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Monitoring public attitudes to livestock industries and livestock welfare

**Final Report
APL Project 2018/0014**

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Executive summary

Building upon the earlier study (APL Project number 2012/0026), the present project aimed to adapt the 2013 questionnaire (see Appendix A) to enable it to be used in an ongoing capacity to monitor trends in public attitudes, knowledge and behaviour relating to animal welfare in the primary industry sector and to determine changes in attitudes and behaviours relevant to animal welfare primarily in the livestock industries.

A total of 501 participants (243 females, 258 males) were recruited from all States and Territories of Australia. The updated questionnaire (see Appendix B) took on average 35 minutes to complete by random telephone survey (CATI) and consisted of 134 items. The questionnaire items included 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, 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.

Demographic data indicate that the 2019 survey is comparable to both the 2013 survey and census data. Whilst not pronounced and dependent on product-type, there appears to be a decrease in consumption in animal products; beef intake has reduced in frequency while the other animal products have remained steady. This finding reflects frequency of consumption rather than the amount consumed, however supports other reports that lamb and beef consumption per capita is steadily declining. The prevalence of vegetarianism appears comparable across the 2013 and the 2019 survey, at approximately 7%. An increase in veganism from 0.6% to 1.2% was observed, however these percentages remain very small and as such may not be reliable. Overall, consumption trends appear relatively complex. Consistent with the 2013 survey, a number of attitude and trust variables correlated with meat consumption; including positive attitudes towards eating meat, attitudes towards livestock animal welfare, beliefs about welfare standards in the Australian livestock industries, trust in people involved in the Australian livestock industries, perceived negative impact of the Australian livestock industries and approval of livestock practices.

The results from the present survey provided data relevant to two key aspects of trends in public attitudes and behaviour; the stability of the various measures of attitude, knowledge and behaviour over time and changes in attitudes and behaviour over time. Respondents'

understanding of what animal welfare entails and the measures of attitudes (attitude scales) both remained stable across the two survey samples (i.e. over time). These findings support the continued use of these measures for monitoring trends in public attitudes.

In general, trends showed that public engagement has increased over time; more people appear to be more engaged, opinion leaders' communication activities increased, and respondents generally reported more community behaviours. This suggests a greater awareness of animal welfare issues in the general population. The survey does not provide data on why this might have occurred, however there has been an increase in publicity relating to animal welfare issues in recent years. Given that publicity is generally negative and public attitudes towards livestock animal welfare have tended to become more negative, increased engagement by the public represents a threat to licence to farm.

In the 2019 survey, there has been a trend for some public attitudes to livestock animal welfare to become more negative, while others have shown little change. Most categories of acceptability of animal use showed a small decrease over time. There was, however, no change in public perceptions of the welfare of livestock animals, attitudes towards livestock animal welfare, attitudes towards eating meat, beliefs about animal welfare standards, perceived negative impact of the Australian livestock industries on the environment and the rated importance of housing and husbandry attributes of farm animals. Consequently, the way people viewed management of animals, and, therefore the criteria that were used to assess welfare, remained largely the same over time.

Trust in the Australian livestock industries decreased as did both trust and approval ratings of people responsible for transporting livestock by land and, in particular, sea. Trust correlated significantly with both consumption of most animal products and community behaviours in opposition to the livestock industries and, as such, this decline in trust represents a threat both to the sale of animal products and licence to farm. People have remained most trusting of information obtained from product labels, television, print media or from conversations with friends, relatives or colleagues, while trust in social media and animal welfare websites has declined.

In the 2013 and the 2019 surveys, both actual knowledge and perceived knowledge of livestock husbandry practices was low and were not correlated with each other. There was a tendency for actual knowledge to have decreased over time (i.e. decreased over the two surveys). However, actual knowledge was uncorrelated with animal product consumption and community behaviour.

As was the case for the 2013 sample, a subset of the 2019 sample were identified as opinion leaders on the basis that they reported being used as sources of information about farm animal welfare and provided such information to the people that they encountered. The proportion of opinion leaders identified in the 2019 sample was smaller than in the 2013 sample, however their characteristics were similar in that they tended to be more negative about farm animal welfare, had higher perceived knowledge but no better actual knowledge than the remainder of the sample (non-opinion leaders), reported engaging in more community behaviours and in accessing more information about animal welfare. That this result is consistent across the surveys indicates that the potential importance of these people in influencing community attitudes warrants investigation.

The relationships between attitudes and demographic variables, and community and consumption variables were reasonably consistent across the 2013 and the 2019 surveys. This indicates that these variables remain important predictors of community behaviour and, to a lesser extent, consumption. Of importance, these variables were even stronger predictors of community behaviours in the 2019 sample than had been the case in the 2013 sample. This supports the proposition that attempting to address these attitudes may be an important way of mitigating the threats that community behaviours pose for licence to farm. What needs further investigation is why people hold the attitudes that they do and, therefore, what can be done to address these attitudes.

The data set comprising responses to the two questionnaires provides a data base that can be mined to answer other questions. It is recommended that stakeholders consider what further questions might be answered using these data.

In summary, the 2019 survey indicates:

1. The measures used are reliable over time
2. People's engagement in animal welfare issues is increasing
3. People's attitudes are tending to become more negative
4. People's trust in those working in abattoirs and sea transport is declining
5. There is an increased use of and trust in personal information sources of animal welfare information rather than institutionalised sources
6. There is an increasing risk to licence to farm

Finally, the main differences in trends over time is shown in the figure below:

