



Australian Government
Department of Agriculture



**Development of a Public Attitude
Monitoring Scheme:
Monitoring public attitudes to inform animal welfare
policy development**

Final Report
APL Project number 2012/0026
Department of Agriculture Project number AW1213-17
April 2014

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Acknowledgements

We would like to express our gratitude to Allan Sheridan, Michelle Edge, Jane Littlejohn and Pat Mitchell for assisting us with the development of the questionnaire for this project.

This project was funded by the Department of Agriculture, Australian Pork Limited, and the Australian Meat Processor Corporation.

Executive summary

The goal of this project is to explore and monitor attitudes towards the livestock industry and industry practices, knowledge of livestock practices and the potential existence of opinion leaders.

A total of 479 participants (228 males, 251 females) were selected from all states within Australia. All participants were interviewed by telephone.

The questionnaire took 30 minutes to complete by telephone and consisted of 142 items. These items covered a number of areas. Areas covered were: demographics, questions about animal welfare, knowledge of livestock animals and livestock animal welfare, attitudes towards livestock practices, attitudes towards the livestock industries' impact on the environment and towards specific livestock industry procedures and practices and whether or not they have engaged in behaviours to express their dissatisfaction with the Australian livestock industries, the frequency with which they access or distribute livestock animal welfare information and the extent to which they trust various sources of livestock animal welfare information.

The majority of respondents (60%) expressed positive attitudes towards livestock animal welfare and most respondents also hold positive attitudes towards eating meat, which is reflected by the high meat consumption patterns. Attitudes towards eating meat correlated with reported frequency of eating meat. The relationships between attitudes and meat consumption were much stronger than previously reported. This finding suggests that community attitudes are beginning to become more relevant to meat consumption. However, differences in the specific attitudes measured between surveys may also account for the variation in findings across studies.

While most respondents demonstrated their understanding of procedures such as hot iron branding and free range chicken, few respondents correctly identified procedures relating to slaughter including Halal and Kosher meat production practices and pre-slaughter stunning. This lack of knowledge may reflect deliberate avoidance of the topic or some form of misinformation. Crutching and mulesing were also commonly confused.

The correlation between perceived and actual knowledge was significant but weak ($r=0.15$). Together these results indicate that the community is not well informed about the procedures involved in livestock farming. Public education programs addressing this lack of information are therefore required.

The most trusted sources of information were product labels and information received from friends and family. Animal welfare websites were also well trusted. Of those that visited animal welfare websites, the most common site nominated was the RSPCA.

Generally speaking, most people have some level of trust in livestock workers to properly care for their animals. However, a significant proportion of respondents reported low levels of trust in sea transport workers, land transport workers and abattoir workers.

Three quarters of the sample engaged in at least one of the 13 community behaviours to express their dissatisfaction with the way livestock animals are treated. Speaking to colleagues, family members, or friends and donating money to an animal welfare or animal rights group were the most frequent behaviours.

Females, respondents with higher levels of education and members of animal welfare or rights groups were more likely to engage in community behaviours. Most of the attitude variables correlated with community behaviour. Actual knowledge was not correlated with community behaviours but perceived knowledge was. Together demographics, attitudes, and trust variables accounted for 46% of the variation in community behaviours.

It was possible to identify a group of people who reported being used as a source of animal welfare information by those around them. Opinion leaders were younger than non-leaders and held less positive attitudes, and lower trust, towards the livestock industries.

Perceived knowledge, but not actual knowledge or experience in living in farms, differed between self-nominated leaders and non-leaders, with leaders perceiving their knowledge to be greater than non-leaders.

Recommendations

Given the differences between the findings observed here and previous work in this field, it is recommended that the survey be repeated on a regular basis to track changes in community attitudes and behaviour.

The mismatch between perceived and actual knowledge of livestock practices needs to be addressed. Public education programs should be developed to improve community knowledge, following which it would be worthwhile to determine the impact on community attitudes and behaviour. The results of this study suggest that there is a high level of mistrust of the capacity of off-farm animal workers, such as those involved in animal transportation, to care for their animals properly. Further research of the kind undertaken by Hemsworth and Coleman (2011) on-farm but that focuses on stockpeople working in land or sea transport is needed. The findings from such work can be used to guide the development of interventions and monitoring processes required.

Given the important role that the RSPCA appears to have as a source of information, a means of engaging the organisation as well as other animal welfare organisations in ongoing discussions of welfare issues needs to be established, particularly given the demise of the AAWS.

The characteristics and role of opinion leaders need to be investigated further. If forums such as AAWS are not available to communicate directly with at least some opinion leaders, an alternative strategy may need to be developed.

Attitudes are important determinants of consumer and community behaviours and may or may not be informed by actual knowledge of livestock practices. Our results show that opinion leaders have lower trust, and hold a less positive view, of the livestock industries. Moreover, opinion leaders are no better informed about livestock practices than non-leaders, but perceive their knowledge to be greater. Transparent, timely and reciprocal communication between the livestock industries and the community offers an opportunity to ensure that community attitudes and behaviours are well-informed and that community expectations are being met. Presently, limited community knowledge regarding livestock practices, particularly in self-nominated opinion leaders, leaves the industry vulnerable to uninformed, community-led pressure for regulatory change in livestock practices. Ongoing monitoring of community attitudes, knowledge and behaviours are therefore important to monitor to enable the livestock industries to respond appropriately to community expectations.

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I. Background

There is growing public concern for animal welfare. This concern is documented in reports from many industrialised nations including Sweden, Spain, Finland and Australia (European Commission, 2007; Gracia, 2013; Parbery & Wilkinson, 2012; Phillips et al., 2012; Prickett, Norwood, & Lusk, 2010; Southwell, Bessey, & Barker, 2006; Vanhonacker, Verbeke, Van Poucke, & Tuytens, 2008). In Australia, reports indicate that 54% of Australians consider animal welfare and cruelty to animals to be an important issue (Roy Morgan Research, 2000). Much of the concern about animal welfare is centred on livestock animals and this is reflected in changing consumer behaviours. Many consumers report thinking about animal welfare when they purchase meat and meat products (Department for Environment Food and Rural Affairs, 2011; European Commission, 2005, 2007). Consistent with this awareness, there has been increasing demand for 'animal welfare friendly' products including organic and free range foods (Blokhuys, Veissier, Jones, & Miele, 2013; Southwell et al., 2006). For example, in Australia, the sale of free range eggs increased from 20% in 2007 to 34% in 2011 (retrieved 20 August 2013 from www.aecl.org). In many countries there is a reduction in meat consumption. This decline has been reported in the United States (Nunes, 2013), United Kingdom (Department for Environment, Food and Rural Affairs, 2012), Finland (Vinnari, Mustonen, & Räsänen, 2010), Germany, Netherlands and Hungary (Kanerva, 2013). Vegetarianism is also becoming increasingly popular in several countries (Allen & Baines, 2002; Lea & Worsley, 2001; Povey, Wellens, & Conner, 2001). Although these changes reflect environmental and health concerns, concern for livestock animal welfare is also a significant contributing factor (Department for Environment Food and Rural Affairs, 2011; European Commission, 2005, 2007; Holm & Mohl, 2000).

Increasing concern for the welfare of livestock animals is also reflected in community behaviours in opposition to the livestock industry. These behaviours are distinct from lobbying behaviour which involves deliberate and repetitive campaigning of politicians and regulatory bodies for change (Coleman & Toukhsati, 2006). According to Coleman and Toukhsati (2006, p.21) "community behaviour is less deliberate and involves taking advantage of situational opportunities to express an attitude through action". These behaviours include actions such as signing a petition, donating money to an animal welfare organisation, participating in rallies and speaking with acquaintances/friends/family about an issue. With the increasing popularity of social media, community behaviours in opposition to the livestock animal welfare industry may also take the form of posting videos or writing blogs. Coleman and Toukhsati (2006) found the prevalence of community behaviours to be quite high. They surveyed 1061 Australians at supermarkets and by telephone and found that 56% of respondents reported that they had engaged in at least one activity in opposition to livestock farming. The frequency with which community members engaged in online activities in opposition to livestock farming was not however investigated.

These behaviours and the public opinions driving them can have a considerable influence on how Governments either react to publicised 'animal welfare events' or regulate contentious management practices in industry. This is especially the case when concerns are expressed by non-governmental animal welfare or rights organisations. The 'Save Babe' campaign is one such example where community pressure, harnessed by animal welfare/rights organisations has led to industry changes. In 2006, Animals Australia, a federation of animal welfare groups in Australia, launched the 'Save Babe' campaign to agitate against and raise public awareness about the containment of sows in farrowing crates (Animals Australia, n.d.). This campaign and the community pressure that followed, led directly to industry changes whereby the revised Australian Code of Practice has included changes to the duration that gestating sows can be housed in stalls. Further to this, Coles, a major chain of supermarkets recently announced that Coles

brand fresh pork products will come from sow stall free farms. This practice will soon be extended to all pork products including bacon and ham (Coles, n.d.).

Not only do community concerns and behaviours impact on how governments react to animal welfare events but they also impact more broadly on the livestock industry's social licence to practice. Animal welfare issues together with issues relating to climate change, water scarcity, and declining biodiversity all threaten farmer's social license to farm. Social licence to farm is defined by Martin and Shepherd as "...the latitude that society allows to its citizens to exploit resources for their private purposes" (2011, p. 4). Social license is granted when industries behave in a manner that is consistent, not just with their legal obligations but also with community expectations (Arnot, 2009; Gunningham, Kagan, & Thornton, 2004; Williams, Gill, & Ponsford, 2007). 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 (Arnot, 2009). According to Martin and Shepherd (2011), working with the community, understanding their opinions towards important issues like animal welfare and the environment and in a manner indicative of cooperation rather than working against them in a defensive manner, is the most successful means to addressing threats to social licence. In this light, exploring public opinions towards the livestock animal industry is an important first step to engaging with the community.

Given threats to social license, exploring the animal welfare concerns of the community is important for the livestock industry to be sustainable. Public opinions change over time. Livestock animal welfare issues thought to be particularly salient at one point in time can be superseded by another animal welfare issue at another point in time. For example, according to the Roy Morgan survey, only 3% of Australians disapproved of mulesing in 2000 (Roy Morgan Research, 2000). By 2006 this percentage grew to 39% (Coleman & Toukhsati, 2006). Responses by government in the form of changes to regulations, industry responses and media exposure are likely factors underlying these changes in opinion. It is therefore important to not only measure current concerns of the community but to monitor changes in opinion over time. Knowledge of public perceptions towards the livestock industry and livestock animal welfare can be used to inform the industry of possible changes in practice throughout the supply chain and provide a basis for educating the public where this is desirable. This knowledge will also allow industry and government to align their policies with consumer and community perceptions.

2. What should be measured in a public perception monitoring scheme?

2.1 Attitudes

Attitudes are one of the most important factors to include in a monitoring scheme because they are one of the prime determinants of volitional human behaviours (Ajzen, 1991). Attitudes are reflective of a positive or negative evaluation concerning a given behaviour or object and are derived from beliefs (Ajzen, 1991; Eagly & Chaiken, 1993). Generally speaking, a person who believes that 'eating meat is healthy' and that 'eating meat is good' would be considered to have a positive attitude towards meat. A person who holds a positive attitude towards eating meat would most likely be a meat eater. In contrast a person who believes 'eating meat is unhealthy' and that 'eating meat is bad', holds a negative attitude towards meat and is unlikely to eat meat.

Past studies indicate that attitudes play a role in influencing a variety of consumer and community behaviours related to the livestock industry. With reference to consumer behaviours, Gracia (2013) analysed intentions to purchase 'animal welfare friendly' meat products and found several beliefs significantly predicted these intentions. The belief that 'animal friendly products' are 'healthier' and are of better quality were related to stronger intentions to purchase 'animal welfare friendly' meats. Similar beliefs were found to underlie intentions to purchase 'animal welfare friendly' chicken and eggs. Similarly, a survey of 3123 UK consumers found that beliefs underlying the purchase of animal welfare friendly chicken and eggs were the belief that purchasing these products were associated with the humane treatment of animals, the belief that these products were associated with improved taste, that purchasing these products made them feel good about themselves, and the belief that there is no difference in price between 'animal welfare' friendly products and other animal products. Interestingly, beliefs about price was also noted as a barrier to buying welfare friendly chicken and eggs as was the belief that there is no difference in taste (Department for Environment Food and Rural Affairs, 2011).

Despite the relationship between attitudes and intentions, concern for livestock animal welfare does not predict actual food purchases very well. Coleman et al. (2005) examined consumer behaviours relevant to pork production. They surveyed 1061 consumers on their opinions of purchasing meat products. Of these, 249 were also interviewed at the point-of-sale of their pork purchases, giving the researchers a direct measure of consumer behaviour. Consumers were asked to rate the importance of 13 traditional aspects of pork such as quality, shelf life, appearance, and humane treatment. They were also asked about their beliefs and attitudes towards pigs and their welfare as well as general animal welfare and farming industry knowledge and attitudes. Humane treatment ranked fifth behind Quality, Produced in Australia, Appearance, and Shelf Life. Overall, the researchers found that attitudes, in combination with demographic variables, accounted for only 8% of the variance in self-reported pork consumption and 11% of the variance in actual pork purchases.

These findings have been replicated elsewhere. Using a similar design, Coleman and Toukhsati (2006) surveyed 516 respondents about their perceptions towards farm animal welfare and meat purchases. Of these 516 respondents, 116 respondents were interviewed at the point-of-sale. Attitudes, in combination with demographic variables, predicted 13.3% of the variance in self-reported lamb purchases, but did not significantly predict point of sale lamb purchases. Attitudes, in combination with demographic variables, predicted 9% of the variance in self-reported beef purchases and only 3% of point-of-sale beef purchases. These results indicate that although welfare is moderately important, factors other than concern for animal welfare are more predictive of pork, beef and lamb purchases. Taken together, the available data

indicate that animal welfare attitudes play a moderate role in predicting some consumer behaviours. This is perhaps not surprising considering that a host of other factors influence purchasing behaviours. Normative beliefs (beliefs about what important others think one should purchase), beliefs relating to consumers' perceived ability to control their purchasing behaviour (such as affordability), and competing attributes of food, such as taste and freshness, all influence food choices (Gracia, 2013).

Despite the weak role animal welfare attitudes play in consumer behaviour, animal welfare attitudes are strongly related to community behaviours in opposition to the livestock industry. Coleman and Toukhsati (2006) found that animal welfare attitudes predicted 29% of the variance in self-reported community behaviours. Positive attitudes towards animal activism were related to greater levels of engagement in behaviours in opposition to farm animal industries. On the other hand, beliefs indicative of opposition to animal activism were related to a lower likelihood of engaging in community behaviours in opposition to livestock farming. Importance of meeting health needs of livestock animals, attitudes towards animals as a source of food and beliefs about cholesterol in meat were also significant predictors of community behaviours (Coleman & Toukhsati, 2006). In another study Coleman, Hay and Toukhsati (2005) found that general attitudes accounted for 22% and 23% of the variance in self-reported community behaviours in the pork and egg samples respectively. Beliefs relating to higher levels of engagement in community behaviours included beliefs about the importance of promoting animal welfare, concerns about free range methods of production and the belief that pork is high in cholesterol. The belief that meat is healthy, that 'activists should not be involved' were related to a reduced likelihood of engaging in community behaviours (Coleman, Hay, & Toukhsati, 2005).

Since attitudes play a role in determining a variety of consumer and community behaviours they are important to monitor. In particular, specific attitudes towards eating meat and participating in community behaviours as well as general attitudes towards livestock animal welfare should be monitored. General attitudes do not predict consumer behaviours as well as behaviourally specific attitudes but they are still important to monitor because general attitudes often influence government and industry responses. For example, many Europeans rate the welfare of laying hens quite poorly and are willing to pay more for eggs that are produced in an 'animal welfare' friendly manner (European Commission, 2007). These attitudes played a major role in the eventual ban of cage laid eggs (Appleby, 2003).

Attitudes towards the environment may also play a role in determining consumer and community behaviours affecting the livestock industry. Public opinion studies indicate that a significant proportion of the community believe that agriculture, including animal agriculture, is responsible for environmental damage and climate change (Bostrom et al., 2012; de Boer, Schösler, & Boersema, 2013; European Commission, 2010). Using an online panel of 1083 consumers in the Netherlands de Boer et al. (2013, p. 4) found that 23% agreed that "agriculture and animal husbandry together are major causes of climate change". On a broader scale, a recent poll conducted by the European Commission revealed that 29% of the European public agree that agriculture is a major cause of climate change (2010). Little is known about the attitudes of Australians towards these environmental issues. The extent to which concern for the environment prompts community behaviours in opposition to the livestock industries is also not known. Some evidence suggests that environmental concerns are one of the drivers for pursuing vegetarian and semi-vegetarian diets (Worsley & Skrzypiec, 1997) but whether or not these environmental concerns drive additional behaviours is not known.

2.2 Demographics

Any tool designed to monitor public attitudes must also monitor antecedents to these attitudes. Demographic variables including, gender, place of residence, age, pet ownership, income and education levels have been found to influence attitudes towards animals.

2.2.1 Gender

Females are consistently found to have more positive attitudes towards animals than males. This difference is documented in children, adolescents and adults in a number of countries (Binngie, er, Wilhelm, & Randler, 2013; Driscoll, 1992; European Commission, 2005; Herzog, Betchart, & Pittman, 1991; Kellert, 1985a; Kellert & Westervelt, 1984; Kendall, Lobao, & Sharp, 2006; Plous, 1991; Signal & Taylor, 2006).

Females are also more likely to be engaged in behaviours reflective of a greater concern for livestock animal welfare. Females are more likely to think about animal welfare when purchasing meat (European Commission, 2005; Prickett et al., 2010) and as a consequence are more likely to purchase 'animal welfare friendly' products compared to males (Department for Environment Food and Rural Affairs, 2011; European Commission, 2005). Females are also engaged in significantly more community behaviours against the livestock industry than males (Coleman & Toukhsati, 2006). For example they are more likely to sign a petition to promote livestock animal welfare.

It is not known whether this gender difference is apparent in levels of perceived or actual knowledge of the livestock industry or whether females' greater levels of involvement in the promotion of animal welfare means that they are more likely to be opinion leaders in this issue. Future research is required to determine whether this is in fact the case.

2.2.2 Place of residence

There are some conflicting findings as to whether or not place of residence influences attitudes to animals. Boogaard, Oosting, and Bock (2006) analysed the views of people living in the Netherlands and found that respondents living in urban areas value human life above animal life less strongly than respondents living in less urbanised areas. Further to this, respondents living in non-urbanised areas perceived the quality of life of farm animals more positively than respondents living in highly urbanised areas. Gracia (2013) on the other hand, found no difference in concern for animal welfare between urban and rural respondents. A large survey of residents of the European Union also found that there was no difference in the level of importance assigned to animal welfare among rural and urban respondents (European Commission, 2007).

One explanation for these conflicting findings is that they don't take childhood experiences into account. Kendall et al. (2006) suggests that childhood experiences can have a lasting effect on attitudes towards farm animals throughout the lifespan. Kendall et al found that people who grew up in non-rural and non-farm settings express greater concern for animal wellbeing than those who grew up in non-urban and farm settings and that this difference persisted despite where these people currently live.

