business managers, owners and supervisors about the benefits of improving animal welfare may increase the likelihood of engaging business managers and employees in efforts to improve animal welfare. Businesses should be encouraged to incorporate higher welfare standards into key performance indicators and initiate company-based training workshops to harness the power of their influence and empower improvements to animal welfare during slaughter and transport in their industry. More fundamentally, the findings of this study suggest that engagement of stakeholders in animal welfare improvement initiatives will be more likely when initiatives are tailored to local audiences.

Conclusion

The influence of government laws, the influence of the workplace and the influence of personal knowledge were shared by stakeholders in all countries in regards to attitudes to animal welfare. The significant influence of seeing moral benefit to behaviour change demonstrated in this study indicates that it may be beneficial to incorporate ethical and moral reasoning activities into corporate training programmes, in addition to focusing on the commercial benefits of animal welfare improvements.

Specifically in Malaysia, religion was a very strong motivator for people to change their practices in order to improve animal welfare. Consequently, future animal welfare initiatives, particularly those seeking to improve animal welfare during slaughter could benefit from seeking to engage religious leaders and scholars in sanctioning and introducing better slaughter practices (such as stunning).

The country in which the respondents lived was a significant factor influencing stakeholders' attitudes to animal welfare during slaughter and transport in the Asia Pacific region. In addition, changes prescribed by western international organisations were rarely cited as an influence to change practice across all countries. This highlights the importance of understanding and engaging local communities in initiatives, tailoring the initiatives to the relevant culture, and encouraging local leadership.

Further research could focus on the key factors that emerged as most influential in this study, for example, targeted focus groups and/or interviews with key stakeholders which were identified in this study (such as religious leaders in Malaysia and company directors in Thai livestock industries).

Acknowledgements

This project was a collaboration between the University of Queensland in Australia, and University Putra Malaysia, under the framework of the New Zealand and Australia World Animal Health Organization (OIE) Collaborating Centre for Animal Welfare and Bioethical Analysis. It was funded by the New Zealand Government Ministry of Primary Industries, the European Commission via the World Animal Health Organisation, World Animal Protection, Universiti Putra Malaysia (UPM), the Malaysian Government Department of Veterinary Services via UPM, and the Australian Government Department of Agriculture, Fisheries and Food. The authors acknowledge Dr Samia Touksati for guidance in survey question construction, and Dr Fritha Langford for review of the paper.

References

- Ajzen I** 1991 The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50: 179-211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Bennett RM, Anderson J and Blaney RJ** 2002 Moral intensity and willingness to pay concerning farm animal welfare issues and the implications for agricultural policy. *Journal of Agricultural and Environmental Ethics* 15(2): 187-202. <https://doi.org/10.1023/A:1015036617385>
- Church AT** 1987 Personality research in a non-Western culture: The Philippines. *Psychological Bulletin* 102: 272-292. <https://doi.org/10.1037/0033-2909.102.2.272>
- Crabtree S** 2010 *Religiosity highest in world's poorest nations. Gallup report.* <http://www.gallup.com/poll/142727/religiosity-highest-world-poorest-nations.aspx>
- Culpepper RA, Zhao L and Lowery C** 2002 Survey response bias among Chinese managers. *Academy of Management Journal* 1: J1-J6. <https://doi.org/10.5465/APBPP.2002.7516876>
- Dolins FL** 1999 *Attitudes to Animals: Views in Animal Welfare.* Cambridge University Press: Cambridge, UK. <https://doi.org/10.1017/CBO9780511608476>
- Food and Agriculture Organisation** 2016 *FAOSTAT.* <http://faostat.fao.org>
- Grimm P** 2010 Social desirability bias. In: Sheth JN and Malhotra N (eds) *Encyclopedia of Marketing.* Wiley International: New Jersey, USA. <https://doi.org/10.1002/9781444316568.wiem02057>