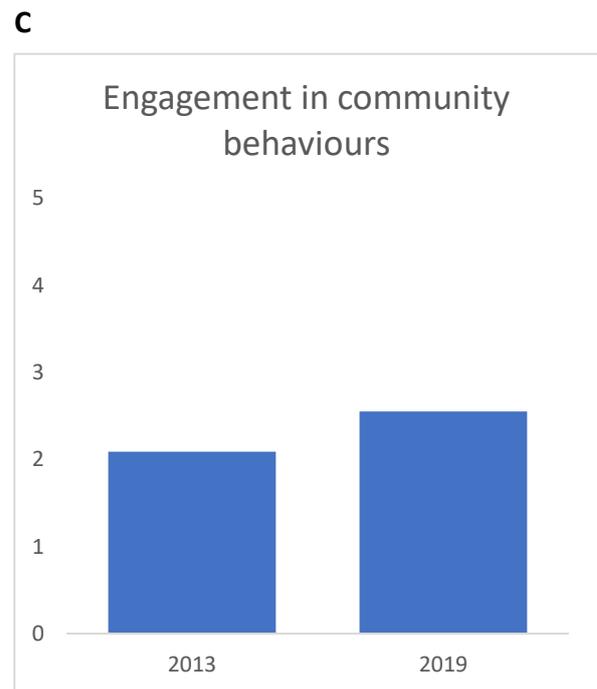
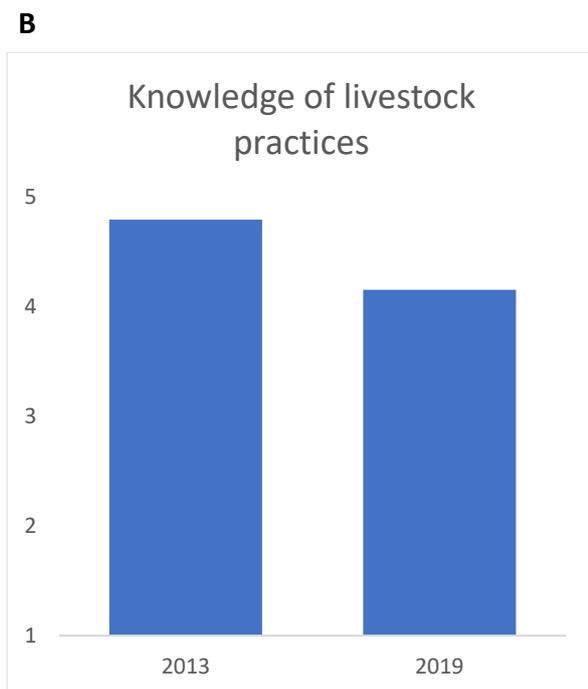
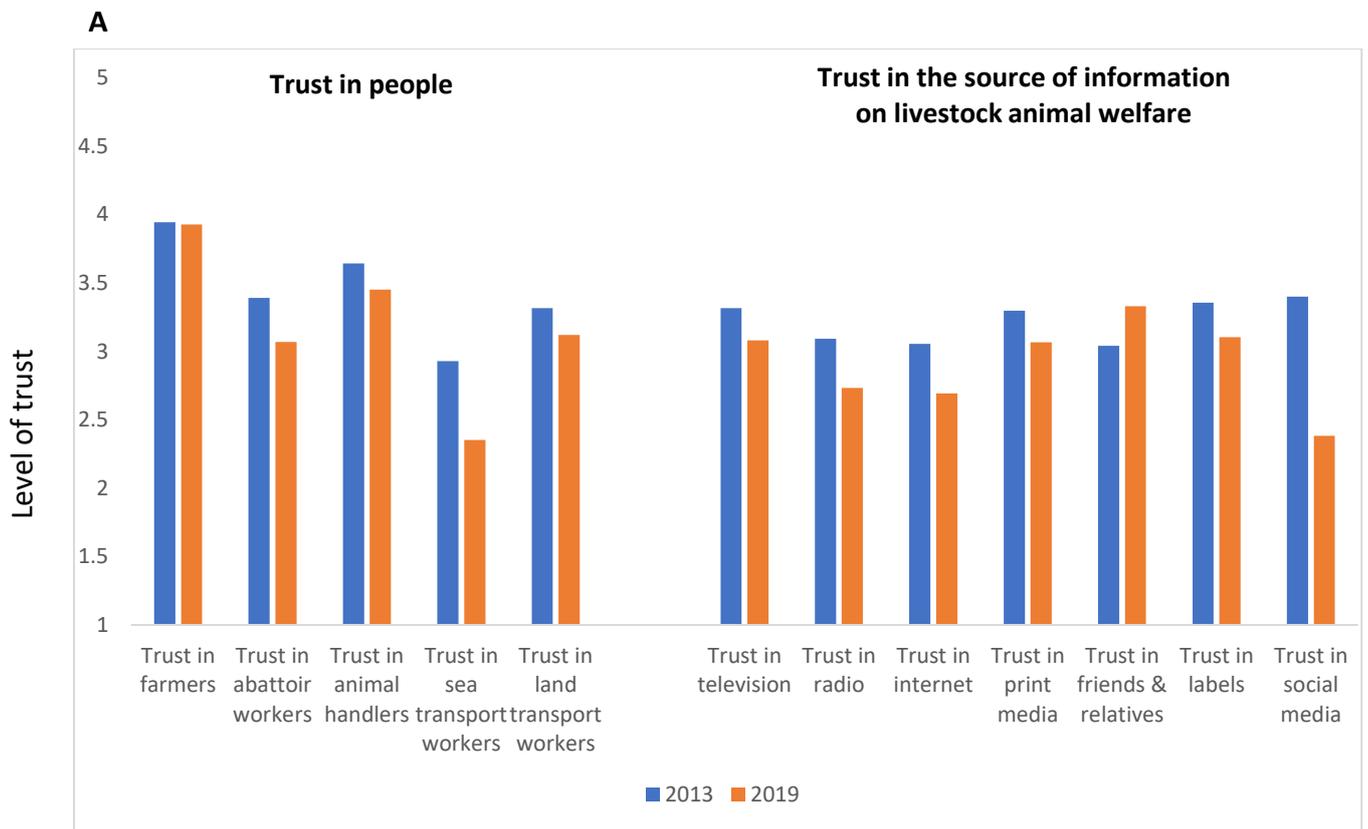


Figure: The main changes in (A) trust with higher value indicating higher level of trust, (B) number of knowledge of livestock practice questions answered correctly, (C) number of community behaviour engaged in by participants.

Background

Public attitudes have a role in determining how people behave as consumers and as citizens (Coleman 2010). The public is often a key driver of animal welfare change since public views affect decision makers at the political, regulatory, retail and industry levels. Although there is limited evidence on the association between public attitudes towards animal welfare and its subsequent effect on purchasing decisions (Coleman *et al.* 2005; Coleman and Toukhsati 2006), in long run, it may affect commercial viability and even the sustainability of animal industries. Indeed, in case of livestock issues, public has been seen to take opportunistic actions by performing specific behaviours such as signing petitions, donating money or even discussing about topical welfare issues with people around them (Coleman *et al.* 2018). As a result, failure to meet the expectations of the public can hamper the success of the livestock industries and threaten their social license to farm, which can ultimately lead to increased litigation, increased regulations, and increasing consumer demands (Arnot 2008; Coleman *et al.* 2018).

Public concern for animal welfare remains high in Australia, as reflected by changing consumer and community behaviours. In recent years, independent animal-rights organisations have evoked strong community behaviour on specific welfare issues that has led to changes in the code of practice and ultimately industry changes in Australia (e.g. 'Save Babe campaign that led to phasing out of gestation stalls in sows) (Animals Australia, 2016; Coleman *et al.*, 2018). This concern is consistent with that documented from many industrialised nations including Sweden, Spain, Finland and Australia (European Commission, 2007; Gracia, 2013; Parbery & Wilkinson, 2012; Phillips *et al.*, 2012; Southwell *et al.*, 2006). In Australia, reports indicate that 54% of Australians consider animal welfare and cruelty to animals to be an important issue (Roy Morgan Research, 2000). A recent report commissioned by the Department of Agriculture and Water Resources to identify expectations of farm animal welfare to understand whether the current regulations are perceived to be sufficient suggests that 95% of people view farm animal welfare to be a concern and 91% want at least some reform to address this perceived concern (Futureye 2019).

Public concern about animal welfare is largely 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, 2007). Consistent with this awareness, there has been increasing demand for 'animal welfare friendly' products including organic and free-

range foods (Southwell *et al.* 2006; Blokhuis *et al.* 2013). For example, in Australia, the sale of free-range eggs increased from 34% in 2011 to 54% in 2018 (retrieved 23 June 2019 from www.australianeggs.org.au). A decline in meat consumption has been reported in many countries including the United States (Fonseca-Nunes *et al.* 2014), United Kingdom (Department for Environment, Food and Rural Affairs, 2012), Finland (Vinnari *et al.* 2010), Germany, Netherlands and Hungary (Kanerva 2013). Furthermore, vegetarianism is also becoming increasingly popular in several countries (Lea and Worsley 2001; Povey *et al.* 2001; Allen and Baines 2002). Between 2012 and 2016, the number of Australian adults whose diet is all or almost all vegetarian rose from 1.7 million people (or 9.7% of the population) to almost 2.1 million (11.2%) (Roy Morgan Research, 2016). Whilst these changes in consumer behaviour 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, 2007; Holm & Mohl, 2000).

An increasing public concern for the welfare of livestock animals is also reflected in community behaviours performed in opposition to the livestock industry. These community behaviours are not lobbying behaviour which involves deliberate and repetitive campaigning of politicians and regulatory bodies for change (Coleman & Toukhsati, 2006), but are opportunistic behaviour that involve taking advantage of current issue at hand and voicing their opinion (Coleman *et al.*, 2018). In comparison, community behaviour is less deliberate and involves taking advantage of situational opportunities to express an attitude through action (Coleman & Toukhsati, 2006). Community behaviours may include actions such as signing a petition, donating money to an animal welfare organisation, participating in rallies and speaking with family/friends/acquaintances about an issue. Furthermore, increasingly popular social media provide a platform for community behaviours in opposition to the livestock animal welfare industry to also take the form of posting videos or writing blogs (Coleman *et al.* 2014). A number of recent studies have found a high prevalence of community behaviours. Coleman and Toukhsati (2006) found that 56% of respondents surveyed at supermarket and by telephone reported that they had engaged in at least one activity in opposition to livestock farming (n=1061), while Coleman *et al.* (2014) reported 75% of telephone respondents engaged in at least one community behaviour to express their dissatisfaction with the way livestock animals are treated (n=500). The most commonly reported community behaviours were speaking to colleagues, family members or friends and donating money to an animal welfare or animal rights group.

Community behaviours and the public attitudes which drive them have the ability to significantly influence how Governments either react to publicised 'animal welfare events' or regulate contentious management practices in industry (Coleman *et al.*, 2014). This is

particularly evident when concerns are expressed by non-governmental animal welfare or rights organisations. The 'Save Babe' campaign is one example where community pressure, harnessed by animal welfare/rights organisations, led to industry changes. In 2006, Animals Australia (a federation of animal welfare groups in Australia) launched the 'Save Babe' campaign to oppose and raise public awareness about the confinement of sows in sow stalls and farrowing crates (Animals Australia, 2016). This campaign and the community pressure that followed, led directly to industry changes whereby the revised Australian Code of Practice included changes to the duration that gestating sows can be housed in stalls. In addition to the legislative changes, Coles supermarkets adopted a 'sow stall free' brand where all Coles brand pork products now come from sow stall free farms (Coles 2016).