Another explanation for these conflicting findings is that they do not take into account exposure to animals. It is assumed that people who live in urban areas may have a greater level of exposure to animals than people living in rural areas but this may not necessarily be the case. People living in urban areas may visit farms that rear animals frequently. A large survey of citizens in the European Union found that visits

to farms, regardless of where respondents live increased the awareness and concern for animal welfare (European Commission, 2005). Exposure to animals should therefore also be examined in a public perceptions monitoring scheme.

2.2.3 Age

Age is another demographic variable likely to influence attitudes and behaviours in relation to the animal welfare and the livestock industry. Past research in this area has yielded somewhat inconsistent results. A number of public opinion surveys reveal that younger people report more positive attitudes to animals, have greater concern for animal well-being and the way animals are used by humans (Driscoll, 1992; Kendall et al., 2006). Studies investigating consumer attitudes and behaviour however suggest that older people are more likely to think about animal welfare when they purchase meat compared to younger people (Prickett et al., 2010). Consistent with this older people are also more likely to buy animal welfare products compared with younger people (European Commission, 2005; IGD, 2007). Interestingly younger people in the EU were more likely to rate the welfare of dairy cows and pigs raised for meat as poor compared to older people (European Commission, 2005).

Perhaps younger people are more likely to express their concern for animals through community behaviours rather than purchasing behaviours. Consistent with this explanation (Coleman et al., 2005), older people were less likely to and less willing to report engaging in activities in opposition to the egg and pork industry with increasing age. More research is needed in this area.

2.2.4 Pet ownership

Studies indicate that pet ownership, namely the ownership of cats and dogs, is linked to more positive attitudes towards animals including livestock animals (Binngie et al., 2013; Boogaard et al., 2006; Driscoll, 1992). Pet owners perceive the welfare of farm animals less positively than non-pet owners (Boogaard et al., 2006) and, accordingly, are more likely to engage in behaviours in opposition to the livestock industry (Coleman et al., 2005). More research is needed to confirm this relationship.

2.2.5 Education and income

Few studies have investigated the relationship between income and education levels on attitudes towards the livestock industry. Available studies suggest that people with lower levels of income and education report a greater concern for animals and the way they are treated (Kendall et al., 2006; Prickett et al., 2010). People with lower levels of income and education are also more likely to think about animal welfare when they purchase meat compared to people with higher levels of education and income (Prickett et al., 2010).

Whether or not this translates into a greater number of purchases for 'animal welfare friendly' products was not determined.

2.3 Knowledge

Knowledge is another important antecedent of attitudes towards livestock animals and the livestock industry. The level of self-reported knowledge towards livestock production is generally low to moderate (Coleman et al., 2005; Coleman & Toukhsati, 2006; Department for Environment Food and Rural Affairs, 2011; European Commission, 2007; IGD, 2007). In a survey of citizens of the European Union, 57% reported that they had little knowledge of farm animal welfare and 28% reported that they knew nothing at all (European Commission, 2007). Similarly in the UK, 34% tended to agree and 7% strongly agreed that

they had a good understanding of the issues surrounding animal welfare in the context of food production. In some cases, people reported that they are 'deliberately ignorant' about aspects such as slaughter, preparation and processing of meat (IGD, 2007).

It is important to make a distinction between 'perceived knowledge' and 'actual knowledge'. Research carried out in the field of consumer behaviour reveals that correlations between perceived knowledge and objectively measured knowledge range between .30 to .60 (Cole, Gaeth, Chakraborty and Levin, 1992; Feick, Park and Mothersbaugh, 1992). People tend to overestimate what they know (Alba and Hutchinson, 2000; Ellen, 1994; Feick et al., 1992). Accordingly, actual knowledge of livestock production is likely to be lower than what is indicated by self-reports. Consistent with this, Coleman and Toukhsati (2006) asked a sample of Australians to correctly identify a set of common husbandry procedures. They found that 60% of respondents correctly identified most procedures. There was however large variability in what respondents could and could not identify. Knowledge of hot iron branding and tail docking was quite high with 96% and 94% of respondents correctly identifying these procedures. Knowledge of induced moulting and curfewing on the other hand were quite low with 28% and 35% of respondents correctly identifying these procedures.

To accurately measure and monitor knowledge of the livestock industry, it will be important to include a measure of factual knowledge. Knowledge of livestock procedures will serve as a good proxy for general knowledge of practices across a range of livestock industries. Clearly, it will not be practical to measure factual knowledge towards all aspects of the livestock industry so a measure of perceived knowledge may also be a necessary inclusion but it should be interpreted keeping in mind its limitation in being an alternative to measuring actual knowledge.

Despite knowledge being an important antecedent to attitudes, the relationship between knowledge and attitudes is actually quite complex. Kellert (1985b) investigated public perceptions towards wolves in the United States and found that general knowledge of animals was related to more positive attitudes towards wolves. Ericsson and Heberlein (2003) on the other hand, found that greater knowledge was associated with more negative attitudes. Ericsson and Heberlein investigated levels of knowledge and attitudes in hunters living in wolf areas, non-hunters living in wolf areas, hunters in non-wolf areas and non-hunters in non-wolf areas. They found that hunters living in wolf areas had the most accurate knowledge of wolves but also the most negative attitudes towards them. What this study shows is that more knowledge doesn't necessarily lead to more positive attitudes. Rather it is the content of the knowledge that is important. If knowledge is reflective of an underlying belief about the positive attributes associated with an attitude object then knowledge will be related to positive attitudes. If, on the other hand, knowledge is reflective of an underlying belief about the negative attributes associated with an attitude object then knowledge will be related to negative attitudes.

Keeping this caveat in mind, there is evidence to suggest that the provision of some livestock animal information can be effective in changing attitudes. Boogaard et al. (2006) investigated the extent to which an information leaflet had an influence on the perceptions of Dutch citizens. A sample of 1074 randomly selected Dutch respondents were asked to complete a questionnaire asking about perceptions of farm animal welfare, using animals for human consumption, and general perceptions towards farmers. Of these 1074 respondents, 842 received an information leaflet in addition to the questionnaire. This leaflet included information of livestock production and farm animal welfare. It also contained information from a scientific perspective, a farmers' perspective and from the perspective of an animal protection organisation. It was found that there was no significant difference between the animal welfare perspectives,

beliefs about using animals for human consumption of those who received the leaflet and those who didn't. Respondents who received the leaflet did however, have a more positive image of farmers than those who didn't receive the leaflet indicating the information may have some, albeit limited impact on attitudes.

Given that attitudes can determine volitional behaviours, this may be an effective means for the industry to educate the public. It is therefore important to understand the degree of knowledge the public has on livestock animals and which facets of knowledge are linked to beliefs and behaviours. Should industry choose to communicate with and inform the public of industry practices it will be instructive to determine which channels of information the public obtain livestock animal welfare information from, the frequency they access this information and level of trust they have in these channels of information.

2.4 Trust

According to Mayer, Davis and Schoorman (1995, p. 712), trust may be defined as “the willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other will perform a particular action important to the truster, irrespective of the ability of the latter to monitor or control such an activity”. Trust in the Australian livestock industries, in addition to attitudes and their antecedents, is important to monitor because it is closely linked to social license to practice. The extent to which an organisation or industry is given a social license to operate largely depends on whether or not the community have trust in the organisation or industry (Arnot, 2009). Food scandals (Premanandh, 2013), disease outbreaks affecting livestock (Jacob & Hellstrom, 2000), Genetically Modified (GM) foods (Ding, Veeman, & Adamowicz, 2012) and media coverage of poor animal handling practices (Bettles, 2013) erode trust in the livestock industries.

Studies that have investigated animal welfare and trust in the livestock industries reveal that levels of trust in various aspects of the livestock industries vary between countries. A study conducted in France, Germany, Italy, Spain and the UK measured trust in those involved in the livestock industry by asking about the likelihood that farmers, specifically those involved in transport, breeding and management of livestock, would comply with a set of animal welfare standards (e.g., adequate space allowance, have attained necessary skills and expertise) (Nocella, Hubbard, & Scarpa, 2010). The results revealed that almost half of the respondents believed that it was unlikely that stakeholders would comply with animal welfare standards. These results indicate that respondents had relatively low levels of trust in the livestock industries in relation to complying with animal welfare standards. In contrast, respondents to a survey conducted in Finland revealed relatively high levels of trust in animal farming practices (Jokinen, Kupsala, & Vinnari, 2012). This variation in trust is perhaps not surprising given each country has its unique cultural background. Livestock practices with countries may also differ widely which may also affect levels of trust. To the knowledge of the authors, little is known about current levels of trust in the Australian livestock industries. It may therefore be instructive to gauge and monitor levels of trust in Australian communities.

2.5 Opinion leadership

It may also be instructive to identify and gauge attitudes and levels of knowledge and trust in opinion leaders. Opinion leaders are important to identify because they tend to lead debate on social issues and provide a conduit for information from various sources to reach their social group. The opinions of these leaders have the power to influence the thoughts and actions of those they communicate with Berkman and Gilson (1986) suggest that information received from opinion leaders is perceived by the public as more credible than information received from the media. As such they are an asset to the promotion of

ideas but can also be responsible for leading active opposition (Chan & Misra, 1990).

Opinion leaders typically have the following characteristics that set them apart from non-leaders: enduring involvement in the issue or product, high levels of perceived knowledge and greater levels of exposure to information (i.e., greater internet usage, great exposure and use of print media) (Chan & Misra, 1990; Lyons & Henderson, 2005; Trepte & Scherer, 2010; Venkatraman, 1990).

Little is known about the existence of opinion leaders in the field of livestock animal welfare. Coleman et al. (2005) found a high correlation between the number of behaviours that people performed in support of the livestock industries and behaviours in opposition to the livestock industries. In other words, people who reported engaging in any kind of community behaviour tended to do so regardless of whether the behaviour was in support of, or in opposition to, various aspects of livestock farming. This suggests that there are some members of the community who actively engage in expressing their views in the various forums that are available to them and are possibly opinion leaders in this field. The possible existence of opinion leaders, their characteristics, extent of knowledge and influence should be explored further.

3. Aims

The goal of this project is to explore and monitor attitudes towards the livestock industry and industry practices, knowledge of livestock practices and the potential existence of opinion leaders. It is anticipated that such information will inform industry communications to the community on current practices in regard to animal welfare and industry responses to community concerns. To achieve these goals, the specific aims of this project were as follows:

1. Determine attitudes towards livestock animal welfare
2. Determine levels of knowledge of livestock practices in the community
3. Explore levels of trust in the livestock industries
4. Investigate the extent to which demographics, attitudes, trust and knowledge are related to community behaviours
5. Identify opinion leaders and their characteristics in terms of demographics, attitudes, levels of trust and behaviours.

4. Method

4.1 Participants

A total of 479 participants (228 males, 251 females) were recruited from all States and Territories of Australia. Participants ranged in age from 19 to 90 ($M = 48.55$, $SD = 17.35$). In order to obtain a representative sample, 449 were recruited randomly via the telephone by I-View, a market research company in Victoria, Australia. Because the younger age groups were under-represented by the telephone survey, an additional 30 interviewees aged between 18 to 34 years were recruited via email sent to registered I-View panel members. All participants were interviewed by telephone.

4.2 Materials

A pilot questionnaire was developed using an iterative process beginning with a literature review and discussions with key industry, government and research representatives. This process generated a large question bank of over 400 items which was reviewed and subsequently reduced to a 200 item draft questionnaire. The draft questionnaire was revised further on the basis of feedback obtained from key relevant personnel as well as feedback obtained from a pilot of 45 telephone interviewees to produce the final questionnaire. The final questionnaire took 30 minutes to complete by telephone and consisted of 142 items divided into five sections (Appendix A).

Section A – Questions about you and your family

This section contains 17 questions probing demographic and dietary information.

Section B – Questions about animal welfare

This section contains 43 questions asking about participants' general attitudes towards animal welfare, attitudes towards using animals and attitudes towards the Australian livestock industries.

Section C – Questions about your knowledge of livestock animals and livestock animal welfare

This section contains 16 questions pertaining to respondents' perceived and actual knowledge of various livestock industries and practices.

Section D – Questions about your attitudes towards livestock practices

This section contains 35 items asking about participants' attitudes towards the livestock industries' impact on the environment and their attitudes towards specific livestock industry procedures and practices.

Section E – Questions about your behaviour in relation to livestock animal welfare

This last section contains 31 questions asking respondents about whether or not they have engaged in behaviours to express their dissatisfaction with the Australian livestock industries, the frequency with which they access or distribute livestock animal welfare information and the extent to which they trust various sources of livestock animal welfare information.

Since there was little variation between the pilot questionnaire and final questionnaire, data obtained from the pilot was combined with the rest of the dataset for subsequent analyses. Comparisons between pilot data and the rest of the data set on attitudes, trust, knowledge, and opinion leadership variables revealed no significant differences thus confirming the decision to combine datasets.

4.3 Procedure

Data collection took place between 3 December 2013 to 18 December 2013. Individuals were contacted by telephone during daytime and early evening hours and asked if they would like to participate in a 30

minute anonymous survey being conducted by The University of Melbourne about knowledge of, and attitudes towards Australian livestock animal welfare and the Australian livestock industries. In order to increase the chances of obtaining a representative sample of all ages, particularly people within the 18-34 age bracket, interviewers asked to speak with the youngest male or female in the household who was over 18 years of age. This procedure was still unable to adequately represent 18 to 34 year olds so an additional 30 interviewees were recruited via invitation emailed to registered I-View panel members.

5. Results

5.1 Demographic characteristics

5.1.1 Age, education, income, living arrangements and religious affiliations

The age distribution of respondents is presented in Table 1. As can be seen in Table 1, most age ranges, with the exception of those aged 61 and over, were equally represented. Older people (61 years old and older) were more highly represented in this sample (26.9%) compared to their proportion of the population as reported by the Australian Bureau of Statistics (2013a). According to the ABS, Australian residents aged 60 years old and over represent 19.79% of the population.

Table 1. Age Distribution of Respondents

Age	Frequency	Percent
18-30	82	17.1
31-40	94	19.6
41-50	84	17.5
51-60	90	18.8
61 and over	129	26.9
Total	479	100.0

Table 2 presents the highest level of education achieved by respondents. Just under half (42.2%) of all respondents had achieved a University or other higher educational institution qualification while a third of respondents (29.6%) had achieved a secondary school education. Just under a quarter of the sample had achieved a technical or further education institution (e.g., TAFE College) qualification. It should be noted here that this sample over represents those with a University education. According to the ABS, 24.6% of persons aged between 15 and 64 years reported having achieved a Bachelor degree or above (ABS, 2013b).

Table 2. Education Distribution of Respondents

Education Level	Frequency	Percent
Primary School	19	4.0
Secondary School	142	29.6
Technical or further educational institution (including TAFE College)	114	23.8
University or other higher educational institution	202	42.2
Other educational institution	2	0.4
Total	479	100.0

Figure 1 presents the weekly household income (from all sources, before taxes) distribution of respondents. Just over one quarter of the sample (25.7%) reported that they did not know their weekly household income or preferred not to say. Of those who reported weekly household income, many respondents reported household weekly incomes between \$1,500 to \$2,499 with very few respondents living on Nil or negative income.

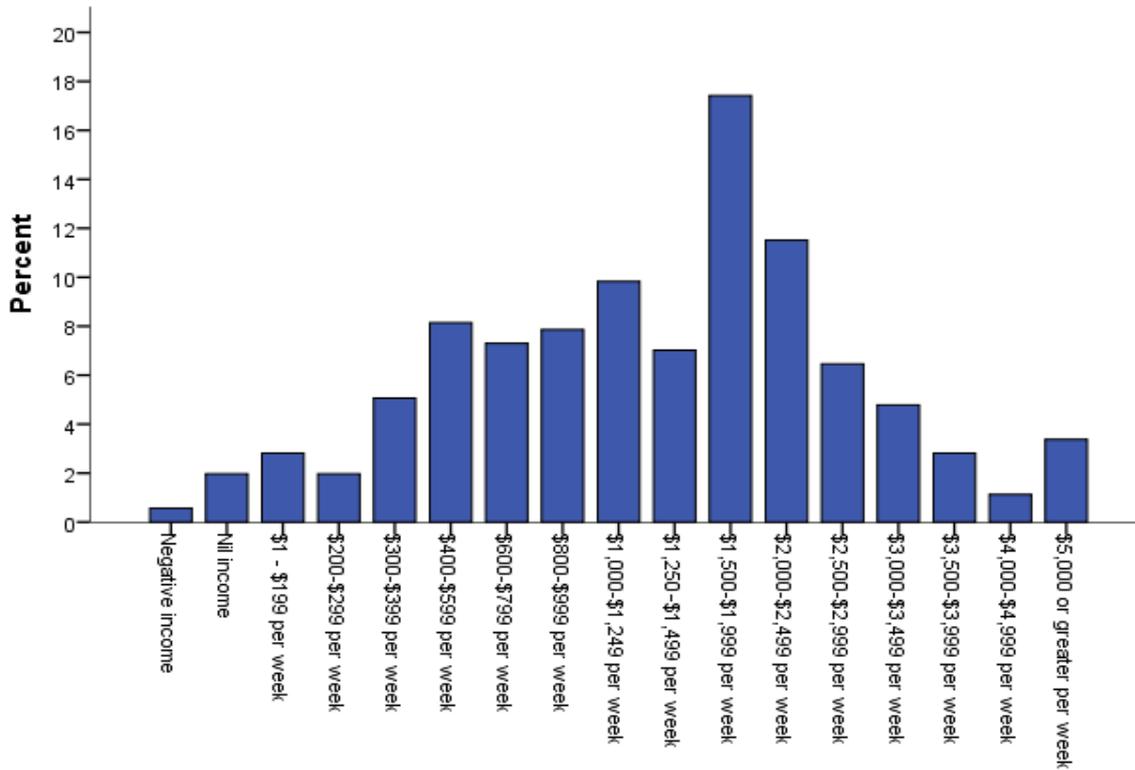


Figure 1. Income distribution of respondents

Figure 2 presents the remoteness distribution of respondents as a function of State or Territory. Remoteness was calculated by cross referencing post codes with Accessibility and Remoteness Index of Australia (ARIA+) classifications. These classifications allow for distinctions to be made between regions based on road distance to service centres (towns) of various sizes (Australian Population and Migration Research Centre, 2014). As can be seen in Figure 2, the vast majority of respondents live in major cities of Australia (68.5%) with very few respondents living in remote and very remote areas. Further to this most respondents live in New South Wales or Victoria (31.9% and 26.1% respectively). Nonetheless these proportions are reflective of those reported by the ABS (Australian Bureau of Statistics, 2012, 2013a).