- Halal Food Authority** 2016 *Losing our religion? Two thirds of people still claim to be religious*. <http://halalfoodauthority.com/definition-of-halal/>
- Harzing AW** 2006 Response styles in cross-national survey research: A 26-country study. *International Journal of Cross Cultural Management* 6: 243-266. <https://doi.org/10.1177/1470595806066332>
- Hemsworth PH** 2003 Human-animal interactions in livestock production. *Applied Animal Behaviour Science* 81(3): 185-198. [https://doi.org/10.1016/S0168-1591\(02\)00280-0](https://doi.org/10.1016/S0168-1591(02)00280-0)
- Hofstede G** 2011 Dimensionalizing cultures: The Hofstede Model in context. *Online Readings in Psychology and Culture*. <http://scholarworks.gvsu.edu/cgi/viewcontent.cgi?article=1014&context=orpc>
- Lapiz SMD, Miranda MEG, Garcia RG, Daguro LI, Paman MD, Madrinan FP and Briggs DJ** 2012 Implementation of an intersectoral program to eliminate human and canine rabies: the Bohol Rabies Prevention and Elimination Project. *PLoS* 6(12): e1891. <https://doi.org/10.1371/journal.pntd.0001891>
- Ling RZ, Zulkifli I, Lampang PN, Nhiem DV, Wang Y and Phillips CJC** 2016 Attitudes of students from southeast and east Asian countries to slaughter and transport of livestock. *Animal Welfare* 25: 377-387. <https://doi.org/10.7120/09627286.25.3.377>
- Lowé ACT and Corkindale DR** 1998 Differences in 'cultural values' and their effects on responses to marketing stimuli: A cross-cultural study between Australians and Chinese from the People's Republic of China. *European Journal of Marketing* 32: 843-867. <https://doi.org/10.1108/03090569810232291>
- Marciano P** 2010 *Carrots and Sticks Don't Work: Build a Culture of Employee Engagement with the Principles of Respect*. McGraw Hill Professional: New York, USA
- Mellor DJ** 2016 Updating animal welfare thinking: moving beyond the 'Five Freedoms' towards 'A Life Worth Living'. *Animals* 6: 21. <https://doi.org/10.3390/ani6030021>
- Minkov M and Hofstede G** 2012 Is national culture a meaningful concept? Cultural values delineate homogenous national clusters of in-country regions. *Cross-Cultural Research* 46: 133-159. <https://doi.org/10.1177/1069397111427262>
- Napolitano F, Pacelli C, Girolami A and Braghieri A** 2008 Effect of information about animal welfare on consumer willingness to pay for yoghurt. *Journal of Dairy Science* 91(3): 910-917. <https://doi.org/10.3168/jds.2007-0709>
- Nocella G, Hubbard L and Scarpa R** 2010. Farm animal welfare, consumer willingness to pay, and trust: Results of a cross-national survey. *Applied Economic Perspectives and Policy* 32(2): 275-297
- Office International des Epizooties (OIE)** 2011 *Terrestrial Animal Health Code, 20th Edition*. OIE: Paris, France
- PEW Research Centre** 2016 *Muslim population*. <http://www.pewforum.org/interactives/muslim-population-graphic/#/Malaysia>
- Phillips CJC, Izmirli S, Aldavood SJ, Alonso M, Choe BI, Hanlon A, Handziska A, Illmann G, Keeling L, Kennedy M and Lee GH** 2012 Students' attitudes to animal welfare and rights in Europe and Asia. *Animal Welfare* 21: 87-100. <https://doi.org/10.7120/096272812799129466>
- Rollin BE** 1995 *Farm Animal Welfare: Social, Bioethical, and Research Issues*. Wiley International: New Jersey, USA
- Rynes SL, Gerhart B and Minette KA** 2004 The importance of pay in employee motivation: Discrepancies between what people say and what they do. *Human Resources Management* 43: 381-394. <https://doi.org/10.1002/hrm.20031>
- Schwartzkopf-Genswein KS, Faucitano L, Dadgar S, Shand P, González LA and Crowe TG** 2012 Road transport of cattle, swine and poultry in North America and its impact on animal welfare, carcass and meat quality: A review. *Meat Science* 92: 227-243. <https://doi.org/10.1016/j.meatsci.2012.04.010>
- Serpell JA** 2004 Factors influencing human attitudes to animals and their welfare. *Animal Welfare* 13: 145-151
- Sinclair M, Zito S and Phillips CJ** 2017 The impact of stakeholders' roles within the livestock industry on their attitudes to livestock welfare in south east and east Asia. *Animals* 7(2): 6. <https://doi.org/10.3390/ani7020006>
- Tiplady C, Walsh DB and Phillips CJC** 2012 Cruelty to Australian cattle in Indonesian abattoirs: How the public responded to media coverage. *Journal of Agricultural and Environmental Ethics* 26: 869-885. <https://doi.org/10.1007/s10806-012-9412-0>
- Verbeke W, Pérez-Cueto FJ, de Barcellos MD, Krystallis A and Grunert KG** 2010 European citizen and consumer attitudes and preferences regarding beef and pork. *Meat Science* 28: 284-292. <https://doi.org/10.1016/j.meatsci.2009.05.001>
- UN Human Development Index (UNHDI)** 2015 *Human Development Data*. <http://hdr.undp.org/en/data>
- Veissier I, Butterworth A, Bock B and Roe E** 2008 European approaches to ensure good animal welfare. *Applied Animal Behavior Science* 113: 279-297. <https://doi.org/10.1016/j.applanim.2008.01.008>
- Verrinder J** 2016 *Identifying and developing capacity for veterinarians to address animal ethics issues*. PhD Thesis, Faculty of Science, University of Queensland, Australia
- Wildlife SOS** 2009 *Dancing bears in India – final curtain*. 2009. <http://wildlifesos.org/dancing-bears-in-india-final-curtain/>
- Win-Gallup** 2012 *Global index of religiosity and atheism*. <http://www.wingia.com/web/files/news/14/file/14.pdf>
- World Animal Protection** 2016 *World animal protection index*. <http://api.worldanimalprotection.org/#>
- World Bank** 2016 *Agriculture and rural development*. <http://data.worldbank.org/topic/agriculture-and-rural-development>