While community concerns and behaviours affect how Governments react to animal welfare events, they also impact more broadly on the livestock industry's social licence to practice. Animal welfare issues together with environmental issues relating to climate change, water scarcity, and declining biodiversity all threaten farmers' social license to farm. Social licence to farm has been defined as the latitude that society allows to its citizens to exploit resources for their private purposes (Martin *et al.* 2011). And social license is granted when industries behave in a manner that is consistent with both their legal obligations and community expectations (Gunningham *et al.* 2004; Williams *et al.* 2007; Arnot 2008). Failure to fulfil the obligations intrinsic to social license can result in increased litigation, increased regulations and increasing consumer demands all of which can limit the success of industries (Arnot, 2008).

Ongoing threats to social license to farm makes exploring the animal welfare concerns of the community important to ensure the sustainability of the livestock industry. Given public perceptions change over time and livestock animal welfare issues are salient, it is important to measure current community concerns and to monitor changes in public attitudes and behaviour over time. In 2000, only 3% of Australians disapproved of the common sheep management practice of mulesing, however by 2006 the disapproval of mulesing had grown to 39% (Coleman & Toukhsati, 2006). Coleman *et al.* (2014) suggests that responses by Government in the form of regulation changes, industry responses and media exposure are likely factors underlying these changes in public attitudes, and as such it is therefore important to both measure current community concerns and to monitor changes in attitude over time.

A greater understanding or knowledge of public perceptions towards the livestock industry and livestock animal welfare can inform the industry of possible changes in practice throughout the supply chain and provide a basis for educating the public where necessary

(Coleman *et al.* 2014). This knowledge will also allow industry and government to align their policies with consumer and community perceptions. Thus, ongoing monitoring of public attitudes, knowledge and behaviours will enable the livestock industries to respond appropriately to community expectations and ensure the ongoing sustainability of the livestock industry.

Previous project (APL Project number 2012/0026)

The previous NAWRDE project, conducted in 2013/2014, aimed to monitor public 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) from all states within Australia were surveyed by telephone. The questionnaire took 30 minutes to complete and covered a number of areas; demographics, questions about animal welfare, knowledge of livestock animals and livestock animal welfare, attitudes towards livestock practices, the livestock industries' impact on the environment and towards specific livestock industry procedures and practices and whether or not participants 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 held positive attitudes towards eating meat, which was reflected by the high meat consumption patterns. The relationships between attitudes and meat consumption were much stronger than previously reported, suggesting that community attitudes are becoming more relevant to meat consumption. 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 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 ($r= 0.15$). These findings suggest that the community is not well informed about livestock farming procedures.

The most trusted sources of information were product labels and information received from friends and family. Animal welfare websites were also well trusted, with the RSPCA being the most common site nominated. Most people were found to 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.

Community behaviour involves taking advantage of situational opportunities to express an attitude through action and is considered less deliberate than lobbying for example (Coleman and Toukhsati, 2006). Despite attitudes to animal welfare being a weak predictor of consumer behaviour, they were strongly related to community behaviours in opposition to the livestock industries. Actual knowledge was not correlated with community behaviours, however perceived knowledge was and 75% of participants engaged in at least one community behaviour in opposition to livestock farming. Speaking to colleagues, family members, or friends and donating money to an animal welfare or animal rights group were the most frequent community 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. Demographics, attitudes related to animal welfare and the livestock industries, knowledge and information seeking 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. There is some evidence which suggests that within the community, these opinion leaders may lead debate on social issues and provide a conduit for information from various sources to reach their social groups (Coleman and Toukhsati, 2006). Opinion leaders were found to be younger than non-leaders and held less positive attitudes and lower trust towards the livestock industries. Perceived knowledge, but not actual knowledge or experience living on farms, differed between self-nominated opinion leaders and non-leaders, with leaders perceiving their knowledge to be greater than non-leaders.

The key recommendations from this study included:

- repeat the survey on a regular basis to track changes in community attitudes and behaviour
- address the discrepancy between the public's perceived and actual knowledge of livestock practices; public education programs should be developed to improve community knowledge of livestock practices
- there appears to be a high level of mistrust of off-farm animal workers to care for their animals properly, including those involved in animal transportation (land and sea), abattoirs etc
- the RSPCA appears to have an important role as a source of information for the public and as such a means of engaging the organisation as well as other animal welfare organisations in ongoing discussions of welfare issues needs to be established

- the characteristics and role of opinion leaders need to be investigated further
- ongoing monitoring of community attitudes, knowledge and behaviours is important to enable the livestock industries to respond appropriately to community expectations

The present project (NAWRDE No. 2018/0014), building upon and addressing key recommendations from the earlier study (APL Project number 2012/0026), aims to monitor community attitudes to animal welfare in the Australian livestock industries, including the pork, broiler, kangaroo, feral goat, red meat, abattoir and live export sectors. The developed questionnaire will also permit ongoing monitoring (and benchmarking over time) of public attitudes and knowledge as well as consumer and community behaviours relating to livestock management practices and animal welfare in the Australian livestock industries. The information obtained from these surveys could permit:

- Identification of current trends in public attitudes towards livestock practices and animal welfare in the different livestock industries
- Identification of where the public is misinformed and therefore what industry response is required
- An increased understanding of the knowledge and motivations of opinion leaders who seek to influence others in regard to the livestock industries and animal welfare within these industries
- The development of education strategies to appropriately inform the community of animal use and animal welfare within the industries
- Identification of public concerns that may require changes to industry practices
- Identification of public concerns that can be used for marketing purposes
- Identification of public concerns that can be used to direct animal welfare research

The present project's objectives are as follows:

- I. Adapt the questionnaire used in the previous NAWRDE project, APL Project number 2012/0026 monitor trends in public attitudes (and sources of knowledge) relating to animal welfare in the primary industry sector
- II. To provide both generic and industry-specific information on current trends in public attitudes to and knowledge of welfare issues in the livestock industries

Methods

Questionnaire development

The present project developed (updated) a questionnaire capable of being used in an ongoing capacity to monitor public attitudes, knowledge and behaviour relating to animal welfare in the primary industry sector. The original questionnaire (Appendix A) was adapted using an iterative process that began with a review of the relevant literature published since the previous project in 2013/2014 and a review of the outcomes from the previous project (APL Project number 2012/0026), specifically the variables found to be predictive of community behaviour and meat consumption (identified based on both correlational analyses and stepwise multiple regression analyses). These reviews allowed the research team to begin to adapt the questionnaire by identifying questionnaire items for retention, removal and addition. The outcomes of these reviews were reported in an advisory committee briefing document which was discussed with key industry and research representatives at an advisory committee meeting. The draft questionnaire was finalised on the basis of feedback obtained from the advisory committee (including identification of industry priorities and recommended questionnaire modifications), as well as feedback obtained from piloting the questionnaire with a small sample of participants. The final questionnaire took 35 minutes to complete by telephone and consisted of 134 items divided into five sections (Appendix B).

Section A – Questions about you and your family

This section contains 11 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 34 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 30 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.

Questionnaire delivery: data collection

I-View, a specialised market and social research data collection agency, were contracted to deliver the questionnaire to the general public using random telephone recruitment (Computer Assisted Telephone Interview, CATI) of 500 participants. CATI involved dialling random fixed-line and mobile telephone numbers and inviting potential participants to complete the questionnaire by telephone; individuals were 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 each call, the consultant requested the youngest male over the age of 18 years in the household as preference in order to counteract the expected bias for older female participants. Data collection commenced on the 25th of March and was completed on the 18th of April 2019.

A total of 501 participants (243 females, 258 males) were recruited from all States and Territories of Australia.

Data analysis

Data analysis was completed using SPSS 25.0 (SPSS Inc., Chicago, Illinois, USA). Data analysis included the identification of composite variables for analysis (attitude and trust questionnaire data were analysed using Principal Components Analysis (PCA)), calculation of knowledge scores, determination of opinion leaders, and correlation analyses to examine relationships between public attitudes, knowledge, perceived knowledge and behaviour (consumer and community).

Results

Demographic characteristics

The gender distribution of respondents in both samples was similar and not statistically significant ($\chi^2_1=0.50$, $p=0.48$), as presented in Table 1. Both survey samples are consistent with the population as reported by the Australian Bureau of Statistics (2016), with males representing 49.3% of the population and females 50.7%.