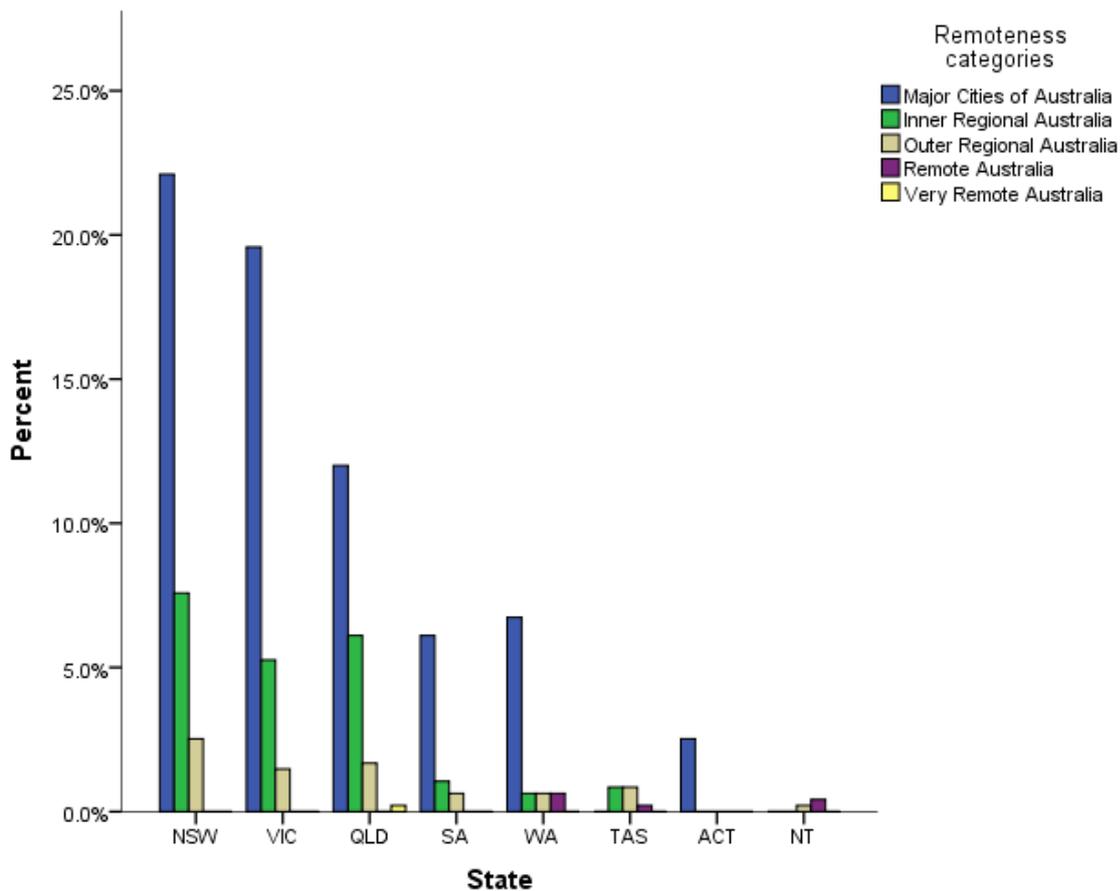


Figure 2. Remoteness as a function of State

Table 3 presents the distribution of religious affiliation of respondents. Nearly half of all respondents reported no religion (47%). Of those respondents that reported a religious affiliation, Christianity was the most common. Twenty percent of respondents reported that they are Catholic and a further 25.7% reported another Christian religion including Anglican, Uniting Church, Presbyterian and Reformed.

Table 3. Distribution of Religious Affiliation

Religious Affiliation	Frequency	Percent
No religion	225	47.0
Non-Christian religion	18	3.8
Catholic	98	20.5
Other Christian	123	25.7
Agnostic	3	.6
Do not wish to say	12	2.5
Total	479	100.0

Table 4 shows the household composition of respondents. Over half of all respondents live with a partner or spouse (63.5%). Living with a dependent child or children is also common (30.9%).

Table 4. Household Composition of Respondents

Category	Frequency	Percent ^a
Partner or spouse	304	63.5
Dependent child or children (including step-children)	148	30.9
Parent(s)	60	2.5
Brother/sister	19	4.0
Unrelated flatmate or co-tenant	18	3.8
Alone	18	3.8
Other	7	1.5

^aCategories are independent so column does not add to 100%

5.1.2 Living with pets and farm animals

Dog ownership was particularly common with 41.8% of respondents reporting to be living with at least one pet dog. Cat ownership was slightly less common with approximately a quarter (26.1%) of respondents reportedly living with at least one pet cat.

Less than a third (30.1%) of respondents reported to have lived or to be currently living on a farm with animals. Of those who have lived or currently live on a farm with animals the most common livestock animals kept on farms were cattle, sheep and poultry. Other animals including horses, alpacas, dogs and ducks were also commonly kept on farms (Table 5).

Table 5. Types of livestock animals kept on Present and Past farms

Livestock	Frequency	Percent of total ^a	Percent of farmers ^a
Beef	78	16.3	54.2
Sheep	66	13.8	45.8
Poultry (eggs)	66	13.8	45.8
Dairy	45	9.4	31.3
Poultry (meat)	42	8.8	29.2
Pig	26	5.4	18.1
Goat	14	2.9	9.7
Other	46	9.6	31.9

^a Categories are independent so columns do not add to 100%

5.1.3 Dietary habits

As shown in Table 6, the majority of respondents are meat and vegetable eaters (91.4%). Very few respondents reported to be vegetarian or vegan.

Table 6. Dietary Habits of Respondents

Food	Frequency	Percent
Meat and vegetable eater	438	91.4
Vegetarian	35	7.3
Vegan	3	0.6
Other	3	0.6
Total	479	100.0

Figure 3 presents the average weekly consumption of animal products. The most frequently eaten animal products are dairy products. The majority of respondents (80.4%) reported eating dairy foods more than 3 times a week. Eggs were also frequently eaten with over a quarter (25.1%) of respondents reporting that they ate eggs more than 3 times a week. Pork and lamb were least frequently eaten with 22.5% and 28.2% of respondents reporting that they never ate these meats.

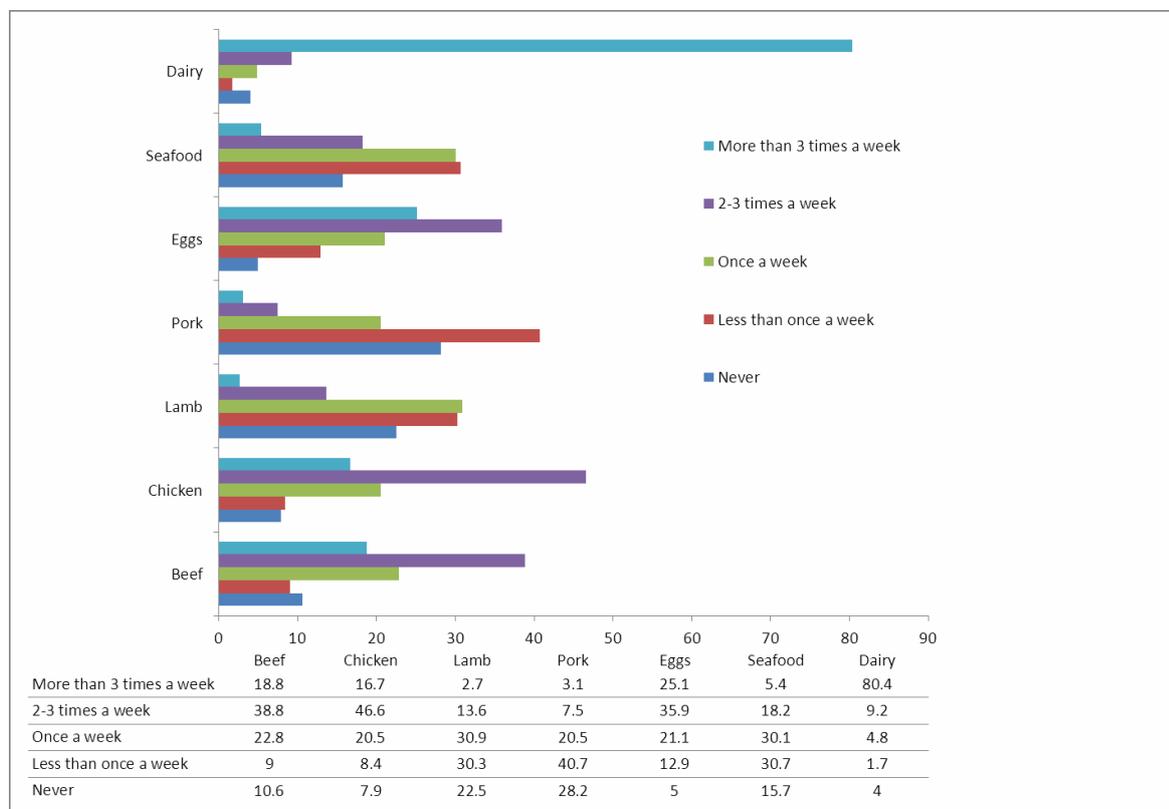


Figure 3. Percentages of weekly consumption of animal products

5.2 Animal welfare perceptions and acceptability of animal uses

Respondents were asked on a scale from 1 to 5 (1 = Does not describe animal welfare at all, 5 = Completely describes animal welfare), the extent to which they thought a series of descriptions of animal welfare captured what animal welfare means to them. Figure 4 presents the mean level of agreement with these various descriptions. As can be seen from Figure 4, with the exception of 'Promoting good food quality' ($M=3.31$, $SD=1.48$), respondents rated all descriptions relatively high with means ranging from 3.88 ($SD= 1.48$) for 'Balancing the needs of animals and people' to 4.59 ($SD=0.92$) 'Preventing animal cruelty'.

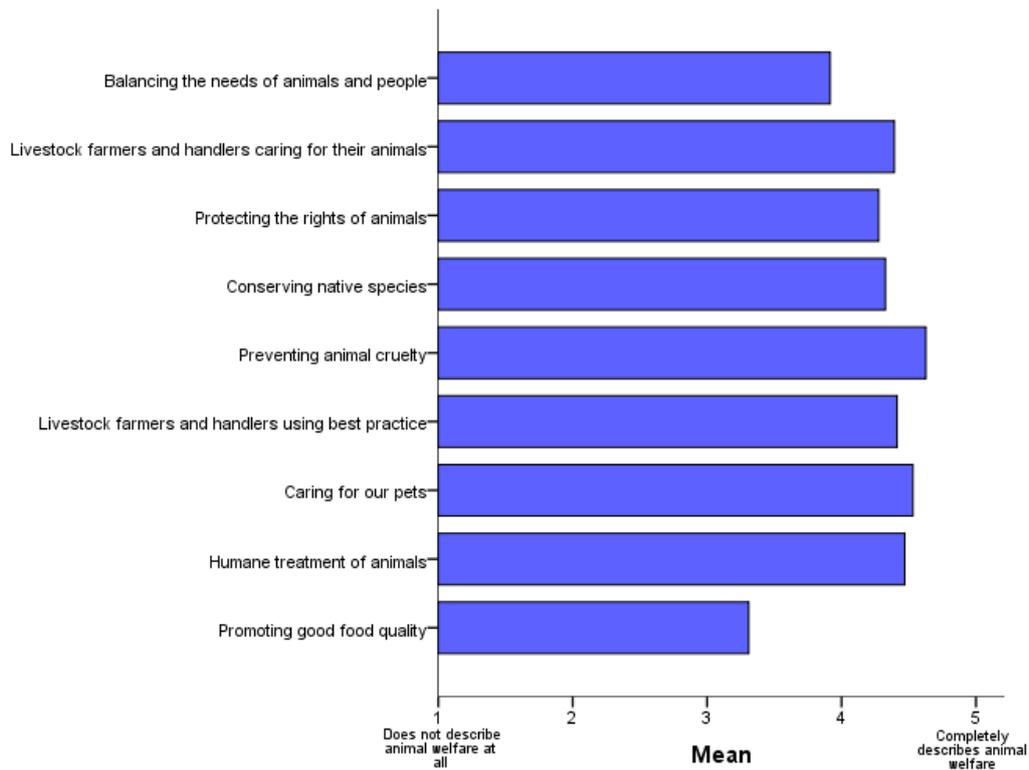


Figure 4. Level of agreement with animal welfare descriptions

Using a 5 point Likert-type scale (1 = Extremely unacceptable and 5 = Extremely acceptable), the level of acceptability of animal uses varied among the list of uses (Table 7). Using animals for the purpose of companionship (pets) was the most acceptable type of animal use while using animals for research or for sport and entertainment were the least acceptable uses. Animals used for the production of food and clothing were the second and third most acceptable uses for animals.

Table 7. Respondents' Level of Acceptability of Animal Uses

Category	Mean	Std Deviation
Companions (pets)	4.68	0.69
Food	4.10	1.11
Clothing	3.18	1.48
Research	2.44	1.30
Sport and entertainment	2.12	1.16

Note. Scale ranged from 1 to 5 (1= extremely unacceptable, 5 = extremely acceptable)

Figure 5 shows perceived welfare of livestock animals. Welfare ratings were measured on a 5- point Likert-type scale (-2 = Very poor, +2 = Very good). As can be seen in Figure 5, laying hens were believed to have the poorest welfare. Dairy cows and sheep produced for wool, on the other hand were perceived as having moderately good welfare.

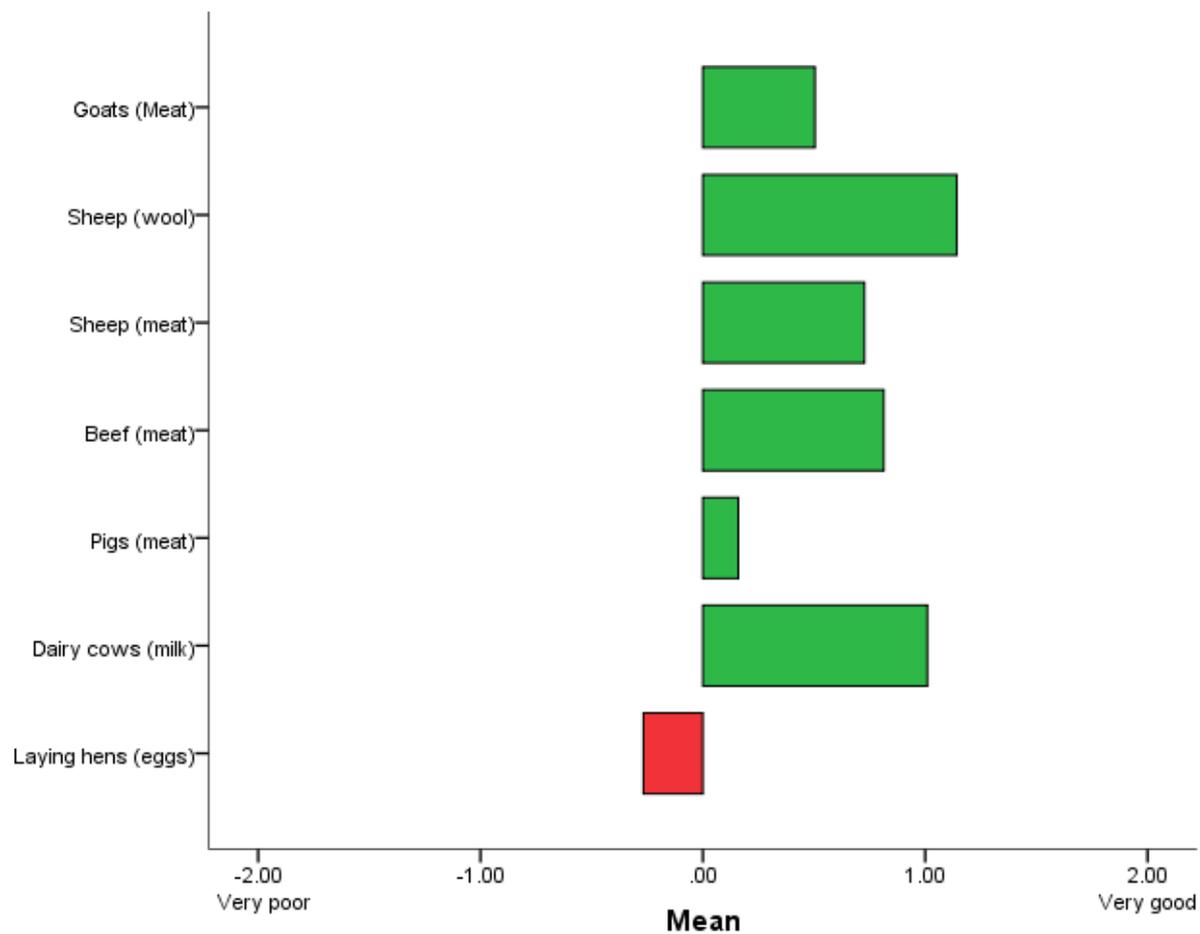


Figure 5. Perceived welfare of livestock animals

5.3 Animal welfare attitudes and trust variables

Attitude and trust questionnaire data were reduced to form scales using Principal Components Analysis (PCA). Before conducting the PCAs, items were recoded where appropriate so that high scores reflected positive attitudes, high trust etc.

Scale reliabilities were measured using Cronbach's α coefficients with an $\alpha \geq 0.70$ as the criterion for acceptable reliability (DeVellis, 2003). Items were included in a scale if their loading on the relevant component exceeded 0.40 (Tabachnick & Fidell, 2012) and if, on the basis of face validity, they could be summarised by just one construct. Varimax or Oblimin rotations were performed on component solutions of more than one factor to provide the best simple structure (Tabachnick & Fidell, 2012).

5.3.1 Attitudes towards livestock animal welfare

This scale loaded on one factor and explained 41.27% of the variance. This scale consisted of six items that reflect the degree to which respondents believe that the welfare of livestock animals is an important consideration to them. The scale includes items such as "livestock animals have the same rights as domestic pets" and "people should do whatever is necessary (legal or illegal) to stop animals is being used in livestock production systems". All items were scored on a 5-point scale (1=Strongly disagree, 5= Strongly agree). High scores on this scale are indicative of positive attitudes towards livestock animal welfare. As can be seen in Figure 6, there is a slight negative skew in the distribution. Upon closer inspection, 60% of respondents scored above the neutral point of 3.0 on the subscale. This indicates that most respondents hold positive attitudes towards livestock animal welfare.

Although all items comprising this subscale loaded on a single factor, responses to "people should do whatever is necessary (legal or illegal) to stop animals being used in livestock production systems" were analysed separately because of the behavioural implications of this item. Although most of the respondents disagreed or neither agreed nor disagreed with the statement (Strongly disagree = 32.3%, Disagree = 20.9%, Neither agree nor disagree = 24.9%), over 20% of respondents strongly agreed or agreed with the statement (Strongly agree = 12.6%, Agree = 9.4%).