Table 1. Gender Breakdown of Respondents

2013 survey			2019 survey		
	Frequency	Percentage		Frequency	Percentage
Male	228	45.5	Male	258	51.5
Female	251	50.1	Female	243	48.5
Total	479	95.6	Total	501	100.0

Table 2 presents the age distribution of respondents. As can be seen in Table 2, most age ranges were equally represented in both the 2013 and 2019 surveys. Older people (65 years and older) were more highly represented in both surveys (2013: 26.9%; 2019: 19.4%) compared to their proportion of the population as reported by the Australian Bureau of Statistics (2013a). According to the ABS, Australian residents aged 65 years old and over represent 19.79% of the population in 2013, while in 2016 Australian residents aged 65 years old and over made up 14% of the population.

Table 2. Age Distribution of Respondents

2013 survey			2019 survey		
Age bracket	Frequency	Percentage	Age bracket	Frequency	Percentage
18-24	42	8.8	18-24	53	10.6
25-34	80	16.7	25-34	87	17.4
35-44	88	18.4	35-44	97	19.4
45-54	89	18.6	45-54	89	17.8
55-64	83	17.3	55-64	78	15.6
65+	97	20.3	65+	97	19.4
Total	479	100.0	Total	501	100.0

The highest level of education achieved by respondents is presented in Table 3. There was a significant difference between the samples in education, with the 2019 survey having greater tertiary educated respondents and fewer school leaver educated respondents than the 2013 survey ($\chi^2_4=32.92$, $p=.008$). In the 2013 survey, 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. In the 2019 survey, almost half (48.3%) of all respondents had achieved a University or other higher educational institution qualification while a quarter of respondents (24.4%) had achieved a secondary school education. Just under a quarter of the sample (23.4%) had achieved a technical or further education institution (e.g., TAFE College) qualification. It is important to note, that both the 2013 and the 2019 surveys over represents those with a University education. According to the ABS, 22% (24.6% in 2013a) of persons aged between 15 and 64 years reported having achieved a Bachelor degree or above (ABS, 2013b).

Table 3. Education Distribution of Respondents

	2013 survey		2019 survey	
	Frequency	Percentage	Frequency	Percentage
Primary School	19	3.8	11	2.2
Secondary School	142	28.3	122	24.4
Technical or further educational institution (including TAFE College)	114	22.8	117	23.4
University or other higher educational institution	202	40.3	242	48.3
Other educational institution	2	.4	9	1.8
Total	479	95.6	501	100.0

Figure 1 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 1, in both the 2013 and the 2019 surveys the vast majority of respondents live in major cities of Australia with very few respondents living in remote and very remote areas. Further to this most respondents live in New South Wales, Victoria and Queensland. Nonetheless these proportions are reflective of those reported by the ABS (Australian Bureau of Statistics 2012, 2013a).

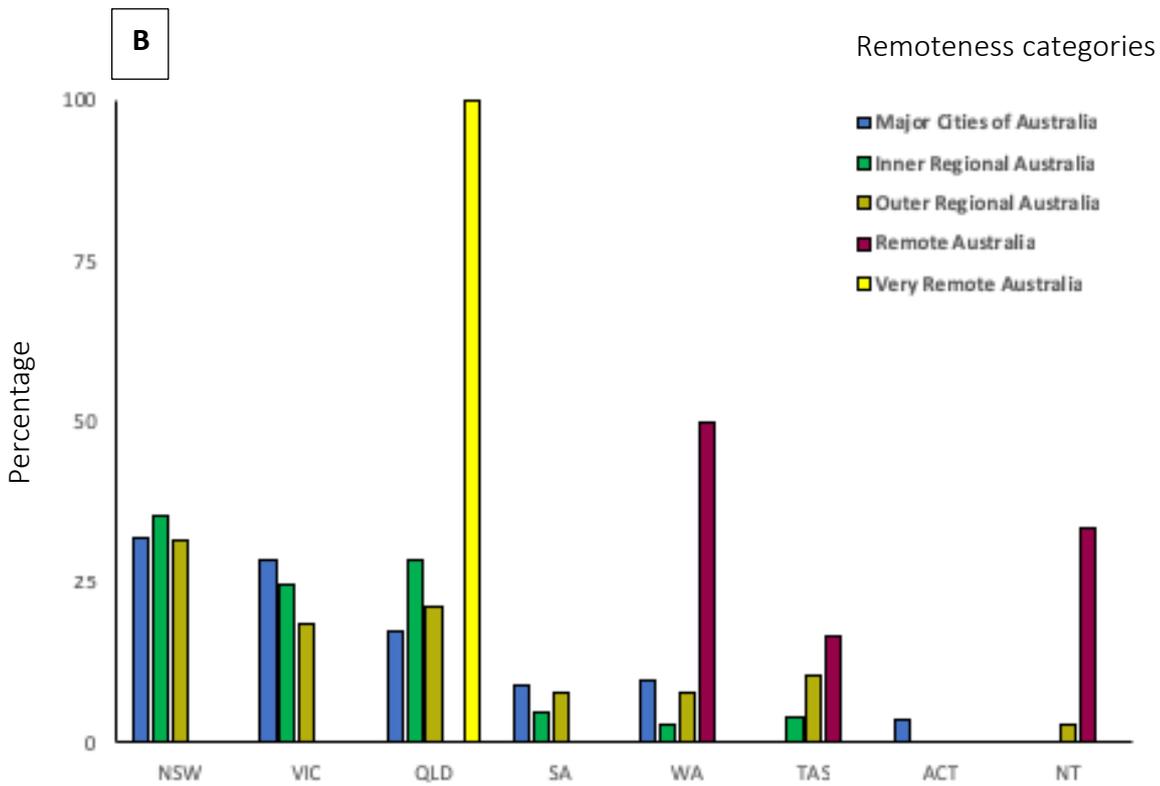
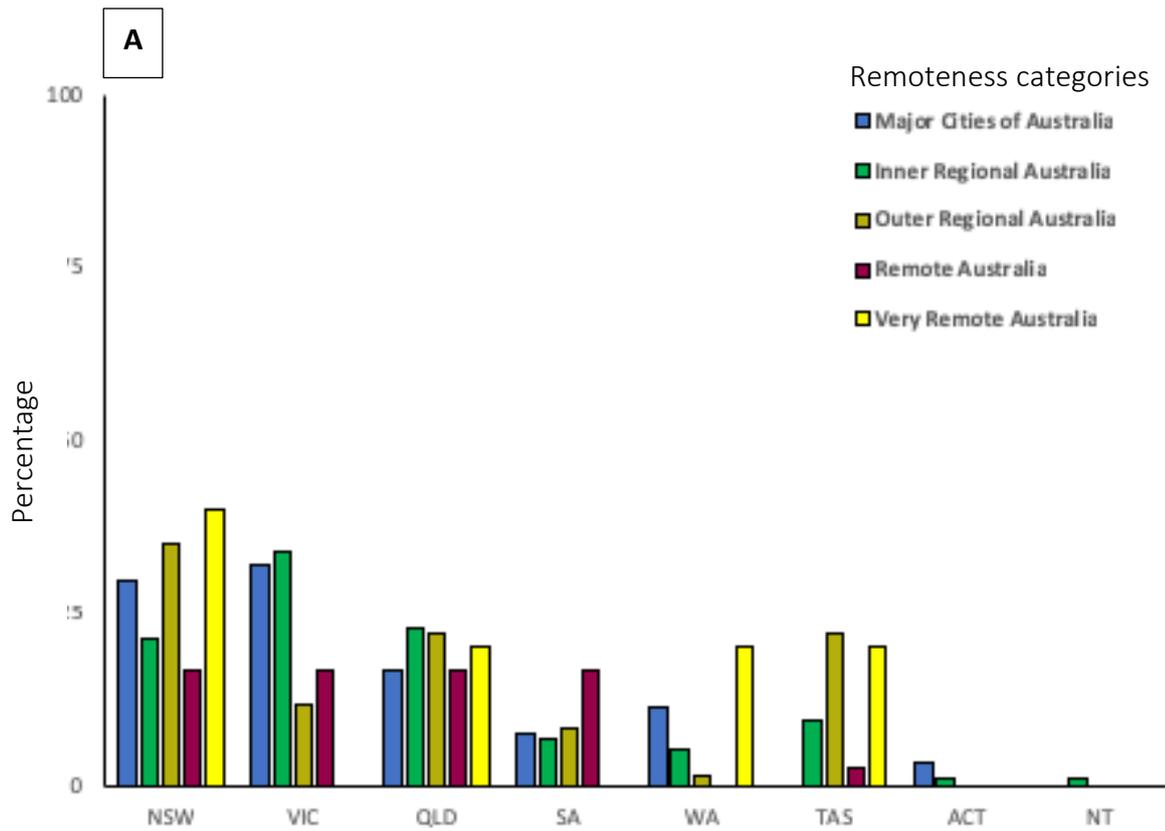


Figure 1. Remoteness as a function of State. (A) 2013 survey data (B) 2019 survey data

Dog ownership was common in both surveys, with almost half of respondents reporting to be living with at least one pet dog; 41.8% of 2013 respondents and 43.3% of 2019 respondents. Cat ownership was less common with approximately a quarter of respondents from both survey samples reportedly living with at least one pet cat; 26.1% of 2013 respondents and 27.9% of 2019 respondents. There was no significant difference between the samples with regard to dog ($\chi^2_1=0.88$, $p=0.35$) or cat ($\chi^2_1=0.17$, $p=0.68$) ownership.

Respondents' understanding of animal welfare

Respondents were asked on a scale from 1 to 5 (1 = Does not describe animal welfare at all (Strongly disagree), 5 = Completely describes animal welfare (Strongly agree)), the extent to which they thought a series of descriptions of animal welfare captured what animal welfare means to them. Table 4 presents the mean level of agreement with these various descriptions for the 2013 and 2019 surveys. As can be seen from Table 4, respondents from both surveys rated all descriptions relatively high with means ranging from 3.88 ($SD= 1.48$) and 3.66 ($SD= 1.23$) for 'Balancing the needs of animals and people' to 4.59 ($SD=0.92$) and 4.58 ($SD=0.88$) 'Preventing animal cruelty'. The correlation between the means for the two samples was 0.92 (rank order correlation .82), indicating that they were quite stable over time and that the order of agreement with the various definitions remained fairly stable.

Table 4. Level of agreement with animal welfare descriptions

	2013	2019
Humane treatment of animals	4.46	4.54
Caring for our pets	4.54	4.46
Livestock farmers and handlers using best practice	4.41	4.10
Preventing animal cruelty	4.59	4.58
Protecting the rights of animals	4.27	4.20
Livestock farmers and handlers caring for their animals	4.39	4.14
Balancing the needs of animals and people	3.88	3.66

Animal welfare perceptions and acceptability of animal uses

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 5). In both surveys, 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, however, the acceptability of all uses had reduced in the 2019 survey when compared with the 2013 survey. The difference between the two samples with regard to the acceptability of the different animal uses was not statistically different.

Table 5. Respondents’ Level of Acceptability of Animal Uses

	2013 survey		2019 survey		
	Mean	Standard deviation	Mean	Standard deviation	
Companions (pets)	4.68	0.69	Companions (pets)	4.61	0.74
Food	4.10	1.11	Food	3.78	1.25
Clothing	3.18	1.48	Clothing	2.98	1.50
Research	2.44	1.30	Research	2.38	1.30
Sport and entertainment	2.12	1.16	Sport and entertainment	2.06	1.25

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

Table 6 and Figure 3 present respondents’ perception of the welfare of livestock animals. Welfare ratings were measured on a 5-point Likert-type scale (1 = Very poor, 5 = Very good). Ranking of respondents’ perceptions of welfare were similar across both surveys ($R_s=.96$), with laying hens believed to have the poorest welfare. Dairy cows and sheep produced for wool, on the other hand were perceived as having moderately good welfare.

Table 6. Respondents’ Perception of the Welfare of Livestock Animals

	2013 survey		2019 survey		
	Mean	Standard deviation	Mean	Standard deviation	
Laying hens	2.64	1.20	Laying hens	2.83	1.50
Pigs	3.00	1.33	Pigs	3.12	1.39
Goats (meat)	3.12	1.50	Goats (meat)	3.53	1.70
Sheep (meat)	3.58	1.23	Sheep (meat)	3.52	1.26
Beef	3.72	1.14	Beef	3.59	1.22
Dairy cows	3.95	1.05	Dairy cows	3.78	1.26
Sheep (wool)	4.08	1.03	Sheep (wool)	3.92	1.10

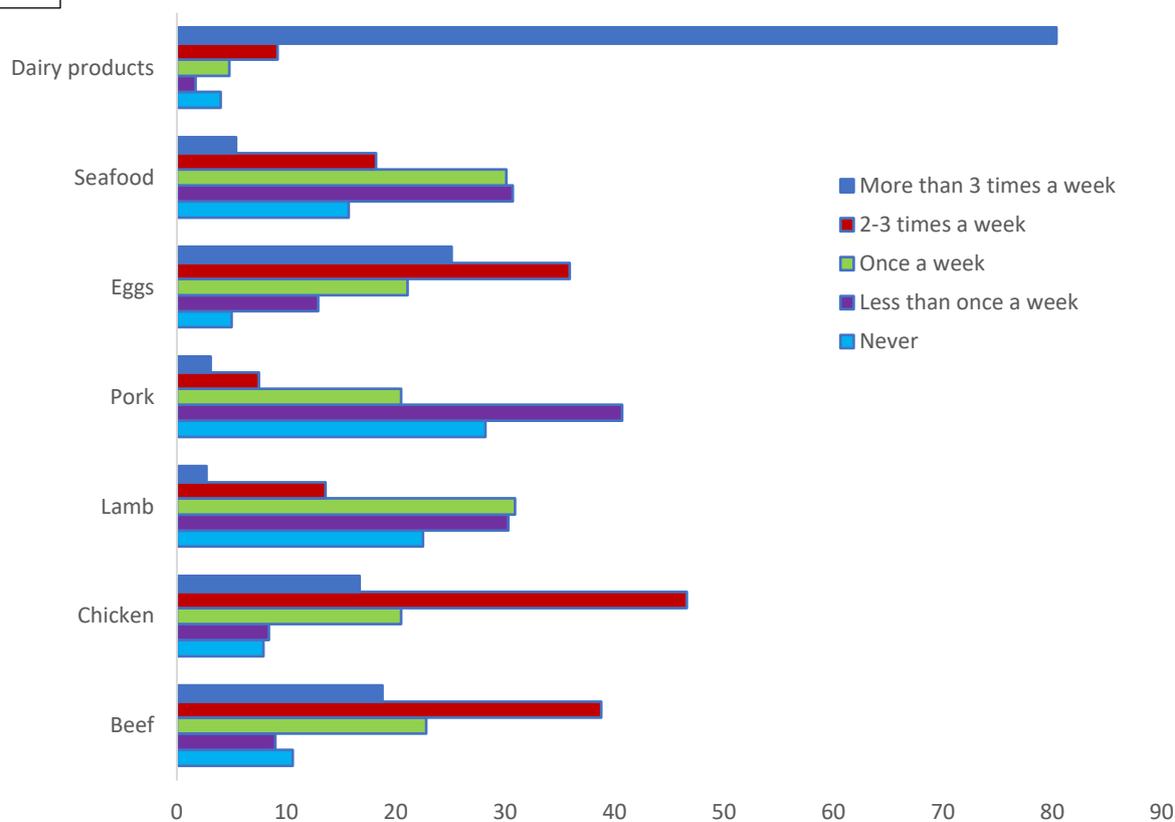
Note. Scale ranged from 1 to 5 (1= very poor, 5 = very good)

The dietary habits of respondents are presented in Table 7. In both the 2013 and 2019 surveys, the majority of respondents are meat and vegetable eaters (91.4% and 88.4%, respectively). While very few respondents reported to be vegetarian or vegan in both surveys, the percentage of vegan respondents increased from 0.6% in 2013 to 3.8% in 2019. The difference between the two samples with regard to dietary habits of respondents was not statistically different.