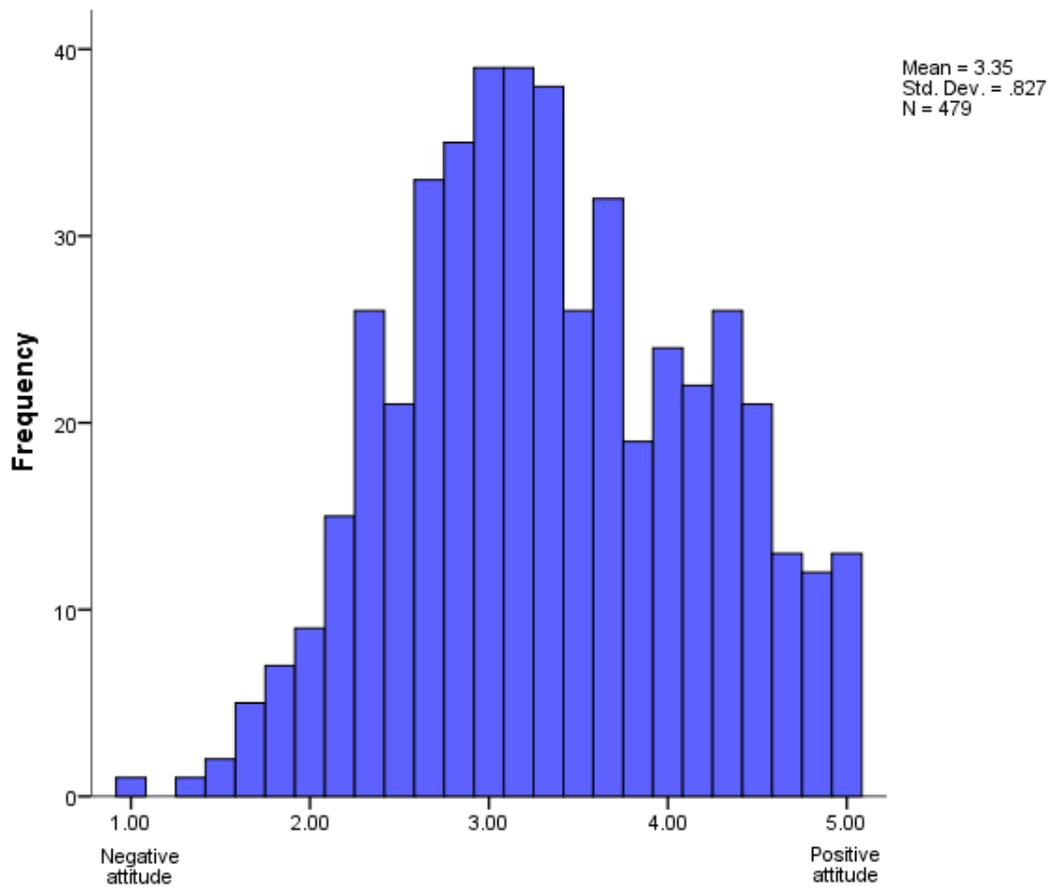


Figure 6. Attitude towards livestock animal welfare (Cronbach's alpha = 0.79)

5.3.2 Attitudes towards animals as a source of food

PCA revealed the presence of two factors explaining 71.07% of the variance in attitudes towards animals as a source of food. The first factor consisted of four items. Three of these items referred to attitudes towards eating meat while the other item referred to prices paid by supermarkets to farmers. On the basis of face validity, this latter item was analysed separately. The second factor contained just one item which referred to positive attitudes towards eating free range food. “Free range foods taste better than intensively farmed foods” ($M=3.55$, $SD=1.31$) and “Australian livestock farmers deserve better prices and purchase conditions from supermarkets” ($M=4.48$, $SD=0.87$) were left as single items. All items were measured on a 5-point scale (1=Strongly disagree, 5=Strongly agree).

Figure 7 presents the distribution of respondents to the 'Attitudes towards eating meat' subscale. 'Attitudes towards eating meat' consisted of three items measuring the extent to which respondents believe a set of positive characteristics about meat as part of a person's diet (for example, "meat is part of a balanced diet"). High scores on this scale indicate positive attitudes towards eating meat. As can be seen in Figure 7, the distribution of responses are negatively skewed with most respondents holding positive attitudes towards eating meat. All three items comprising this subscale had similar distributions.

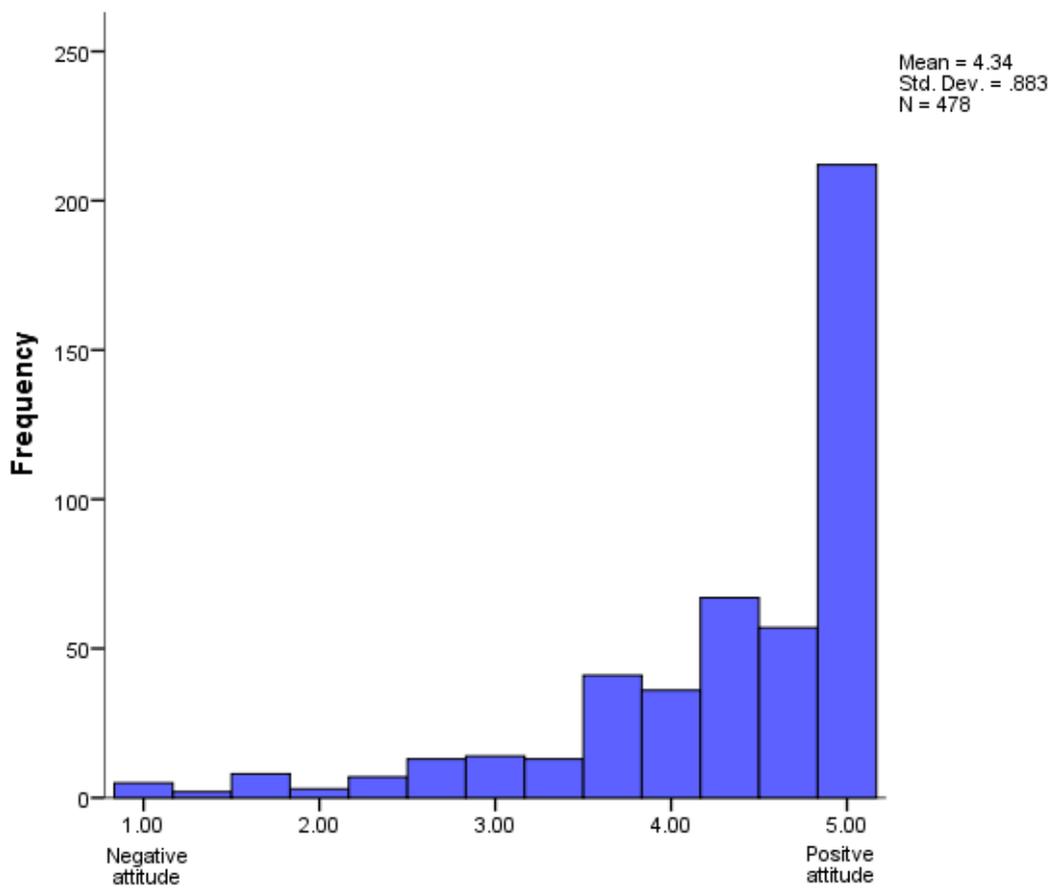


Figure 7. Attitude towards eating meat (Cronbach's alpha=0.85)

5.3.3 *Beliefs about Australian animal welfare standards*

PCA confirmed the existence of one factor explaining 45.69% of the variance, comprising six items, in beliefs that the welfare of livestock animals is promoted and maintained in Australian livestock industries. Example items include, “livestock animal welfare standards in Australian abattoirs are very high” and “live animal exports should continue”. All items were scored on a 5-point scale (1=Strongly disagree, 5= Strongly agree). High scores on this scale indicate beliefs about welfare standards in the Australian livestock industries. As can be seen in Figure 8, respondents were equally divided in their attitudes towards the Australian livestock industries. Upon inspection, it can be seen that 52% of respondents hold negative attitudes with the corresponding 48% holding positive attitudes.

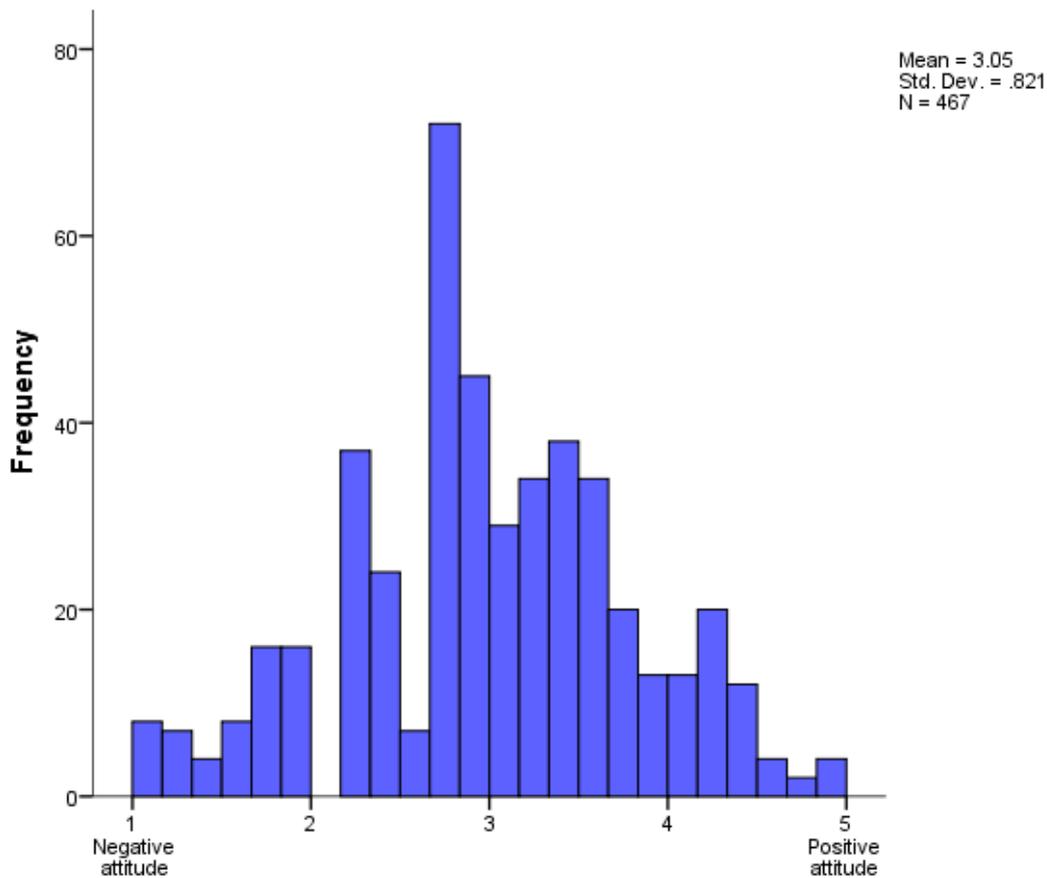


Figure 8. Beliefs about welfare standards in the Australian livestock industries (Cronbach’s alpha=0.74)

5.3.4 *Perceived negative impact of the Australian livestock industries on the environment*

A confirmed the presence of one factor explaining 52.67% of the variance in attitudes towards the impact on the environment of the Australian livestock industries. This subscale consisted of five items measured on a 5-point scale (1= Strongly disagree, 5=Strongly agree) measuring the perceived impact Australian livestock industries have on the environment. Example items included, “fertilisers, pesticides and other farm chemicals are not a threat to the environment if used as directed” and “if left to themselves, most livestock farmers would protect the environment”. High scores on this subscale indicated the belief that the livestock industries have a negative impact on the environment. As can be seen in Figure 9, the

distribution of responses is fairly symmetrically distributed. This indicates that respondents were equally divided on the potential impact the Australian livestock industries have on the environment, although there was a tendency for more to believe that there was a negative impact.

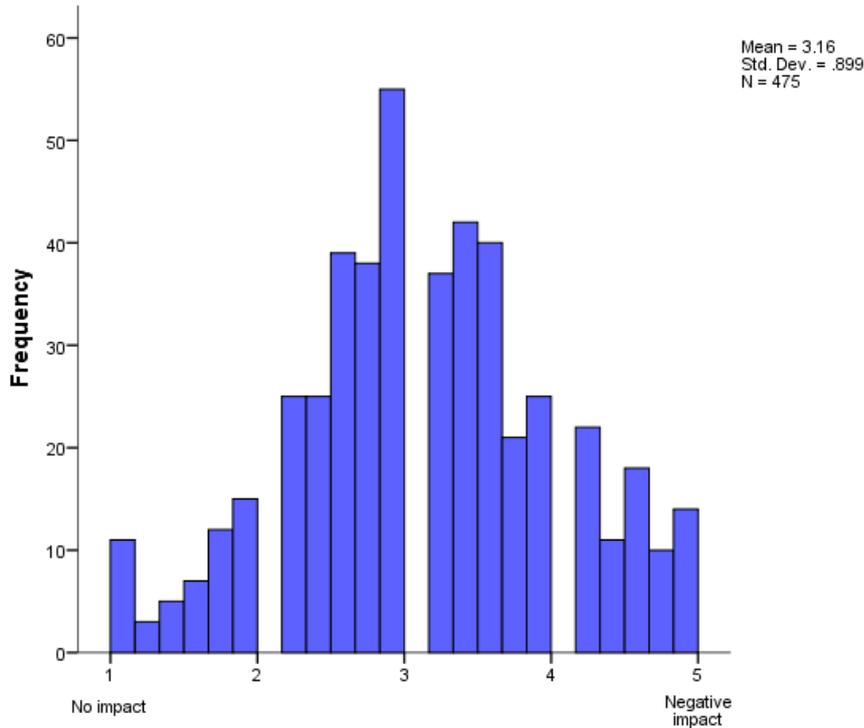


Figure 9. Perceived negative impact of the Australian livestock industries on the environment (Cronbach’s alpha=0.77)

5.3.5 *Trust in the Australian livestock industries*

Level of trust in the Australian livestock industries consisted of five items scored on a 5-point scale (1=Strongly disagree, 5=Strongly agree) measuring the degree to which respondents trust the people involved in the livestock industries to care for livestock animals. Example items include “I trust farmers to properly care for their animals” and “I trust livestock animal handlers to properly care for their animals”. High scores on this scale indicate high levels of trust. PCA identified one factor explaining 72.77% of the variance in trust. As can be seen in Figure 10, there is some variability in the participants’ responses to this scale. Although one third of respondents report low trust, the majority report high trust.

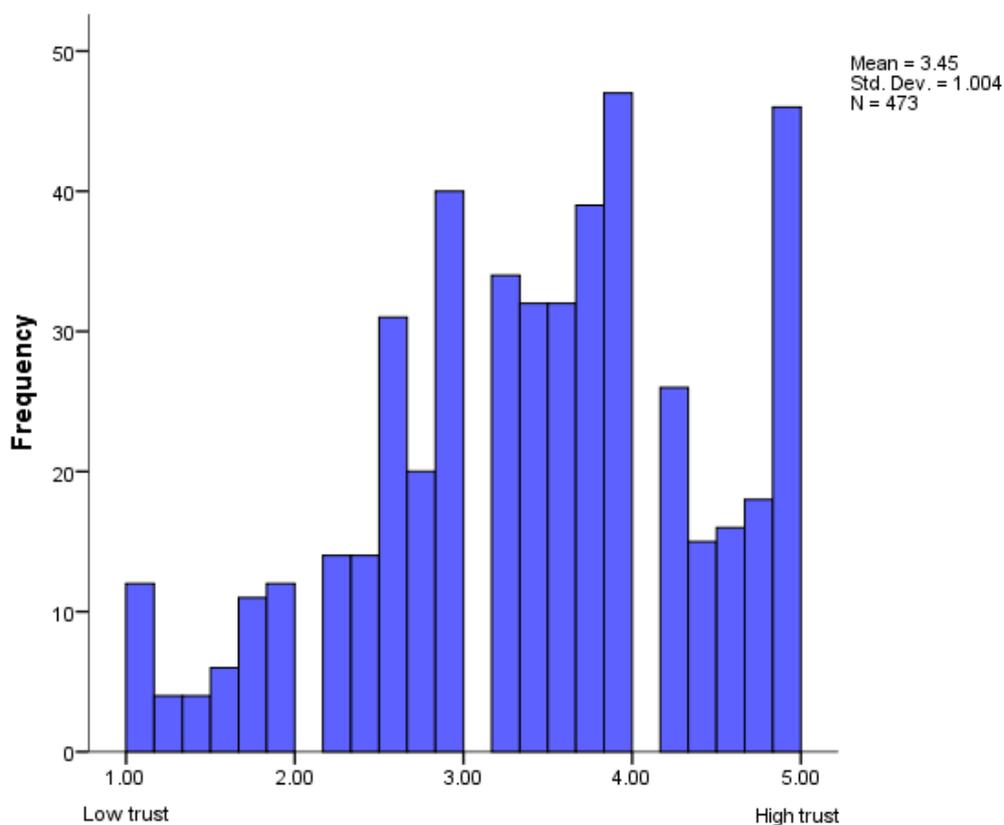


Figure 10. Trust in people involved in the Australian livestock industries (Cronbach's alpha=0.90)

Frequency distributions in the level of trust amongst different people working in the livestock industry are presented in Table 8. As can be seen in Table 8, respondents had the greatest level of trust in farmers to properly care for their animals with 72.1% of respondents reporting high levels of trust in farmers and only 8.4% of respondents reporting low levels of trust in farmers. In contrast, respondents reported the least amount of trust in people responsible for transporting livestock animals by sea. While 36.4% of respondents reported high levels of trust in these people, a further 40.9% reported low levels of trust. Levels of trust were somewhat higher for those transporting animals by land than by sea. Approximately 45% reported high levels of trust in land transporters but just under a quarter of respondents (23.7%) reported low trust. Just under half of all respondents (49.5%) reported high levels of trust in abattoir workers with 23% of respondents reporting low trust in abattoir workers.

Table 8. Distributions of Levels of Trust in People involved in the Australian Livestock Industries

	Low trust		High trust		
Farmers	3.8	4.6	19.5	37.4	34.7
Abattoir workers	8.1	14.9	27.6	28.9	20.6
Animal handlers	5.5	8.3	25.1	38.6	22.5
People transporting livestock animals by sea	18.8	22.1	22.7	20.1	16.3
People transporting livestock animals by land	9.3	14.4	30.7	26.6	19.0

5.3.6 Trust in livestock animal welfare information

Trust in livestock animal welfare information consisted of seven items measured on a 5-point scale (1=No

trust, 5=Complete trust) evaluating levels of trust in various sources of animal welfare information. PCA revealed one factor explaining 42.52% of the variance. As can be seen in Figure 11, respondents were divided in their levels of trust with approximately 47% of respondents scoring below the midpoint of 3. The distribution of levels of trust across the various sources is displayed in Table 9.