Table 7. Dietary Habits of Respondents

	2013 survey		2019 survey	
	Frequency	Percentage	Frequency	Percentage
Meat and vegetable eater	438	91.4	443	88.4
Vegetarian	35	7.3	33	6.6
Vegan	3	0.6	19	3.8
Other	3	0.6	6	1.2
Total	479	100.0	501	100.0

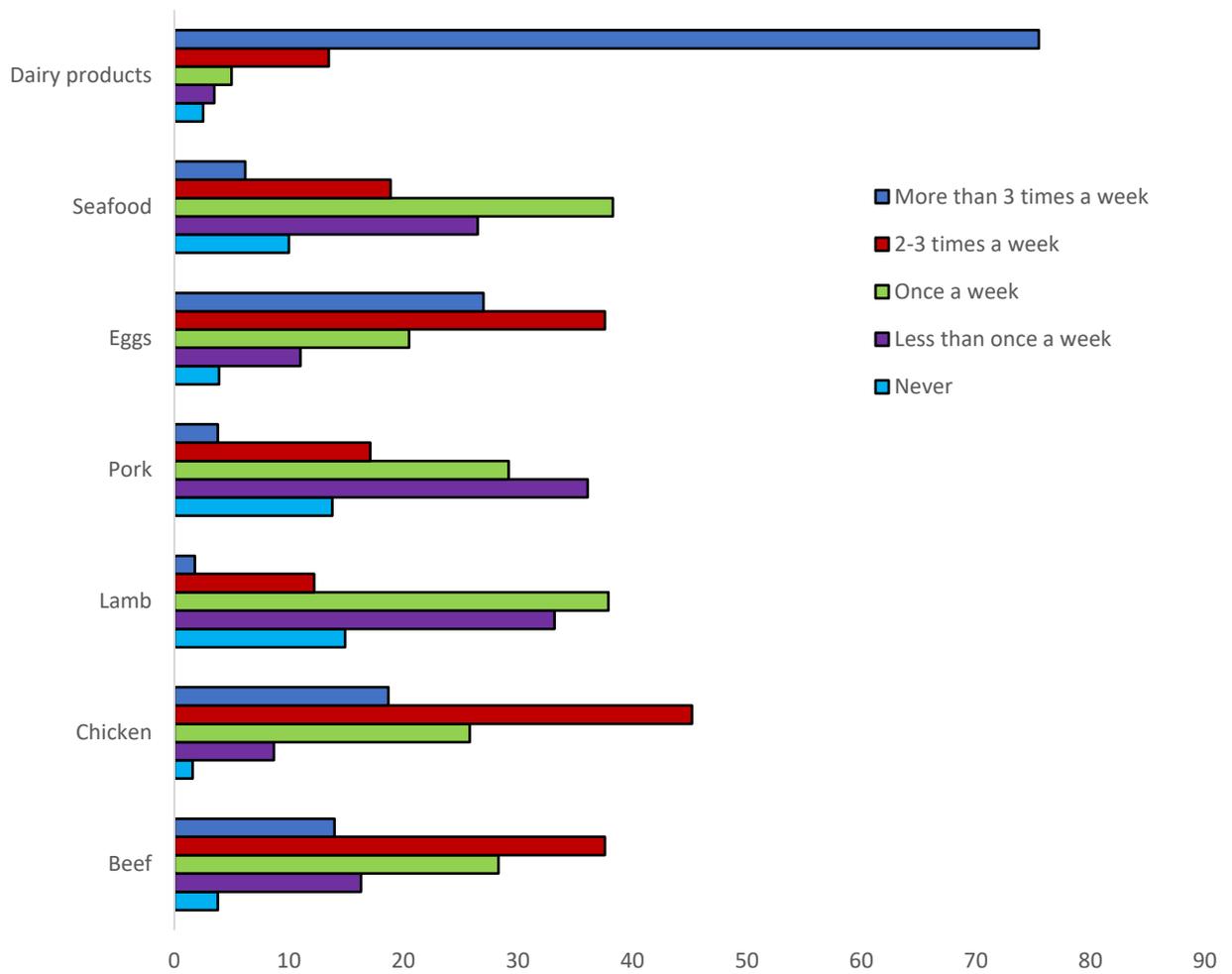
A



	Beef	Chicken	Lamb	Pork	Eggs	Seafood	Dairy products
More than 3 times a week	18.8	16.7	2.7	3.1	25.1	5.4	80.4
2-3 times a week	38.8	46.6	13.6	7.5	35.9	18.2	9.2
Once a week	22.8	20.5	30.9	20.5	21.1	30.1	4.8
Less than once a week	9	8.4	30.3	40.7	12.9	30.7	1.7
Never	10.6	7.9	22.5	28.2	5	15.7	4

Figure 2 (A). Percentages of weekly consumption of animal products from 2013 survey

B



	Beef	Chicken	Lamb	Pork	Eggs	Seafood	Dairy products
More than 3 times a week	14	18.7	1.8	3.8	27	6.2	75.5
2-3 times a week	37.6	45.2	12.2	17.1	37.6	18.9	13.5
Once a week	28.3	25.8	37.9	29.2	20.5	38.3	5
Less than once a week	16.3	8.7	33.2	36.1	11	26.5	3.5
Never	3.8	1.6	14.9	13.8	3.9	10	2.5

Figure 2 (B). Percentages of weekly consumption of animal products from 2019 survey

Figures 2A and 2B present the average weekly consumption of animal products, from the 2013 and the 2019 surveys respectively, the outcomes of which were similar across surveys.

In the 2019 survey, the most frequently eaten animal products were dairy products, with three quarters of respondents (75.5%) reporting eating dairy foods more than 3 times a week. Eggs were also frequently eaten with over a quarter (27.0%) of respondents reporting that they ate eggs more than 3 times a week. Pork and lamb were least frequently eaten, with more than a third respondents (36.1% and 33.2%) reporting that they ate these meats less than once a week, and 13.8% and 14.9% of respondents reporting that they never ate these meats. There was no statistical difference between the two samples with regard to average weekly consumption of the different animal products.

Animal welfare attitudes and trust variables

As was the case for the 2013 sample, 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. The results of these PCAs were compared to the 2019 sample to ensure that the scale structures had remained stable across the samples so that the quantitative results from the two samples could be compared.

Scale reliabilities were measured using Cronbach α coefficients with an $\alpha \geq 0.70$ as the criterion for acceptable reliability (DeVellis 2003a; DeVellis 2003b). Items were included in a scale if their loading on the relevant component exceeded 0.33 (Tabachnick and 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 and Fidell 2012).

Attitudes towards livestock animal welfare

The 2019 scale loaded on one factor and explained 41.64% of the variance compared to 41.27% in the 2013 sample. The scale structure was the same for the 2013 and the 2019 survey data. It 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 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 3, 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. As was the case for the 2013 data, most of the respondents disagreed or neither agreed nor disagreed with the statement (Strongly disagree = 38.5%, Disagree = 20.6%, Neither agree nor disagree = 24.2%), over 20% of respondents strongly agreed or agreed with the statement (Strongly agree = 7.4%, Agree = 9.4%). These figures are almost identical to the 2013 results.

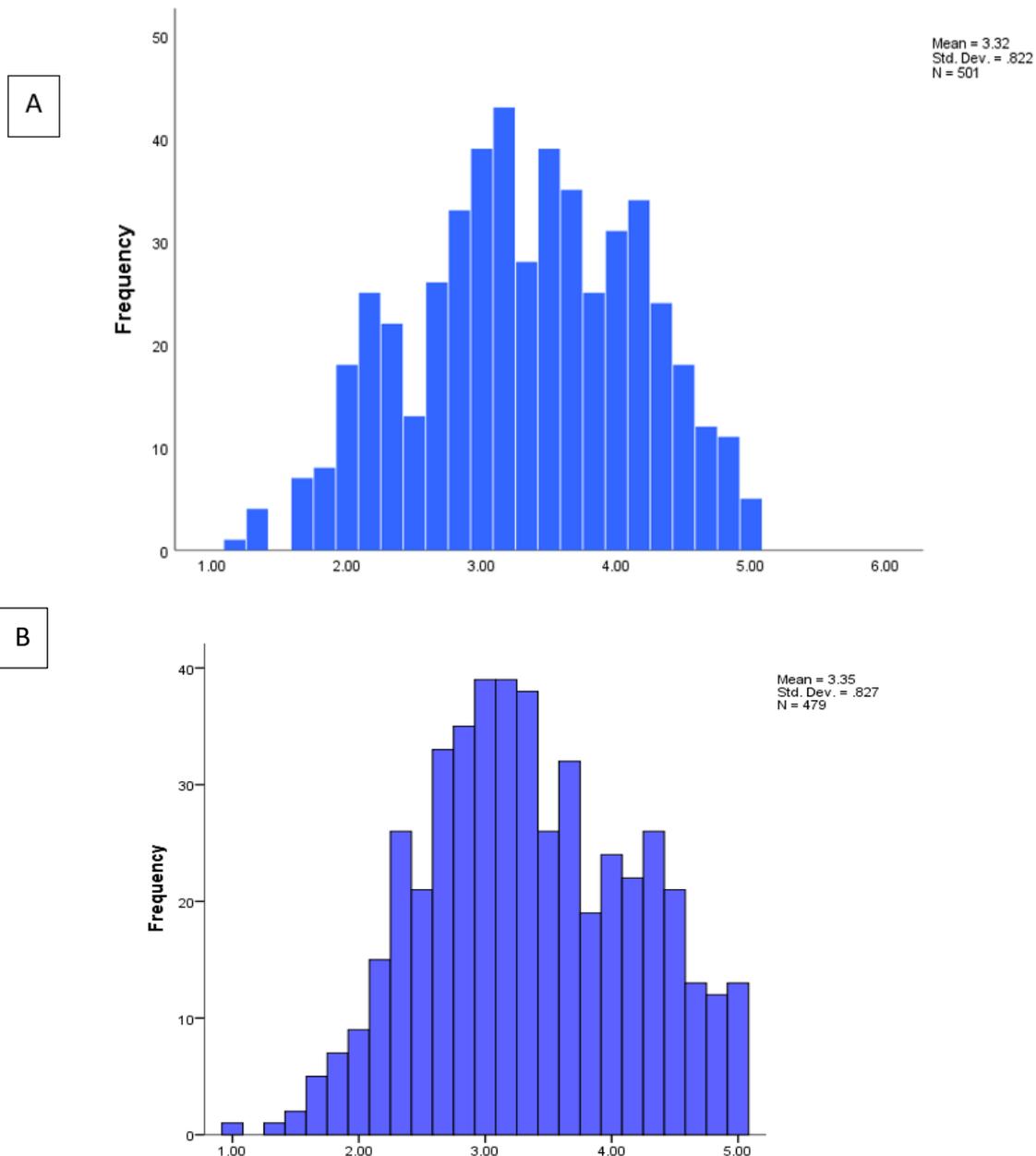


Figure 3. Attitudes towards livestock animal welfare with high score = positive attitude. (A) 2019 survey data-Cronbach’s alpha= 0.79. (B) 2013 survey data- Cronbach’s alpha= 0.71

Attitudes towards animals as a source of food

PCAs revealed the presence of two factors explaining 74.04% (71.07% in the 2013 data) 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” (2019 data: $M=3.61$, $SD=1.37$; 2013 data: $M=3.55$, $SD=1.31$) and “Australian livestock farmers deserve better prices and purchase conditions from supermarkets” (2019 data: $M=4.30$, $SD=1.06$; 2013 data: $M=4.48$, $SD=0.87$) were left as single items. All items were measured on a 5-point scale (1=Strongly disagree, 5=Strongly agree).

Figure 4 presents the distribution of respondents to the ‘Attitudes towards eating meat’ subscale for both samples. ‘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 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 5, the distributions of responses are negatively skewed with most respondents holding positive attitudes towards eating meat. The distributions are similar for both samples with similar means also.

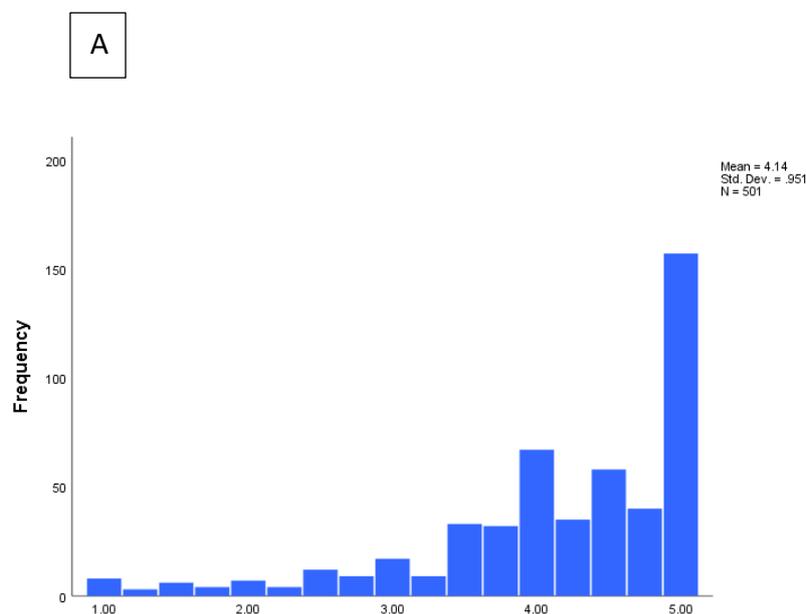


Figure 4A. Attitude towards eating meat, with high score = positive attitude. 2013 survey data-Cronbach’s alpha=0.85

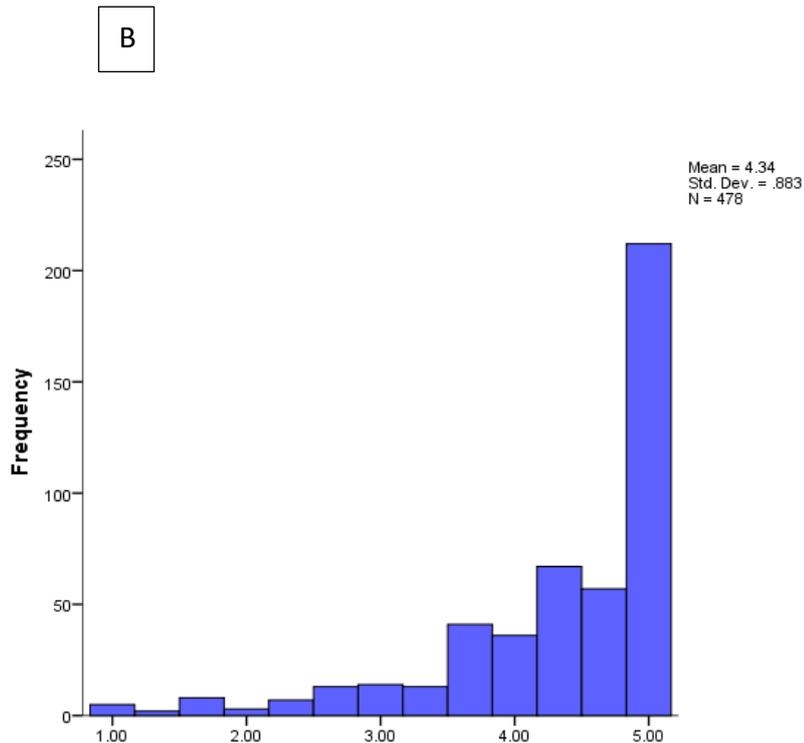


Figure 4B. Attitude towards eating meat, with high score = positive attitude. (2019 survey data-Cronbach’s alpha = 0.83).

Beliefs about Australian animal welfare standards

PCA confirmed the existence of one factor explaining 52.02% (2013 sample: 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 5, respondents were equally divided in their attitudes towards the Australian livestock industries. Upon inspection, it can be seen that 52.9% (2013 sample: 52%) of respondents hold negative attitudes and this was not different from the 2013 sample.