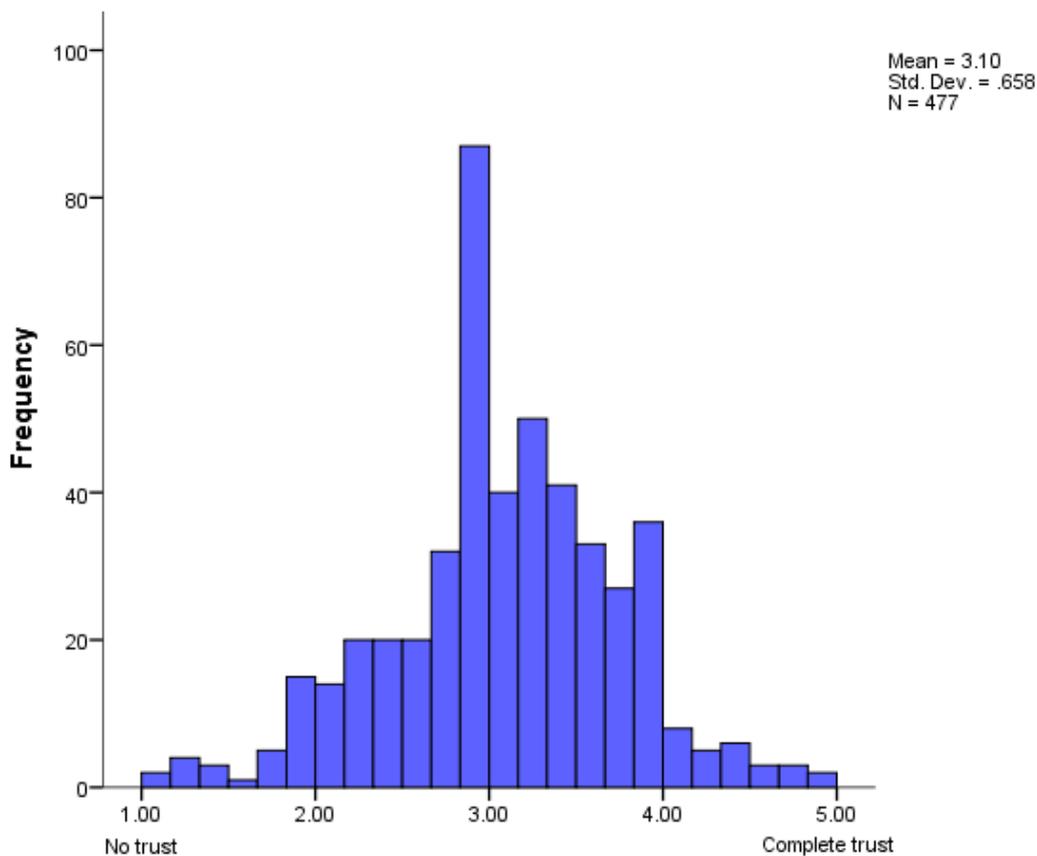


Figure 11. Level of trust in sources of livestock animal welfare information (Cronbach's alpha=0.75)

As can be seen in Table 9, the most trusted source of livestock animal welfare information was information gained from reading product labels. The least trusted source was information received from social media network sites and related social media (e.g., Facebook, Youtube, Twitter).

Table 9. Distributions of Level of Trust in Sources of Livestock Animal Welfare Information

	No trust				Complete trust
	1	2	3	4	5
Social media	24.3	28.1	33.0	13.0	1.6
Print media	7.8	13.0	50.9	23.9	4.4
Radio	6.2	16.6	48.3	23.4	5.5
Television	7.3	13.8	47.3	25.5	6.1
Animal welfare related websites	14.1	10.5	26.2	29.6	19.5
Friends, relatives or colleagues	4.6	12.4	38.1	32.4	12.4
Product labels	6.6	8.9	34.9	37.4	12.3

5.4 Knowledge

PCA confirmed the presence of one factor explaining 65.20% of the variance in perceived knowledge of the livestock industry. Perceived knowledge consisted of five items measured on a 5-point scale (1=Nothing at all, 5=A lot). High scores on this scale indicate high levels of perceived knowledge with respect to various livestock animal industries. As can be seen in Table 10, on average, perceived knowledge is generally quite low ($M= 2.76, SD=0.92$). In particular, respondents felt that they knew the least about the pork industry with 23.8% of respondents reporting that they know nothing at all about the pork industry. In comparison, respondents felt that they knew the most about the egg industry. For example, only 12.3% of respondents reported that they knew nothing at all about the egg industry. Further to this, 22.3% and 9.4% reported that they knew at least a moderate amount or a lot about the egg industry. Fewer than 33% of respondents felt that they knew at least a moderate amount about any industry.

Table 10. Distributions of Perceived Knowledge of Livestock Industries (N=479, Cronbach's alpha=0.86)

Livestock Industry	Nothing at all (%)	Very Little (%)	A little Bit (%)	A moderate amount (%)	A lot (%)
Pork	23.8	35.7	22.5	12.5	5.4
Sheep (meat)	15.4	31.3	30.7	15.7	6.9
Sheep (wool)	14.0	26.7	26.9	24.0	8.4
Beef	11.3	25.1	32.4	22.8	8.6
Egg	12.3	23.8	32.2	22.3	9.4

Table 11 contains the questions used to assess actual knowledge of livestock practices. Knowledge was assessed by asking respondents to correctly identify 11 livestock procedures. A question was classified as correct if the respondent selected the correct one of the two options. "Don't knows" were classified as incorrect. A summary scale was created as a measure of knowledge by summing correct answers to the 11 questions. Inter-item reliability for the knowledge of livestock practices subscale is below optimal levels but given these items cover practices in several different livestock industries this is to be expected.

Figure 12, shows that the number of questions answered correctly ranged from one to 11. Of all the knowledge questions, most participants (73.5%) answered between six and nine questions correctly out of eleven.

As can be seen in Table 11 the most well-known practices were hot iron branding (85.8%), free-range chickens (77.7%), tail docking (77.7%), feedlotting (72.0%) and dehorning (71.0%). The least well known procedures were those relating to slaughter. These were Halal meat (26.6%) pre-slaughter stunning (51.1%) and Kosher meat (53.0%).

Table 11. Knowledge of Livestock Practices (N=479, Kuder-Richardson Coefficient=0.41)

Livestock Practice	Percentage Correct	Don't Know ^a (%)
Halal meat – in Australia, production of Halal approved meat typically involves a reversible method of stunning	26.7	13.57
Pre-slaughter stunning – renders an animal unconscious immediately prior to stunning	51.1	6.68
Kosher meat – in Australia, Kosher approved meat typically comes from animals that have not undergone any method of stunning	53.0	17.33
Crutching – shearing of wool around the rear end of the sheep	58.7	6.26
Mulesing – cutting and removal of skin around the rear end of a sheep	61.8	9.18
Clipping teeth – clipping teeth on intensively farmed pigs to prevent injury	67.8	10.44
Dehorning – removal of the horns to prevent injury	71.0	2.71
Feedlotting – fattening animals in a relatively small enclosure	72.0	4.38
Tail docking – removal of a tail	77.7	4.17
Free-range chickens – chickens that have access to an outdoor area as they please	77.7	0.83
Hot iron branding – use of a hot iron to brand livestock for identification purposes	85.8	1.25

^a Don't know options were classified as incorrect

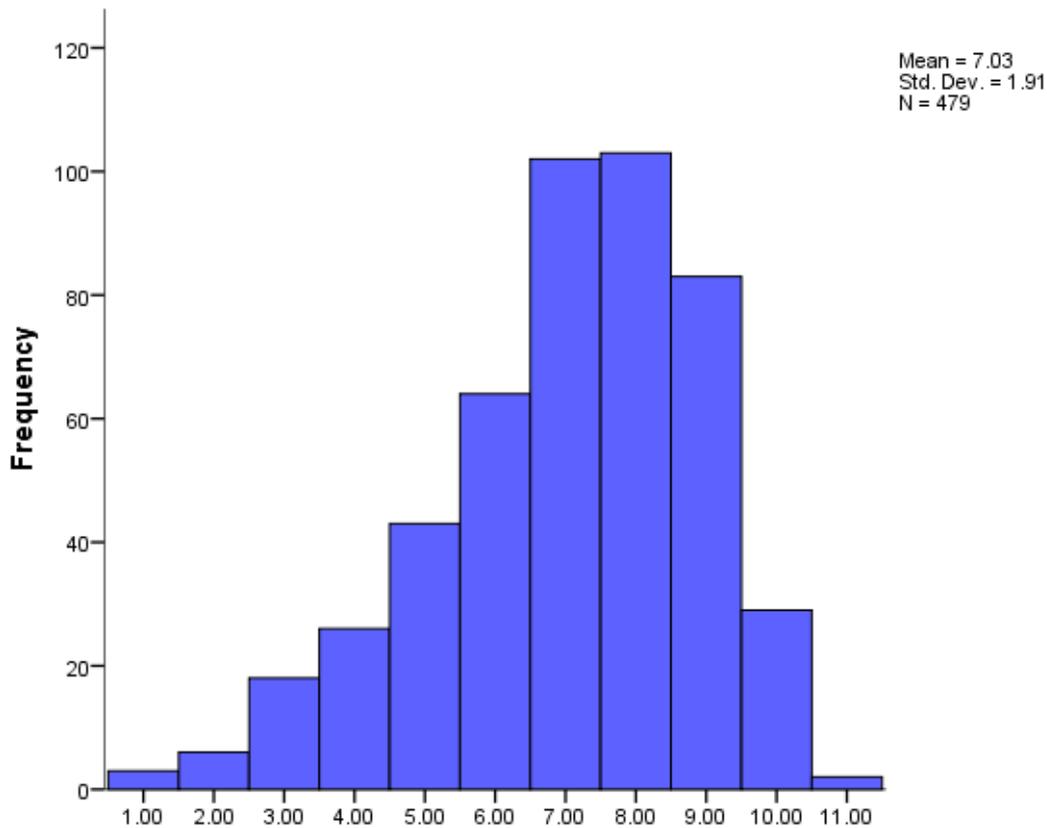


Figure 12. Number of knowledge of livestock practices questions answered correctly

Although significant, the correlation between perceived knowledge and actual knowledge was quite low ($r=0.15$, $p < 0.01$).

5.5 Approval of livestock practices

Table 12 presents the distribution of approval ratings of respondents towards various livestock practices. The most highly approved practices in the livestock industries were free range (Approve=20%, Strongly approve=70.5%) and euthanasia of sick/injured/dying animals (Approve=20%, Strongly approve=69.6%). The most highly disapproved livestock practices were confinement (Strongly disapprove =40.1%, Disapprove=25.2%), hot iron branding (Strongly disapprove=40.1%, Disapprove=25.2%) and live sheep and cattle sea transport (Strongly disapprove=30.9%, Disapprove=16.7%). Interestingly, a large proportion of respondents reported that they did not know enough about curfew (38.4%) and mulesing (22.3%) to approve or disapprove of the practices.

Table 12. Distribution of Respondents' Approval of Livestock Practices (N=477, Cronbach's alpha=0.88)

Livestock Practice	Mean	Strongly disapprove	Disapprove	Neither disapprove nor approve	Approve	Strongly approve	Don't know ^a
Confinement	2.10	40.1	25.2	23.7	6.8	4.2	4.8
Hot iron branding	2.59	40.1	25.2	23.1	14.2	11.5	1.7
Live sheep and cattle <u>sea</u> transport	2.59	30.9	16.7	25.6	15.9	10.8	1.5
Feed-lotting animals	2.73	21.5	20.4	31.1	17.9	9.1	7.9
Clipping teeth	2.75	21.7	17.5	36.1	13.8	11.0	10.4
Tail docking	2.76	24.8	20.1	23.5	16.8	14.7	3.3
Mulesing	2.85	20.4	17.2	31.7	17.7	12.9	22.3
Kosher meat	2.96	15.8	16.4	36.6	18.4	12.7	19.6
Curfew	2.97	9.5	13.9	56.9	9.5	10.2	38.4
Halal meat	2.98	18.2	11.3	39.9	15.3	15.3	15.2
De-horning	3.04	18.9	15.9	26.8	19.5	18.9	2.7
Castration	3.22	16.2	12.8	26.2	22.1	22.7	3.5
Crutching	3.44	10.5	14.5	24.3	21.7	29.0	12.3
Live sheep and cattle <u>ground</u> transport	3.52	6.1	10.6	32.6	26.8	23.9	1.3
Pre-slaughter stunning	3.89	7.4	6.6	17.5	26.6	41.9	4.4
Euthanasia of sick/injured/dying animals	4.52	2.7	1.5	6.1	20.0	69.6	1.0
Free range	4.57	1.3	1.7	6.5	20.0	70.5	.8

^a Don't know responses were deleted from the frequency distributions

5.6 Importance of husbandry and natural living attributes to the well-being of livestock animals.

Tables 13 and 14 present the distribution of responses to the importance of husbandry and natural living attributes to the well-being of livestock animals. All items were measured on a 5-point Likert scale (1=Not at all important, 5=Very important). PCA with Oblimin rotation revealed a two-factor solution explaining 46.64% of the variance. Two subscales were created on the basis of these results. The first subscale consisted of seven items describing various husbandry attributes. The second subscale describes more natural living conditions.

As can be seen from Table 13, husbandry attributes thought to be most important to the well-being of livestock animals included good ventilation, good nutrition, regular exercise and good waste disposal. Table 14 shows that the natural living attributes thought to be most important were freedom to roam outdoors and social contact with the same species.

Table 13. Distribution of Respondents' Level of Importance of Husbandry Attributes to the Well-being of Livestock Animals (N=479, Cronbach's alpha=0.79)

Husbandry Attributes	Mean	Not at all important 1	2	3	4	Very important 5
Medications	4.43	0.6	2.5	12.2	22.6	62.0
Vaccinations	4.59	0.2	1.7	8.4	18.7	71.1
Protection from predators	4.70	0.6	1.0	4.6	15.7	78.1
Good waste disposal	4.72	0.6	0.8	3.2	16.8	78.5
Regular exercise	4.74	0.2	-	3.3	18.2	78.2
Good nutrition	4.85	0.2	0.2	1.3	10.9	87.5
Good ventilation	4.86	-	-	1.9	10.5	87.6

Table 14. Distribution of Respondents' Level of Importance of Natural Living Attributes to the Well-being of Livestock Animals (N=479, Cronbach's alpha=0.72)

Husbandry Attributes	Mean	Not at all important 1	2	3	4	Very important 5
Individual housing	3.04	11.9	17.9	38.4	18.5	13.4
Social contact with different species	3.10	11.0	17.8	37.6	17.6	15.9
Outdoor housing	4.21	3.0	1.9	15.6	30.7	48.8
Contact with offspring	4.38	1.5	2.9	12.0	23.1	60.5
Social contact with the same species	4.44	0.8	1.7	9.6	28.1	59.7
Freedom to roam outdoors	4.62	0.6	1.9	5.2	19.9	72.4

5.7 Community behaviours

Figure 13 presents the number of activities respondents have engaged in to express their dissatisfaction in relation to the way animals are treated in Australia's livestock industries. As can be seen, three quarters of the sample engaged in at least one of the 13 activities to express their dissatisfaction. Table 15 shows that the most common community behaviours were talking to colleagues, family members or friends (55.3%), donating money to an animal welfare organisation (46.6%), or signing a petition (36.3%).

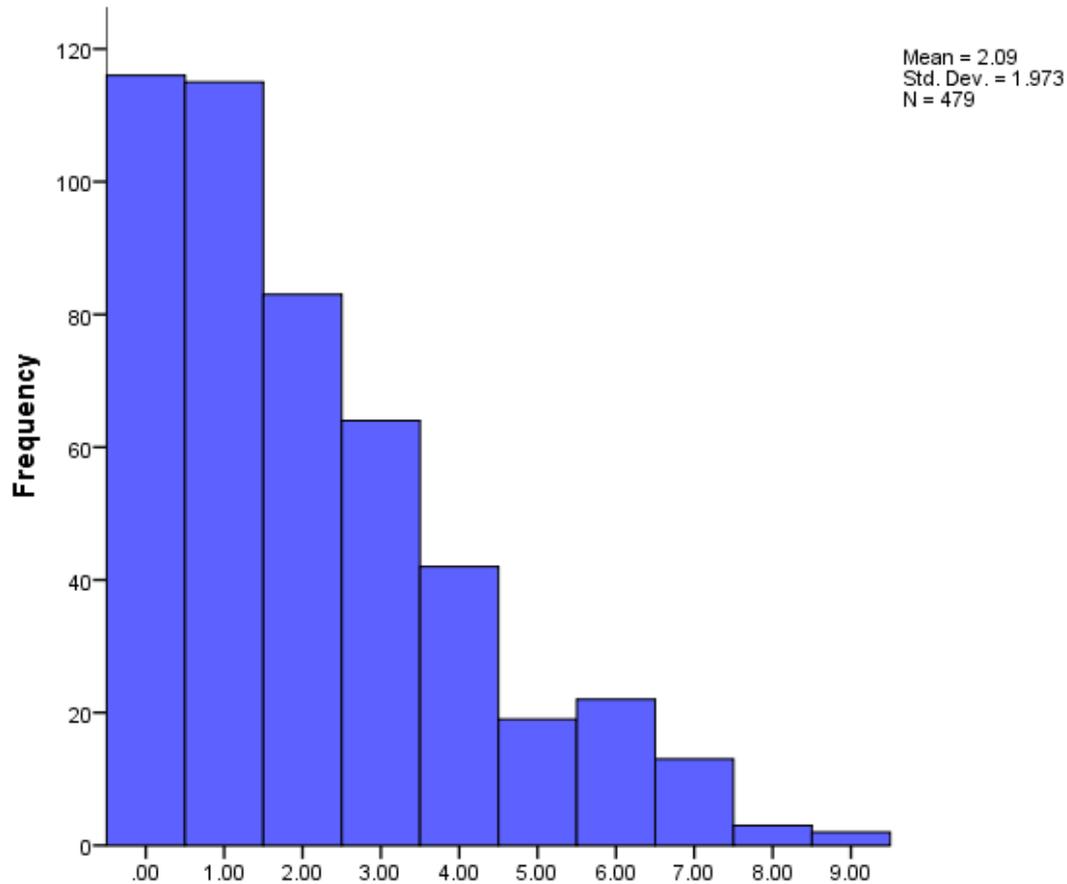


Figure 13. Number of community behaviours engaged in by respondents

Table 15. Types of Activities Engaged in by Respondents in order to Express Dissatisfaction

	Frequency	Percent
Spoken to colleagues, family members, or friends	265	55.3
Donated money to animal welfare organisations ^a	223	46.6
Signed a petition	174	36.3
Shared or liked a page on a networking site (e.g., Facebook)	123	25.7
Volunteered your services to animal welfare organisations ^a	56	11.7
Written a letter to a politician	45	9.4
Written a letter to a newspaper	19	4.0
Contributed to an online collaborative project (e.g., Wikipedia)	18	3.8
Posted a video or other media to a content community (e.g., Youtube)	18	3.8
Called a radio talk back segment	11	7.5
Written a blog (e.g., Twitter)	7	1.5
Created a group on a networking site (e.g., Facebook)	6	1.3

^a Animal welfare/rights groups most commonly noted by respondents discussed in text

5.7.1 Donating money to animal welfare and animal rights groups

Respondents reporting that they donated money to animal welfare or animal rights groups were asked to list up to three of the groups that they donated to. When asked which groups, 38.84% named more than two groups or organisations. By far the most common group donated to was the RSPCA which was named by 122 respondents. The next most common groups were the Animal Welfare League (N=21), World Wildlife Fund (N=18) and Animals Australia (N=10).

5.7.2 Volunteering at animal welfare or animal rights groups

Few respondents had volunteered at an animal welfare or animal rights group or organisation (11.7%). When asked to specify which groups, 38.18% mentioned more than one organisation. Again the most common group or organisation was the RSPCA (N=28).

5.7.3 Group membership

Only 9.4% of respondents reported that they were currently members of an animal welfare or animal rights group or organisation. Of those respondents currently a member, the most common membership was to the RSPCA with 16 of the 45 respondents claiming membership.

5.7.4 Accessing animal welfare information

Respondents were asked on a scale from 1=Never to 5=Always, the frequency with which they accessed animal welfare information from various sources. As can be seen in Table 16, the most frequently accessed source of animal welfare information was from product labels. Product labels were always read for livestock animal welfare information by 33.0% of respondents and often read by 24.4% of respondents. The least accessed source for information was from social network sites and related social media (e.g., Facebook, Youtube, Twitter).

Table 16. Frequency of Accessing Livestock Animal Welfare Information

	Never	Rarely	Sometimes	Often	Always
Social media	57.6	20.3	15.2	4.0	2.9
Print media	33.6	23.2	24.8	11.3	7.1
Radio	42.6	21.7	21.7	8.6	5.4
Television	17.5	19.8	34.7	17.3	10.6
Product labels	12.5	8.1	21.9	24.4	33.0

In order to probe for information about animal welfare related websites, respondents were asked if they visited livestock animal welfare websites and, if so, to name up to three of the websites in order of frequency. It was found that only 17.12% of respondents visited animal welfare websites. The most frequently visited website was the RSPCA website. This website was named by 42.68% of respondents who visited livestock animal welfare sites.

5.8 Opinion leadership

Opinion leadership consisted of three items adapted from Childers (1986). The first item asked respondents to indicate, during the last six months, how many people they had told about Australian livestock animal welfare (1=Told no one, 5=Told a number of people). The second item asked respondents to rate the likelihood, compared to their friends, of being asked about Australian livestock animal welfare (1=Not at all likely to be asked, 5=Very likely to be asked). The last item asked respondents to, overall, indicate in all their discussions, with friends and family whether they were used as a source of advice on Australian livestock animal welfare (1=Not used, 5=Often used).

The distributions for the mean of the three items that comprised the opinion leadership scale are given in Figure 14. Clearly most respondents scored less than 3 indicating that very few respondents consider themselves to be opinion leaders in the area of livestock animal welfare. These items were used in a two-step cluster analysis to identify the respondents who could be classified as opinion leaders (Table 17). This resulted in 15.4% of respondents being identified as opinion leaders.

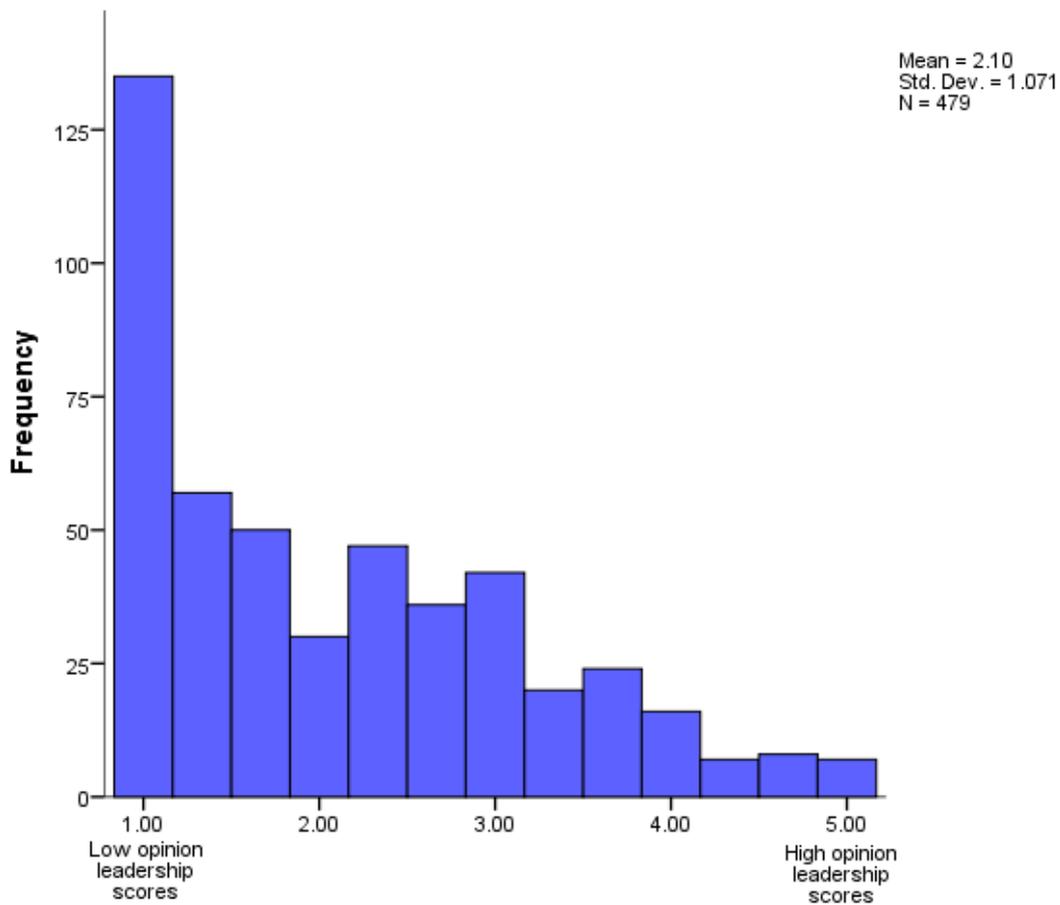


Figure 14. Distribution of the opinion leadership scale (Cronbach's alpha = 0.77)

Table 17. Mean responses on Information Source questions for Opinion Leaders and Non-leaders (n=479)

	Opinion non-leaders	Opinion leaders
During the past six months, how many people have you told about Australian livestock animal welfare?	1.92	3.80
Compared with your friends, how likely are you to be asked about Australian livestock animal welfare?	1.76	4.12
Overall, in all of your discussions with friends and neighbours are you?	1.60	3.80

A comparison between opinion leader and non-leaders showed that leaders generally expressed more concern about and more positive attitudes towards animal welfare (Table 18). Opinion leaders also reported higher perceived knowledge, but not actual knowledge. They also reported engaging in more community behaviours and in accessing more information about animal welfare. There were no significant differences between male and female opinion leaders in actual or perceived knowledge.

Table 18. Comparisons of Opinion Leaders and Non-leaders on Demographics, Attitudes, Knowledge and Behaviour

	t	df	Sig (2-tailed)	Mean Difference
Remoteness	-.15	473.00	.88	-.01
Household weekly income	-1.75	354.00	.08	-.85
Attitudes towards livestock animal welfare	3.75	477.00	.00	.39
Attitude towards eating meat	-3.37	477.00	.00	-.32
Beliefs about welfare standards in the Australian livestock industries	-2.61	477.00	.01	-.27
Trust in the people involved in Australian livestock industries	-1.77	475.00	.08	-.22
Welfare ratings	-3.07	475.00	.00	-.32
Perceived knowledge	6.26	477.00	.00	.70
Knowledge of livestock practices	.37	477.00	.71	.09
Perceived negative impact of the Australian livestock industries on the environment	-.36	477.00	.72	-.21
Approval of livestock practices	-1.49	477.00	.14	-.14
Husbandry attributes	3.10	477.00	.00	.16
Natural living attributes	3.14	477.00	.00	.25
Animal welfare/rights group membership	6.59	477.00	.00	.34
Community behaviour	7.24	477.00	.00	1.72
Donations	3.71	477.00	.00	.39
Count volunteer	6.29	477.00	.00	.40
Accessing information	10.34	477.00	.00	.95
Trust in information	3.67	477.00	.00	.30
Age	-2.11	477	.04	-4.62

A discriminant function analysis was carried out to identify the characteristics that best discriminated opinion leaders from non-leaders (Table 19). The variables that best discriminated the groups were age, perceived knowledge, animal welfare/rights group membership, volunteering behaviour and frequency of accessing information. These variables correctly classified people into groups with an accuracy of 81.8%

(Table 20).

Table 19. Variables that significantly discriminated between Opinion leaders and Non-leaders

Standardized Canonical Discriminant Function Coefficients	
Age	-.342
Perceived knowledge	.359
Membership	.400
Count volunteer	.228
Accessing information	.643

Table 20. Classification accuracy of Discriminant Functional Analysis

		TwoStep Cluster Number	Classification Results ^a		Total
			Predicted Group Membership Opinion leader	Opinion non-leader	
Original	Count	Opinion Leader	50	24	74
		Opinion non-leader	63	342	405

^a81.8% of original grouped cases correctly classified.

5.9 Predicting community and consumer behaviours

Correlational analyses were undertaken to identify variables associated with community and consumption behaviours. Table 21 displays these relationships. As can be seen in Table 21, a number of demographic variables correlated with community behaviours, however these correlations were only weak to moderate in strength. Females were more likely to engage in a higher number of community behaviours to display dissatisfaction with the way livestock animals are treated than males ($r_{pb} = .24, p < .01$). Younger respondents ($r = -.10, p < .05$), respondents with higher levels of education, ($r = .16, p < .01$) and respondents living in more highly accessible areas like major cities ($r = .12, p < .01$) engaged in a higher number of community behaviours than older respondents, respondents with lower levels of education and respondents living in more remote areas.

Attitude and trust variables were more strongly correlated with community behaviours. Among these, attitudes towards livestock animal welfare ($r = .40, p < .01$), trust in sources of animal welfare information ($r = .32, p < .01$), perceived importance of husbandry ($r = .10, p < .05$) and natural living attributes ($r = .28, p < .05$) positively correlated with community behaviours. Attitudes towards eating meat ($r = -.36, p < .01$), beliefs about welfare standards in the Australian livestock industries ($r = -.43, p < .01$), trust in the people involved in Australian livestock industries ($r = -.37, p < .01$), perceived welfare ($r = -.36, p < .01$), perceived negative impact of the Australian livestock industries on the environment ($r = -.36, p < .01$) and approval of livestock practices ($r = -.38, p < .01$) were negatively correlated with community behaviours.

Perceived knowledge, but not actual knowledge, of livestock practices was positively correlated with community behaviours ($r = .12, p < .01$), although this relationship was weak.

Few demographic variables correlated with meat consumption. Small negative correlations were found between the frequency of beef consumption and gender ($r_{pb} = -.16, p < .01$) and between pork consumption and gender ($r_{pb} = -.18, p < .01$). This means that male respondents consumed beef and pork products more

often than females. Older respondents consumed seafood products ($r=.23, p<.01$) more often than younger respondents but consumed chicken less often than younger respondents ($r=-.12, p<.01$).

A number of attitude and trust variables correlated with meat consumption. The frequency of beef consumed during an average week was positively correlated with positive attitudes towards eating meat ($r=.47, p<.01$), beliefs about welfare standards in the Australian livestock industries ($r=.30, p<.01$), trust in people involved in the Australian livestock industries ($r=.31, p<.01$), perceived negative impact of the Australian livestock industries on the environment ($r=.29, p<.01$) and approval of livestock practices ($r=.36, p<.01$). Beef consumption was negatively correlated with attitudes towards livestock animal welfare ($r=-.25, p<.01$) and perceived importance of natural living attributes ($r=-.11, p<.05$). A small positive correlation was also found between beef consumption and knowledge of livestock practices ($r=.10, p<.05$).

The frequency of chicken consumed in an average week was negatively correlated with attitudes towards livestock animal welfare ($r=-.16, p<.05$). Chicken consumption was positively correlated with attitude towards eating meat ($r=.39, p<.01$), beliefs about welfare standards in the Australian livestock industries ($r=.17, p<.01$), trust in the people involved in the Australian livestock industries ($r=.21, p<.01$), perceived welfare ($r=.26, p<.01$), perceived negative impact of the Australian livestock industries on the environment ($r=.19, p<.01$) and approval of livestock practices ($r=.15, p<.01$).

The frequency of lamb consumed in an average week was negatively correlated with attitudes towards livestock animal welfare ($r=-.22, p<.01$) and perceived importance of natural living attributes ($r=-.16, p<.01$). Lamb consumption positively correlated with attitudes towards eating meat ($r=.36, p<.01$), beliefs about welfare standards in the Australian livestock industries ($r=.23, p<.01$), trust in the people involved in the Australian livestock industries ($r=.28, p<.01$), perceived welfare ($r=.32, p<.01$), perceived negative impact of the Australian livestock industries on the environment ($r=.18, p<.01$) and approval of livestock practices ($r=.31, p<.01$). Perceived knowledge also positively correlated with lamb consumption ($r=.18, p<.05$).

A pattern of similar relationships emerged for pork consumption. Attitudes towards livestock animal welfare was negatively correlated with pork consumption ($r=-.20, p<.01$) and perceived importance of natural living attributes ($r=-.12, p<.05$). Pork consumption positively correlated with attitudes towards eating meat ($r=.29, p<.01$), beliefs about welfare standards in the Australian livestock industries ($r=.23, p<.01$), trust in the people involved in the Australian livestock industries ($r=.22, p<.01$), perceived welfare ratings ($r=.26, p<.01$), perceived negative impact of the Australian livestock industries on the environment ($r=.14, p<.05$), approval of livestock practices ($r=.23, p<.01$). A small positive correlation was found between knowledge of livestock practices and pork consumption ($r=.11, p<.05$).

Only one small correlation was found between the frequency of seafood consumed in an average week and attitude, trust and knowledge variables. Trust in sources of animal welfare information was positively but weakly correlated with seafood consumption ($r=.09, p<.05$).

Table 21. Correlates of Community Behaviour and Reported Frequency of Meat Consumption

	Community behaviour	Beef	Chicken	Lamb	Pork	Seafood
Gender (male=1, female=2)	.24**	-.16**	.01	-.07	-.18**	.00
Age	-.10*	-.08	-.12**	.01	-.04	.23**
Household income	.07	.04	.10	.03	.06	.00
Level of education	.16**	-.02	-.01	-.02	-.03	.08
Remoteness	.12**	-.06	-.01	-.05	-.04	.02
Live or lived on a farm with animals	.06	-.08	.03	-.07	-.02	-.03
Dog ownership (yes=1, no=0)	.08	.07	.10*	.06	.00	-.05
Cat ownership (yes=1, no=0)	.08	.02	.02	-.05	-.02	-.03
Attitudes towards livestock animal welfare	.40**	-.25**	-.16**	-.22**	-.20**	.00
Attitude towards eating meat	-.36**	.47**	.39**	.36**	.29**	.11*
Beliefs about welfare standards in the Australian livestock industries	-.43**	.30**	.17**	.23**	.23**	-.01
Trust in the people involved in Australian livestock industries	-.37**	.31**	.21**	.28**	.22**	.00
Welfare ratings	-.36**	.29**	.26**	.32**	.26**	.06
Perceived knowledge	.12**	.02	-.05	.18**	.08	.02
Knowledge of livestock practices	.00	.10*	-.01	.07	.11*	.01
Perceived negative impact of the Australian livestock industries on the environment	-.36**	.29*	.19**	.18**	.14**	-.02
Approval of livestock practices	-.38**	.36**	.15**	.31**	.23**	-.01
Husbandry attributes	.10*	.00	.02	.00	-.03	-.06
Natural living attributes	.28**	-.11*	-.04	-.16**	-.12**	.01
Animal welfare/rights group membership (yes=1, no=2)	-.36**	.12*	.10*	.06	.10*	.03
Accessing information	.48**	-.08	-.10*	.00	-.07	.07
Trust in information	.32**	-.01	.01	-.02	-.03	.09*

*p<.05, **p<.01, two tailed.

In order to determine which combination of variables best predict community and consumer behaviours, a series of stepwise multiple regressions were conducted with community behaviour and consumption of beef, chicken, lamb, pork and seafood as the dependent variables. Household income was not recorded for 25.7% of the sample so including this variable in regressions would have reduced the sample size thereby reducing the power of these analyses. It was therefore decided not to include this variable in subsequent analyses.

A summary of significant predictors is presented in Table 22. Detailed summaries of the regression models including Beta and t values are provided in Appendix B.

Table 22. Summary of significant predictors of Community Behaviour and Meat Consumption

Predictor variable	Community behaviour	Beef	Chicken	Lamb	Pork	Seafood
Gender		✓			✓	
Age		✓	✓			✓
Level of education	✓					✓
Remoteness						
Live or lived on a farm with animals						
Dog ownership	✓					
Cat ownership						
Attitudes towards livestock animal welfare	✓			✓		
Attitude towards eating meat		✓	✓	✓		✓
Beliefs about welfare standards in the Australian livestock industries	✓					
Trust in the people involved in Australian livestock industries						
Welfare ratings				✓	✓	
Perceived knowledge				✓		
Knowledge of livestock practices						
Perceived negative impact of the Australian livestock industries on the environment	✓					
Approval of livestock practices	✓	✓				✓
Husbandry attributes						✓
Natural living attributes						
Animal welfare/rights membership	✓					
Accessing information	✓					
Trust in information	✓					✓

As can be seen in Table 22, nine variables accounted for 46% of the variance in self-reported community behaviours ($F_{9,451} = 44.25, p < .001$). Two demographic variables, level of education ($\beta = .14$) and dog ownership ($\beta = .08$), were significant predictors of community behaviours. This indicated that the respondents who reported higher levels of education and respondents who owned a pet dog were more likely to engage in community behaviours that displayed dissatisfaction with the way animals are treated than those with lower levels of education and those who did not own a dog. Three attitude variables also significantly predicted community behaviours. ‘Beliefs about welfare standards in the Australian livestock industries’ ($\beta = -.10$) and ‘attitudes towards the Australian livestock industries and the environment’ ($\beta = -$

.15) were negatively associated with community behaviours that display dissatisfaction with the way livestock animals are treated while 'attitudes towards livestock animal welfare' ($\beta=.11$) was positively associated with community behaviours. Trust in sources of livestock animal welfare information ($\beta=.11$) and frequency of accessing animal welfare information ($\beta=.32$) were also positively associated with community behaviours. Further to this, respondents who reported that they were not members of an animal rights or welfare group ($\beta=-.20$) were less likely to engage in community behaviours as were respondents who reported high levels of approval of livestock practices ($\beta=-.09$).

As can also be seen in Table 22, attitudes towards eating meat significantly predicted consumptions of all meat products. Whether or not other variables significantly predicted meat consumption was dependent on the meat product. The amount of variance explained by the predictor variables also varied depending on the meat product. It should also be noted here that the influence of some predictor variables may have been masked by their relationship with other predictors. For example, beef consumption negatively correlated with attitudes towards livestock animal welfare ($r=-.25$) but also negatively correlated with attitudes towards eating meat ($r=-.33$). Inter-correlations among attitudes, trust, knowledge and behaviour variables are presented in Appendix C.

Four variables accounted for 27% of the variance in self-reported frequency of beef consumption ($F_{4,456}=43.25$, $p<.001$). Attitudes towards eating meat was the strongest predictor ($\beta=.39$) indicating that respondents with positive attitudes towards eating meat reported a higher frequency of consuming beef than those with less positive attitudes. Approval of livestock practices ($\beta=.18$) was also positively associated with beef consumption. Two demographic variables, age ($\beta=-.15$) and gender ($\beta=-.09$), were significantly associated with beef consumption. This indicates that older people and females reported the consumption of less beef compared to younger people and males.

Two variables accounted for 17% of the variance in the self-reported frequency of chicken consumption ($F_{2,458}=49.16$, $p<.001$). Positive attitudes towards eating meat were positively associated with chicken consumption ($\beta=.40$). Age was negatively associated with chicken consumption ($\beta=-.15$), indicating that younger people reported eating chicken more frequently than older people.

Four variables accounted for 17% of the variance in self-reported lamb consumption ($F_{4,456}=25.30$, $p<.001$). Positive attitudes towards eating meat were again the strongest predictor ($\beta=.27$). Perceived knowledge ($\beta=.15$) and perceived welfare ($\beta=.12$) were also positively associated with lamb consumption, suggesting that higher perceived knowledge and perception of livestock welfare predicted higher self-reported lamb consumption. Attitudes towards livestock animal welfare were inversely associated with lamb consumption ($\beta=-.09$).

Pork consumption was predicted by three variables ($F_{3,457}=20.04$, $p<.001$). Together they explained 11% of the variance in self-reported frequency of eating pork. Positive attitudes towards eating meat ($\beta=.20$) and perceived welfare ($\beta=.13$) were positively related to pork consumption. Gender was the only demographic variable which predicted pork consumption ($\beta=-.14$), indicating that males reported consuming pork more frequently during an average week compared to females.

Nine percent of the variance in self-reported frequency of eating seafood could be explained by knowledge, attitudes and trust variables ($F_{6,454}=9.15$, $p<.001$). Two demographic variables; age ($\beta=.27$) and education ($\beta=.10$), were positively associated with seafood consumption. Attitudes towards eating

meat ($\beta = .17$) and trust in livestock animal welfare information ($\beta = .14$) were positively related to seafood consumption. Husbandry attributes ($\beta = -.10$) and approval of livestock practices ($\beta = -.11$) were negatively associated with seafood consumption.

6. Discussion

There were five specific aims of the project: first, to determine attitudes towards livestock animal welfare; second, to determine levels of knowledge of livestock practices in the community; third, to explore levels of trust in the livestock industries; fourth, to investigate the extent to which demographics, attitudes, trust and knowledge are related to community behaviours; and fifth, to identify opinion leaders and their characteristics in terms of demographics, attitudes, levels of trust and behaviour.

6.1 Attitudes towards livestock animal welfare

Most people expressed positive attitudes towards livestock animal welfare with 60% scoring above the neutral point of 3.0 on the rating scale. This finding is in line with previous studies which suggest that Australians rate animal welfare as an important issue. A report conducted by Roy Morgan (2000) for example, found that 54% of Australians consider animal welfare and animal cruelty to be an important issue. The majority of respondents hold positive attitudes towards eating meat and indicated the belief that meat is, for example, part of a balanced diet. These attitudes are reflected in high meat consumption of this sample. Over 90% of the respondents eat a diet of meat and vegetables and most respondents self-reported the consumption of meat and other animal products at least once a week.

Respondents were equally divided on their beliefs about the current state of Australian livestock welfare standards. It may be useful to explore the reasons for this by further research. If half the population have some concerns about current standards, it may help in forming policy to determine the specific nature of these concerns. They may relate to a specific industry or practice or simply may be a general impression that is not based on any detailed knowledge or experience.

Attitudes towards eating meat were positively correlated with the self-reported frequency of eating meat. While this is not too surprising, the results in this survey showed much higher correlations between attitudes to animal welfare and consumption than had been previously reported by Coleman and Toukhsati (2006). In this survey, significant negative correlations were found between “attitudes towards livestock animal welfare” and the frequency of eating lamb, pork and beef. In comparison, “Humane treatment of animals” showed low correlations with beef and lamb consumption in the survey conducted by Coleman and Toukhsati (2006).

It may be that community attitudes are beginning to become more salient to meat consumption or it may be that differences in the specific attitudes measured in the current survey compared to the Coleman and Toukhsati’s survey may account for these differences. Only by tracking public attitudes over time using the same attitude measures will it be possible to determine if this is true.

Trust in the people involved in the livestock industries consistently correlated with all forms of meat consumption except for seafood, as did beliefs about welfare standards in the Australian livestock industries and approval of livestock practices. It may be useful to follow up these results with point-of-sale research to determine whether the self-reported consumption patterns are reflected in actual consumption behaviour. Interestingly, on almost all measures there was little concern about the seafood industry.

6.2 Knowledge of livestock practices in the community

The degree of knowledge of livestock practices varied depending on the procedure. Livestock procedures

such as hot iron branding, free range chickens, tail docking, feedlotting and dehorning were correctly identified by most respondents. Procedures relating to slaughter including Halal meat, Pre-slaughter stunning and Kosher were commonly mis-identified. This lack of knowledge surrounding slaughter may be indicative of a lack of information available on the procedures or, as in the case of Halal slaughter the percentage correct was only 26.7%, some kind of misinformation in the community. It may also be indicative of respondents' desire to be 'deliberately ignorant' of this aspect of the livestock industry (IGD, 2007). Of interest, crutching and mulesing were also commonly confused. When asked what crutching was, approximately 41% respondents thought that crutching was cutting and removal of skin around the rear end of a sheep. The results in this survey are generally similar those found by Coleman and Toukhsati (2006).

Generally speaking, a substantial proportion of respondents felt that they knew little about the livestock industries. For the sheep (wool), beef and egg industries, about 32% felt that they knew a moderate amount or a lot, whereas knowledge about the pork and sheep (meat) industries was much lower at 22.6% and 17.9% respectively. The correlation between perceived and actual knowledge was significant but weak ($r=0.15$). Together these results suggest that the community is not well informed about livestock farming. It would be useful to undertake a public education program in a specific community (for example a country town) to determine the effects on community attitudes and behaviour. If effective, such a program could be used in the wider community.

6.3 Trust in the livestock industries

Two aspects of trust were investigated in this survey; first, trust in the available information and second, trust in the people working with livestock.

The greatest trust in information sources was in product labels and in friends and relatives, presumably because labels are regulated sources of information and friends are well-known and have a history of trust. Animal welfare websites were also well trusted, although preferences were difficult to interpret because of the huge diversity of sites nominated. Respondents were given the option of nominating up to three sites. The most common site nominated first was the RSPCA at 22.5% with no other site being endorsed by more than 10% of respondents. There was a large miscellaneous other group of sites that were cited first but no individual site being nominated with a high frequency. Animal rights groups including PETA, Voiceless, Animal Liberation Front, Animal welfare league and WSPA combined were nominated first by 3.8% of respondents. Government and industry sites were nominated first by 12.1%. Social media and the mass media received lower trust ratings with social media clearly the least trusted. The importance of the RSPCA as a trusted source of animal welfare information is consistent with previous studies (Southwell et al., 2006) and suggest that there is an important role for the RSPCA to disseminate accurate information. These results also suggest that there is an implication that government and industry sites may have some penetration into the community.

In general, the majority of people (about 60%) indicated some level of trust in livestock workers to properly care for their animals. However, while only 8.4% indicated a low level of trust in farmers to properly care for their animals, 41% showed low trust in sea transport workers, 24% indicated low trust in land transport workers and 23% indicated low trust in abattoir workers. These results probably indicate that the adverse publicity that sea transport has received has led to a popular view that sea transport workers are responsible for the welfare issues that have been reported. This is an empirical question and little research of the kind that Hemsworth and Coleman (2011) have done on-farm has been done on

stockperson attitudes and behaviour in land or sea transport. This needs to be done and appropriate interventions and monitoring processes need to be developed.

6.4 Community behaviours

Despite high consumption patterns of meat, three quarters of the sample engaged in at least one of the 13 community behaviours to express their dissatisfaction with the way livestock animals are treated. Speaking to colleagues, family members, or friends and donating money to an animal welfare or animal rights group were the most frequent behaviours. The prevalence of speaking to friends and colleagues (55.3%) was higher than that found by Coleman and Toukhsati's (2006) survey (44.6%). Petition signing was also higher here (36.3%) compared to 23.1% in the survey conducted by Coleman and Toukhsati. Donating money was similar in both surveys. Volunteering services to a welfare organisation was higher in this survey (11.7%) compared to the Coleman and Toukhsati survey (6.0%). 'Liking' a page on a networking site, such as Facebook, was a common behaviour found in this survey (25.7%), which has not been assessed before. These data indicate that community behaviour patterns are changing, in part due to social networking, but also due to actual increases in proactive behaviours such as volunteering and petition signing. These may reflect an escalation in community activities that may impact on the livestock industries.

When asked which organisation people engaged with, the RSPCA was the most common response. This may reflect an awareness of the role that the RSPCA has in monitoring animal welfare. It also indicates that people are more engaged with an animal welfare organisation rather than the organisations that focus on animal rights.

The demographic variables that correlate with community activities were: gender, with females engaging in these behaviours more than males; education, with the higher educated engaging in more behaviours, and; animal welfare group membership, with members engaging in more behaviours. However, most attitude variables also correlated with community behaviour. Altogether, 46% of the variation in community behaviour could be accounted for by a combination of demographics, attitude and trust variables. Actual knowledge was not correlated at all with community behaviours.

These results provide a clear indication that community attitudes are associated with a range of activities that have the potential to impact on both livestock practices as well as licence to practice. The finding that trust in livestock workers and approval of livestock practices had amongst the highest correlations with behaviour provides some evidence for this.

This suggests that not only should attempts be made to address the negative attitudes that exist in the community, but also that trust and acceptability of practices need to be addressed.

6.5 Opinion leaders

While it was possible to identify a group of people who reported being used as a source of animal welfare information by those around them, there was little demographic information to distinguish this group. Age was the one demographic variable with younger people more likely to be opinion leaders. Animal welfare group membership was also an identifying characteristic. The remaining variables that discriminated opinion leaders from non-leaders were attitudes towards the livestock industries and perceived knowledge.

Interestingly, opinion leaders, similar to the full sample, nominated the RSPCA first as a trusted source of information (25.7%) and nominated government and industry sources 12.2% of the time. Animal rights groups received no first nominations by opinion leaders.

Given that attitudes have been shown in this survey to be correlated with meat consumption and community behaviours, opinion leader attitudes clearly are important. However, opinion leader attitudes reflected a less positive view of the livestock industries and lower trust. Interestingly, although actual knowledge of livestock practices did not differ between opinion leaders and non-leaders, nor did their experience in living on farms, opinion leaders perceived their knowledge to be greater than non-leaders. It seems likely, therefore, that opinion leaders may be motivated by an ideological perspective that is not necessarily informed by knowledge or experience.

Given the finding that welfare organisation membership was an identifying characteristic of opinion leaders and given the observed differences in attitude and perceived knowledge between leaders and non-leaders, engaging animal welfare organisations in processes that facilitate good communication amongst stakeholders is a good approach towards community education. The AAWS is an example of this that is no longer available, so alternative approaches need to be found.

6.6 Methodological issues.

The sample of 479 Australian respondents consisted of 228 males and 251 females. The age of participants ranged from 19 to 90 years old. Most age ranges were equally represented. Older people (61 years old and older) were however more highly represented in this sample (26.9%) compared to their proportion of the population as reported by the ABS (19.79%) (2013a). This means that the results may be slightly biased in favour of older Australian residents' perceptions and behaviours. The results may also be slightly biased in favour of more highly educated Australians. According to the ABS (Australian Bureau of Statistics, 2013b), 24.6% of persons aged between 15 and 64 years reported having achieved a Bachelor degree or above in Australia whereas in this sample, 42.2% of respondents reported that they had achieved a university or higher educational institution qualification.

The method used in this survey was telephone interview. This is a costly method and one where it is difficult to sample males and young people. Many research companies have a database of people who are willing to participate in surveys on-line and it would be worthwhile to conduct this survey using this method to determine if the results are similar. This method costs about 25% of a telephone survey.

6.7 Implications

This survey has provided some important data on community attitudes and knowledge towards the livestock industries as well as the relationships between these variables and consumption and community behaviours. In some cases there needs to be more research to clarify the reasons for some of the findings, in other cases appropriate responses to deal with the issues need to be developed and implemented. Some of the key actions are:

- Given differences observed between the findings reported here and earlier work, it would be useful to repeat this survey on a regular basis to track changes in community attitudes and behaviour.
- There is a mismatch between perceived and actual knowledge of livestock practices and this needs to be improved. It is proposed that a public education program in a specific community (for example a country town) be developed to determine the effects on community attitudes and behaviour. If

effective, such a program could be used in the wider community.

- There is widespread distrust of off-farm animal workers to care for their animals properly. There is a need for research of the kind that Hemsworth and Coleman (2011) have done on-farm but focusing on stockpeople working in land or sea transport. Appropriate interventions and monitoring processes need to be developed.
- Given the important role that the RSPCA appears to have as a source of information, a means of engaging the organisation as well as other animal welfare organisations in ongoing discussions of welfare issues needs to be established, particularly given the demise of the AAWS.
- The characteristics and role of opinion leaders need to be investigated further. If forums such as AAWS are not available to communicate directly with at least some opinion leaders, an alternative strategy may need to be developed.
- There is an imperative to ensure that there is good and reciprocal communication between the livestock industries and the community. This is essential if the community is to be well informed and able to make rational choices and if the industry is to respond appropriately to community expectations.

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Appendix A: Perceptions towards the Australian livestock industries questionnaire



Hi, my name is, I'm calling from I-View on behalf of Melbourne University. You are invited to take part in a 30 minute anonymous survey by Melbourne University about your knowledge of, and attitudes towards Australian livestock animal welfare and the Australian livestock industries. Would you be able to help us out today please?

To help with our selection process can I speak to the youngest male/female in the household who is 18 years or over?"

Instructions: If the person who answers is that person, then continue. If the person is available repeat opening paragraph when they come on-line. If the person is not available, ask when they will be available and organise a call back time.

IF AGREE TO PARTICIPATE IN THE SURVEY READ THE FOLLOWING:

Great, thanks. Before we start I am required to read out some information to you regarding this study.

This project has been approved by the Melbourne University Ethics Committee and is being conducted by Prof Grahame Coleman and Vanessa Rohlf at the University of Melbourne School of Land and Environment

This research will be written up as a report and in journal articles and possibly presented at academic conferences. To protect your anonymity we will not ask for your name or contact details and any data collected during this study will be kept in a separate, password-protected computer file. All data will be kept securely in the Melbourne School of Land and Environment for five years from the date of publication, before being destroyed.

Participation in this study is completely voluntary and you're free to withdraw at any stage of the survey. Because of the anonymous nature of this research, it will not be possible to locate and delete your responses from the data file once you have completed the survey.

If you would still like to participate, can I confirm that you have understood the information that I have just read out?

Should you require any further information or would like to be informed of the aggregate research findings, please do not hesitate to contact Vanessa.Rohlf@unimelb.edu.au. Should you have any concerns about the conduct of the project, you are welcome to contact the Executive Officer, Human Research Ethics, The University of Melbourne, on ph: 8344 2073, or fax: 9347 6739.

Section A: Questions about you and your family

This section contains questions about you. Your individual responses will remain strictly confidential. Only summary results for the entire sample will be used. For each question, please select the response that best answers the question for you.

A1. Are you? DRO

1. Male
2. Female

A2. What is your year of birth? _____ YYYY IF UNDER 18 OR REFUSE TERMINATE

A3. What is your highest level of education?

SR, READ OUT

1. No Formal Schooling
2. Primary School
3. Secondary School
4. Technical or further educational institution (including TAFE College)
5. University or other higher educational institution
6. Other educational institution (write) _____

A4. What is your current residential address postcode? _____

- Don't know (DRO)

A5. Who do you normally live with?

MR, READ OUT

1. Partner or spouse
2. Dependent child or children (including step-children)
3. Parent(s)
4. Brother/Sister
5. Unrelated flatmate or co-tenant
6. Other _____

A6. What is your household weekly income from all sources, before taxes?

SR

1. Negative income
2. Nil income
3. \$1 - \$199 per week
4. \$200-\$299 per week
5. \$300-\$399 per week
6. \$400-\$599 per week
7. \$600-\$799 per week
8. \$800-\$999 per week
9. \$1,000-\$1,249 per week
10. \$1,250-\$1,499 per week

- 11. \$1,500-\$1,999 per week
- 12. \$2,000-\$2,499 per week
- 13. \$2,500-\$2,999 per week
- 14. \$3,000-\$3,499 per week
- 15. \$3,500-\$3,999 per week
- 16. \$4,000-\$4,999 per week
- 17. \$5,000 or greater per week

18 Prefer not to say (DRO)

0 Don't Know (DRO)

A7. What is your religious affiliation?

SR, DO NOT READ OUT

- 1. Catholic
- 2. Anglican
- 3. Uniting Church
- 4. Presbyterian and Reformed
- 5. Eastern Orthodox
- 6. Baptist
- 7. Lutheran
- 8. Pentecostal
- 9. Buddhism
- 10. Islam
- 11. Hinduism
- 12. Judaism
- 13. No religion
- 14. Do not wish to answer
- 15. Other (write) _____

A8. What (if any) dogs or cats live at your current home?

Animal	Number
1. <input type="checkbox"/> Dog(s)	_____
2. <input type="checkbox"/> Cat(s)	_____
3. None	

A9. Have you lived, or do you now live on a farm with animals?

- 1. Yes
- 2. No

IF CODE 1 'YES' GO TO A9a OTHERWISE SKIP TO A10.

A9a. And what types of animals were/ are these?

MR, READ OUT

1. Poultry (meat)
2. Poultry (egg)
3. Dairy
4. Pig
5. Beef
6. Sheep
7. Other (write) _____

This next section contains questions about your consumption of animal products. For each question, please select the option or the number that most closely represents your situation or behaviour.

A10. Would you describe yourself primarily as a...?

SR, READ OUT

1. Meat and vegetable eater (A person who eats a variety of foods including red & white meat)
2. Vegetarian (A person who does not eat red or white meat, including fish, but eats eggs and dairy products)
3. Vegan (A person who eats no animal products at all)
4. Other _____

A11. How often would you eat the following foods in an average week?

Select the number on a scale from 1 to 5 that most closely represents your average weekly intake of each food type where 1 = never, 2 = less than once a week, 3 = once a week, 4 = 2-3 times a week and 5 = more than 3 times a week.

	Never	Less than once a week	Once a week	2-3 times a week	More than 3 times a week
1. Beef.....	1	2	3	4	5
2. Chicken.....	1	2	3	4	5
3. Lamb.....	1	2	3	4	5
4. Pork.....	1	2	3	4	5
5. Eggs.....	1	2	3	4	5
6. Seafood	1	2	3	4	5
7. Dairy products	1	2	3	4	5

Section B: Questions about animal welfare

B1. Which one of the following descriptions best captures what animal welfare means to you?

Please rate on a scale from 1 to 5 where 1 = does not describe animal welfare at all and 5 = completely describes animal welfare.

	Does not describe animal welfare at all			Completely describes animal welfare		Don't Know (DRO)
1. Promoting good food quality	1	2	3	4	5	0
2. Humane treatment of animals	1	2	3	4	5	0
3. Caring for our pets	1	2	3	4	5	0
4. Livestock farmers and handlers using best practice	1	2	3	4	5	0
5. Preventing animal cruelty	1	2	3	4	5	0
6. Conserving native species	1	2	3	4	5	0
7. Protecting the rights of animals	1	2	3	4	5	0
8. Livestock farmers and handlers caring for their animals	1	2	3	4	5	0
9. Balancing the needs of animals and people	1	2	3	4	5	0

B2. Rate the acceptability of animal uses on a scale of 1= extremely unacceptable to 5= extremely acceptable

	Extremely unacceptable			Extremely acceptable		Don't Know (DRO)
1. Using animals for the production of food	1	2	3	4	5	0
2. Using animals for the production of clothing	1	2	3	4	5	0
3. Using animals as companions (pets)	1	2	3	4	5	0
4. Using animals for research	1	2	3	4	5	0
5. Using animals for sport and entertainment	1	2	3	4	5	0

The rest of the questions contained in this survey ask you about your opinions, behaviours and knowledge with regard to livestock animals and the livestock industries. When we talk about livestock animals we are referring to any animal bred and raised in Australia for the purpose of food or clothing.

At times we will refer to livestock animals in general but there will be other times when we will refer to specific livestock animals like sheep used for wool, pigs used for pork or cattle used for beef.

B3. This set of questions asks you about your attitudes towards livestock animals. On a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree, to what extent do you agree or disagree with the following statements

	Strongly disagree			Strongly agree			Don't Know (DRO)
1. Livestock animals have the same right to life as humans	1	2	3	4	5	0	
2. Humans are more important than livestock animals.	1	2	3	4	5	0	
3. Livestock animals have the same rights as domestic pets						0	
4. Too much fuss is made over livestock animal welfare	1	2	3	4	5	0	
5. The welfare of livestock animals is an important consideration for me	1	2	3	4	5	0	
6. People should do whatever is necessary (legal or illegal) to stop animals being used in livestock production systems	1	2	3	4	5	0	

B4. These questions ask you about your attitudes towards animals as a source of food. On a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree, to what extent do you agree or disagree with the following statements

	Strongly disagree			Strongly agree			Don't Know (DRO)
1. Free range foods taste better than intensively farmed foods	1	2	3	4	5	0	
2. People have a right to eat meat	1	2	3	4	5	0	
3. Meat is part of a balanced diet	1	2	3	4	5	0	
4. Meat is a healthy food	1	2	3	4	5	0	
5. Australian livestock farmers deserve better prices and purchase conditions from supermarkets	1	2	3	4	5	0	

B5. These questions ask you about your attitudes towards the Australian livestock industry. Please tell me the extent to which you agree or disagree with each statement where 1= strongly disagree and 5 = strongly agree

	Strongly disagree				Strongly agree	Don't Know (DRO)
1. The standards of livestock animal welfare on Australian farms need to be improved	1	2	3	4	5	0
2. Livestock animal welfare standards in Australian abattoirs are very high.	1	2	3	4	5	0
3. Live animal exports from Australia should continue	1	2	3	4	5	0
4. Increased regulation of the treatment of livestock animals is needed	1	2	3	4	5	0
5. Australian abattoirs are dedicated to maintaining the welfare of livestock animals prior to slaughter.	1	2	3	4	5	0
6. Compared to overseas, Australian abattoirs operate to good livestock animal welfare standards.	1	2	3	4	5	0

B6. Thinking about the people involved in the Australian livestock industry, how would you rate your level of trust in these people to properly care for their animals. Please answer the following questions on a scale from 1 to 5 where 1 = strongly disagree and 5=strongly agree.

	Strongly disagree				Strongly agree	Don't Know (DRO)
1. I trust farmers to properly care for their animals	1	2	3	4	5	0
2. I trust abattoir workers to properly care for their animals	1	2	3	4	5	0
3. I trust livestock animal handlers to properly care for their animals	1	2	3	4	5	0
4. I trust those responsible for transporting livestock animals by <u>sea</u> to properly care for their animals	1	2	3	4	5	0
5. I trust those responsible for transporting livestock animals by <u>land</u> to properly care for their animals	1	2	3	4	5	0

B7. On a scale from 1 to 5, how would you rate the welfare of the following Australian livestock animals where 1 = very poor and 5 = very good.

	Very poor					Very good	Don't Know (DRO)
	1	2	3	4	5		0
1. Laying hens (producing eggs)	1	2	3	4	5		0
2. Dairy cows (producing milk)	1	2	3	4	5		0
3. Pigs (meat)	1	2	3	4	5		0
4. Beef (meat)	1	2	3	4	5		0
5. Sheep (meat)	1	2	3	4	5		0
6. Sheep (wool)	1	2	3	4	5		0
7. Goats (meat)	1	2	3	4	5		0

Section C: Questions about your knowledge of livestock animals and livestock animal welfare

This set of questions asks about how much you feel you know about the livestock industry and livestock industry practices. For each question, please select the option that most closely represents your situation where 1=you feel know nothing at all to 5=you feel you know a lot.

C1. How much do you feel you know about the following Australian livestock industries

	Nothing at all	Very little	A little bit	A moderate amount	A lot
	1	2	3	4	5
1. The beef industry	1	2	3	4	5
2. The sheep (meat) industry	1	2	3	4	5
3. The sheep (wool) industry	1	2	3	4	5
4. The pork industry	1	2	3	4	5
5. The egg industry	1	2	3	4	5

These questions ask you about your knowledge of livestock practices. Please answer the following questions to the best of your ability. What do the following livestock practices involve? For each item, select the option that you believe to be the correct answer (**Multiple choice items will be reordered randomly**)

READ OUT QUESTION AND ANSWER OPTIONS

NOTE FOR PROGRAMMER – PLEASE HAVE THIS INSTRUCTION AT THE TOP OF QC2-C12:

PROBE FULLY IF RESPONDENT IS UNSURE

C2. Mulesing.....

- a) shearing wool around the rear end of a sheep
- b) cutting and removal of skin around the rear end of a sheep

Refused to answer (DRO, only use if respondent still refuses after probing)

C3. Kosher meat

- a) In Australia, production of Kosher approved meat typically involves a reversible method of stunning
- b) In Australia, Kosher approved meat typically comes from animals that have not undergone any method of stunning

Refused to answer (DRO, only use if respondent still refuses after probing)

C4. Crutching

- a) shearing of wool around the rear end of the sheep
- b) cutting and removal of skin around the rear end of a sheep

Refused to answer (DRO, only use if respondent still refuses after probing)

C5. Dehorning.....

- a) removal of the horns to prevent injury
- b) filing down the horns

Refused to answer (DRO, only use if respondent still refuses after probing)

C6. Pre-slaughter stunning.....

- a) paralyses an animal immediately prior to slaughter
- b) renders an animal unconscious immediately prior to slaughter

Refused to answer (DRO, only use if respondent still refuses after probing)

C7. Tail docking.....

- a) removal of a tail
- b) clipping the tail back with a peg

Refused to answer (DRO, only use if respondent still refuses after probing)

C8. Feedlotting animals.....

- a) fattening animals in a relatively small enclosure
- b) hand feeding animals on pasture Refused to answer (DRO, only use if respondent still refuses after probing)

C9. Clipping teeth.....

- a) clipping teeth on intensively farmed pigs to prevent injury
 - b) clipping teeth to prevent the formation of cavities in pigs teeth
- Refused to answer (DRO, only use if respondent still refuses after probing)

C10. Hot iron branding.....

- a) use of a hot iron to brand livestock for identification purposes
 - b) branding meat with a hot iron for identification purposes
- Refused to answer (DRO, only use if respondent still refuses after probing)

C11. Free-range chickens.....

- a) Chickens that are free to roam around in a large shed
 - b) Chickens that have access to an outdoor area as they please
- Refused to answer (DRO, only use if respondent still refuses after probing)

C12. Halal meat.....

- a) In Australia, production of Halal approved meat typically involves a reversible method of stunning
 - b) In Australia, Halal approved meat typically comes from animals that have not undergone any method of stunning
- Refused to answer (DRO, only use if respondent still refuses after probing)

Section D: Questions about your attitudes towards livestock practices

D1. These questions ask you about your attitudes towards the Australian livestock industry and the environment. Please tell me the extent to which you agree or disagree with each statement where 1= strongly disagree and 5 = strongly agree

	Strongly disagree				Strongly agree		Don't know (DRO)
1. Present livestock farming methods are polluting our water supplies	1	2	3	4	5	0	
2. I trust farmers in the livestock industry to protect the environment.	1	2	3	4	5	0	
3. Current meat processing methods are polluting our environment	1	2	3	4	5	0	
4. Fertilisers, pesticides and other farm chemicals are not a threat to the environment if used as directed.	1	2	3	4	5	0	
5. Left to themselves, most livestock farmers would protect the environment	1	2	3	4	5	0	

D2. To what extent do you approve or disapprove of the following procedures carried out in livestock management systems? Indicate your level of approval or disapproval for each procedure by selecting the number on a scale from 1 to 5 that most closely represents your opinion where 1 = strongly disapprove and 5 = strongly approve.

	Strongly disapprove				Strongly approve		Don't Know (DRO)
1. Mulesing	1	2	3	4	5	0	
2. Kosher meat	1	2	3	4	5	0	
3. Crutching	1	2	3	4	5	0	
4. Castration	1	2	3	4	5	0	
5. De-horning	1	2	3	4	5	0	
6. Pre-slaughter stunning	1	2	3	4	5	0	
7. Curfew	1	2	3	4	5	0	
8. Confinement	1	2	3	4	5	0	
9. Tail docking	1	2	3	4	5	0	
10. Feed-lotting animals	1	2	3	4	5	0	
11. Euthanasia of sick/dying/injured animals	1	2	3	4	5	0	

12. Clipping teeth	1	2	3	4	5	0
13. Hot iron branding	1	2	3	4	5	0
14. Live sheep and cattle sea transport	1	2	3	4	5	0
15. Live sheep and cattle ground transport	1	2	3	4	5	0
16. Free-range	1	2	3	4	5	0
17. Halal meat	1	2	3	4	5	0

D3. In your opinion, how important are each of the following attributes to the well-being of livestock animals in general living in farming situations? (1=not at all important and 5 = very important)

	Not at all important				Very important	Don't know (DRO)
1. social contact with same species	1	2	3	4	5	0
2. contact with offspring	1	2	3	4	5	0
3. individual housing	1	2	3	4	5	0
4. freedom to roam outdoors	1	2	3	4	5	0
5. social contact with different species	1	2	3	4	5	0
6. good nutrition	1	2	3	4	5	0
7. regular exercise	1	2	3	4	5	0
8. good ventilation	1	2	3	4	5	0
9. medications	1	2	3	4	5	0
10. good waste disposal	1	2	3	4	5	0
11. vaccinations	1	2	3	4	5	0
12. protection from predators	1	2	3	4	5	0
13. outdoor housing	1	2	3	4	5	0

Section E: Questions about your behaviour in relation to livestock animal welfare

This section contains questions about your general behaviour with regard to various aspects of livestock animal welfare. For each question, please select the option that most closely represents your situation or behaviour.

E1. Are you currently a member of an animal welfare or animal rights group or organisation? (For example, Animals Australia, Animal Welfare League, RSPCA and Animal Liberation Australia)

1. Yes

2 **No**

If yes, please name the group(s) or organisation(s)(max three) _____

E2. Have you ever done any of the following activities to express your *dissatisfaction* in relation to the way animals are treated in Australia's livestock industries?

READ OUT

- written a letter to a politician
 - called a radio talk back segment
 - attended a public rally or demonstration
 - signed a petition
 - donated money to animal welfare organisations
If yes, please tell me which group or groups you have donated money to _____(max three)
 - volunteered your services to animal welfare organisations
If yes, please tell me which group or groups you have volunteered your services to _____(max three)
 - spoken to colleagues, family members, or friends
 - written a letter to a newspaper
 - contributed to an online collaborative project (e.g., Wikipedia)
 - written a blog (e.g., Twitter)
 - posted a video or other media to a content community (e.g., Youtube)
 - created a group on a networking site (e.g., Facebook)
 - shared or liked a page on a networking site (e.g., Facebook)
- None of these

This next set of questions asks about your thoughts on accessing information about Australian livestock animal welfare as well as your thoughts on providing Australian livestock animal welfare information to others.

E3. How regularly do you access livestock animal welfare information from the following sources? Select a number on a scale from 1 to 5 that best indicates the frequency you access each source for animal welfare relevant information, where 1=never and 5 = always.

	Never	Rarely	Sometimes	Often	Always
1. Read or watch livestock animal welfare social network sites, related social media (e.g., Facebook, YouTube, Twitter)	1	2	3	4	5
2. Read livestock animal welfare related <u>print</u> media (e.g., newspapers, magazines, scientific papers)	1	2	3	4	5
3. Listen to livestock animal welfare related broadcasts through radio?	1	2	3	4	5
4. Watch livestock animal welfare related Television (TV news, documentaries)	1	2	3	4	5
5. Read labels (product label)	1	2	3	4	5

E4. If you do visit livestock animal welfare related websites can you please name up to three websites in order of frequency. (NOT COMPULSARY)

E5. Suppose that each of the following has provided information about Australian livestock animal welfare. Please indicate to the extent you would trust that information where 1=no trust and 5=complete trust

	No trust		Complete trust			Don't know
1. Television (e.g., TV news, documentaries)	1	2	3	4	5	0
2. Print media (e.g., magazines, newspapers, journal articles)	1	2	3	4	5	0
3. Social network sites, related social media (e.g., Facebook, YouTube, Twitter)	1	2	3	4	5	0
4. Animal welfare related websites	1	2	3	4	5	0
5. Radio	1	2	3	4	5	0
6. Friends, relatives or colleagues	1	2	3	4	5	0
7. Labels (Product label)	1	2	3	4	5	0

E6. In rank order can you please name the top three sources you would most trust for information about livestock animal welfare information?

SELECT UP TO THREE OPTIONS, DO NOT READ OUT

The Royal Society for the Prevention of Cruelty to Animals (RSPCA)

People for the Ethical Treatment of Animals (PETA)

World Society for the Protection of Animals (WSPA)

Australian Veterinary Association (AVA)

Compassion in World Farming (CIWF)

Animals Australia

Voiceless

Animal Welfare League

International Fund for Animal Welfare (IFAW)

Animal Liberation Front (ALF)

Government

Livestock industry organisations/farmers/breeders

University scientists

Consumer organisations

Friends and family

Political groups

Other _____

I don't know

Please rate yourself on the following scales relating to your interactions with friends and neighbours regarding livestock animal welfare.

E7. During the past six months, how many people have you told about Australian livestock animal welfare?

1
Told no one

2

3

4

5
Told a number of
people

E8. Compared with your friends, how likely are you to be asked about Australian livestock animal welfare?

1	2	3	4	5
Not at likely to be asked				Very likely to be asked

E9. Overall, in all of your discussions with friends and neighbours are you?

1	2	3	4	5
Not used as a source of advice on Australian livestock animal welfare				Often used as a source of advice on Australian livestock animal welfare

ONLY READ OUT IF RESPONDENT REQUESTS THE CONTACT DETAILS AGAIN OTHERWISE MOVE ON

Should you require any further information or would like to be informed of the aggregate research findings, please do not hesitate to contact Vanessa.Rohlf@unimelb.edu.au. Should you have any concerns about the conduct of the project, you are welcome to contact the Executive Officer, Human Research Ethics, The University of Melbourne, on ph: 8344 2073, or fax: 9347 6739.

-----End of survey-----

Appendix B: Stepwise multiple regressions of variables predicting community and consumption behaviour

Stepwise Multiple Regression of variables predicting Community Behaviour

	Beta	t	Sig.
(Constant)		2.42	.016
Accessing information	.32	8.44	.000
Beliefs about welfare standards in the Australian livestock industries	-.10	-2.06	.040
Animal welfare or animal rights group membership	-.20	-5.76	.000
Approval of livestock practices	-.09	-2.02	.044
Level of education	.14	3.87	.000
Concern for livestock animal welfare	.11	2.60	.010
Perceived negative impact of the Australian livestock industries on the environment	-.15	-3.56	.000
Trust in information	.11	2.96	.003
<u>Dog ownership</u>	<u>.08</u>	<u>2.44</u>	<u>.015</u>

$N=460$, $\text{Adj } R^2=.46$, $F(9,451) = 44.25$, $p<.001$

Stepwise Multiple Regression of variables predicting Beef Consumption

	Beta	t	Sig.
(Constant)		3.09	.002
Attitude towards eating meat	.39	8.44	.000
Approval of livestock practices	.18	3.81	.000
Age	-.15	-3.77	.000
<u>Gender</u>	<u>-.09</u>	<u>-2.20</u>	<u>.028</u>

$N=460$, $\text{Adj } R^2=.27$, $F(4,456)=43.25$, $p<.001$

Stepwise Multiple Regression of variables predicting Chicken Consumption

	Beta	t	Sig.
(Constant)		6.97	.000
Attitude towards eating meat	.40	9.50	.000
<u>Age</u>	<u>-.15</u>	<u>-3.54</u>	<u>.000</u>

$N=460$, $\text{Adj } R^2=.17$, $F(2,458)=49.16$, $p<.001$

Stepwise Multiple Regression of variables predicting Lamb Consumption

	Beta	t	Sig.
(Constant)		1.30	.195
Attitude towards eating meat	.27	5.14	.000
Perceived Knowledge	.15	3.48	.001
Welfare Ratings	.12	2.19	.029
Concern for livestock animal welfare	-.09	-2.07	.039

N=460, Adj R²=.17, F(4,456)=25.30, p<.001

Stepwise Multiple Regression of variables predicting Pork Consumption

	Beta	t	Sig.
(Constant)		3.77	.000
Attitude towards eating meat	.20	3.89	.000
Gender	-.14	-3.09	.002
Welfare Ratings	.13	2.41	.016

N=460, Adj R²=.11, F(3,457)=20.04, p<.001

Stepwise Multiple Regression of variables predicting Seafood Consumption

	Beta	t	Sig.
(Constant)		2.04	.042
Age	.27	5.92	.000
Trust in information	.14	2.98	.003
Attitude towards eating meat	.17	3.41	.001
Level of education	.10	2.24	.025
Husbandry attributes	-.10	-2.14	.033
Approval of livestock practices	-.11	-2.09	.037

N=460, Adj R²=.09, F(6,454)=9.15, p<.001

Appendix C: Correlations among demographics, attitudes, trust and knowledge variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1. Gender	-																										
2. Age		-																									
3. Level of education			-																								
4. Remoteness				-																							
5. Dog ownership					-																						
6. Cat ownership						-																					
7. Lived or live on a farm							-																				
8. Concern for livestock animal welfare								-																			
9. Attitude towards eating meat									-																		
10. Beliefs about welfare standards in the Aus livestock industries										-																	
11. Trust in the people involved in Aus livestock industries											-																
12. Welfare Ratings												-															
13. Perceived Knowledge													-														
14. Knowledge of livestock practices														-													