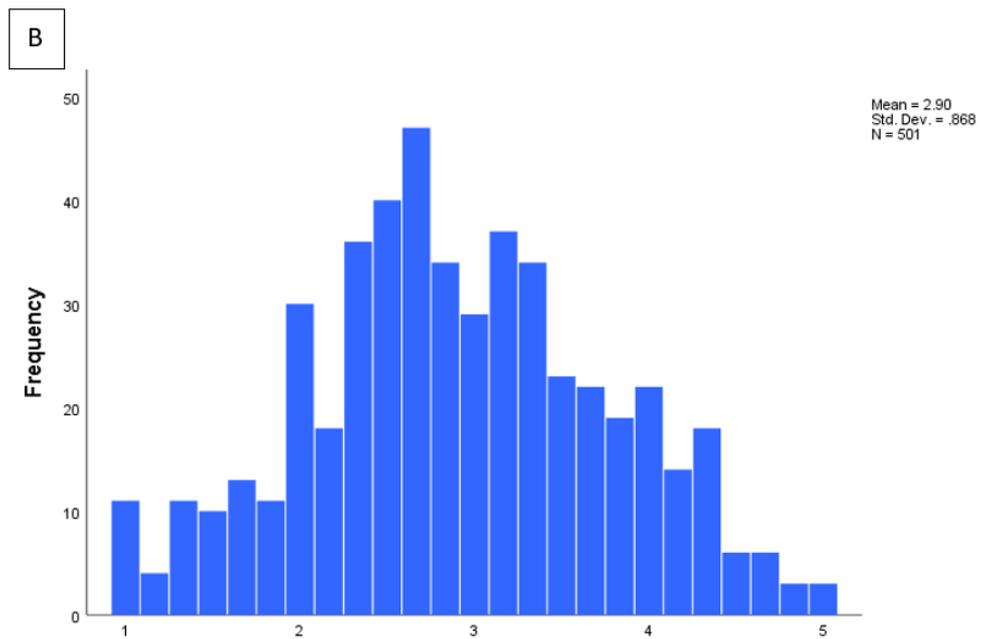
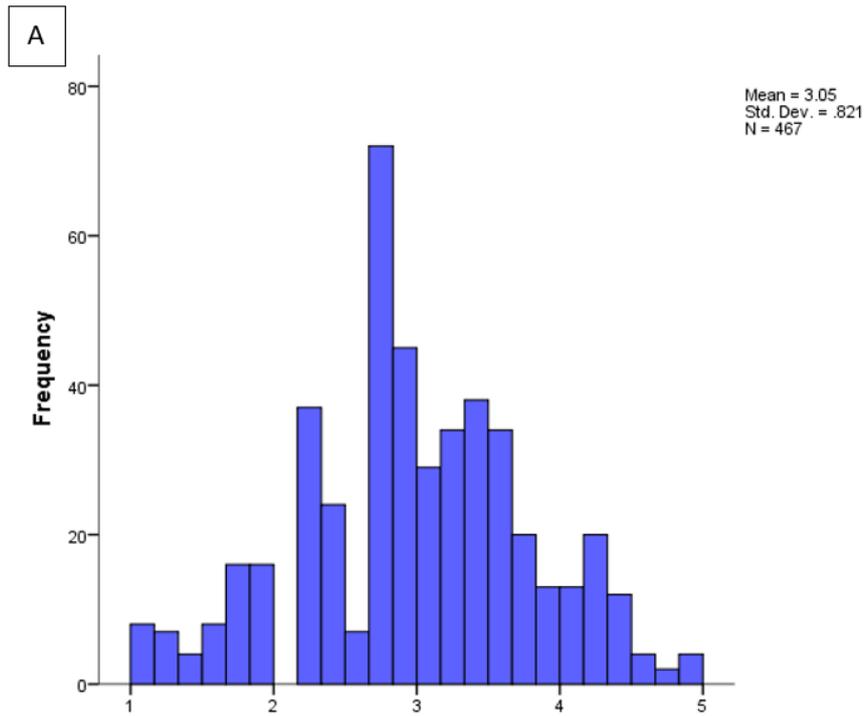


Figure 5. Beliefs about welfare standards in the Australian livestock industries with high score = positive attitude. (A) 2019 survey data- Cronbach's alpha = 0.74 (B) 2013 survey data- Cronbach's alpha = 0.80

Perceived negative impact of the Australian livestock industries on the environment

PCA confirmed the presence of one factor explaining 52.60% (2013: 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 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 6, the distribution of responses is reasonably symmetrical. 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. These results are similar to those for the 2013 sample.

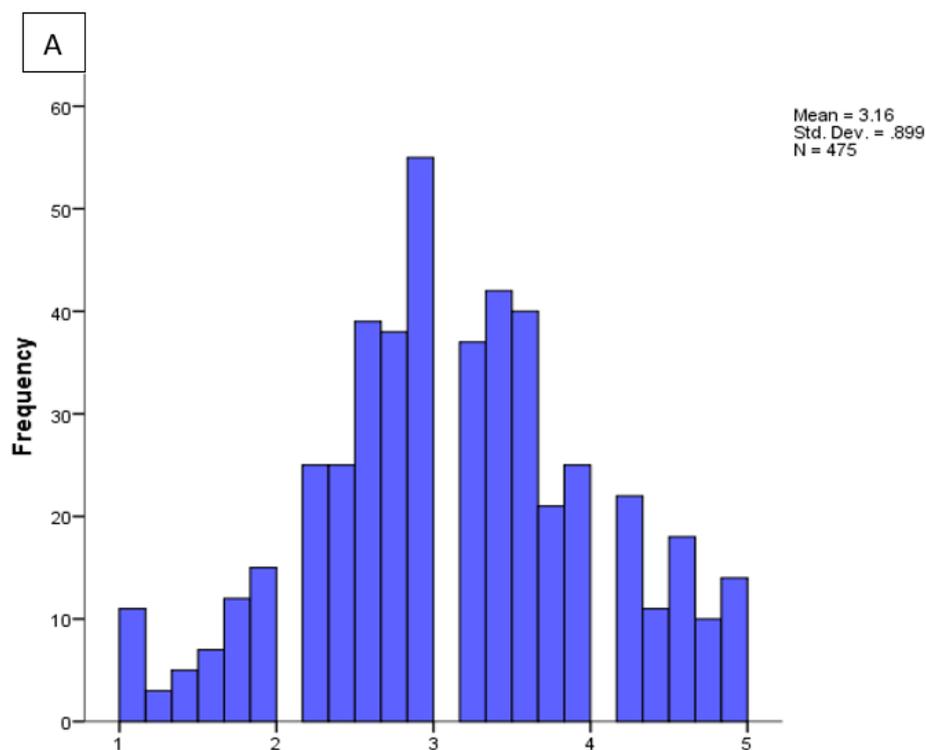


Figure 6A. Perceived negative impact of the Australian livestock industries on the environment with high score = positive attitude. 2013 survey data- Cronbach's alpha = 0.77

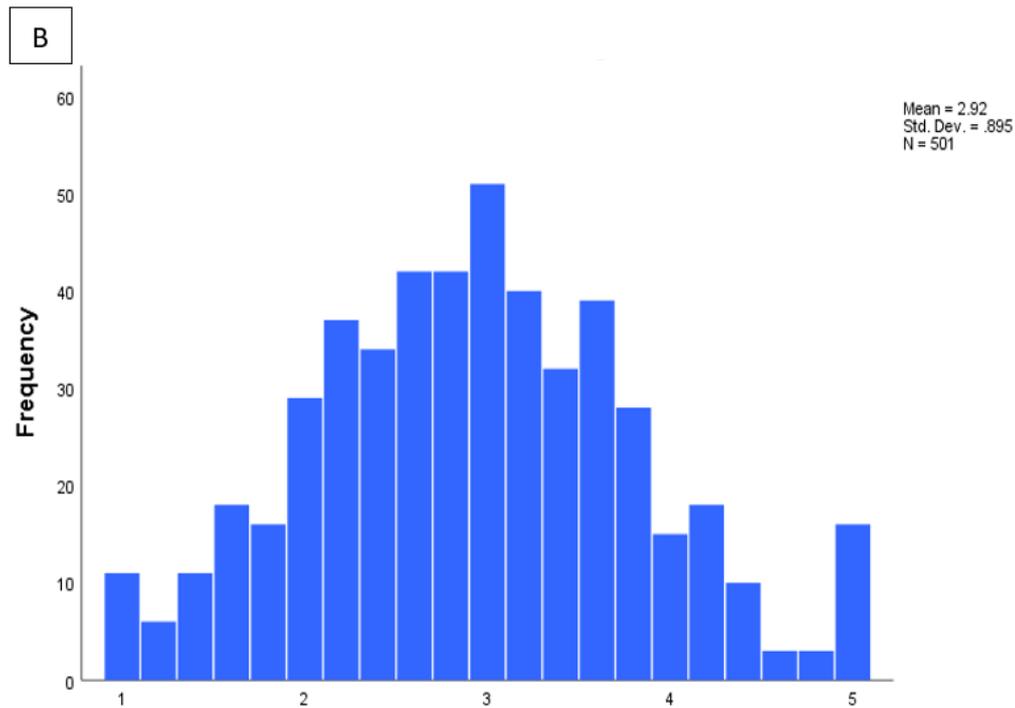


Figure 6B. Perceived negative impact of the Australian livestock industries on the environment with high score = positive attitude. 2019 survey data- Cronbach's alpha = 0.77

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 71.87% (2013: 72.77%) of the variance in trust. This result is similar to the 2013 sample. As can be seen in Figure 7, there is some variability in the participants’ responses to this scale. Although 38% (2013: 26.8%) of the sample of respondents reported low trust, the majority report high trust. However, trust had declined between the two samples ($t_{974}=4.17, p<.01$).

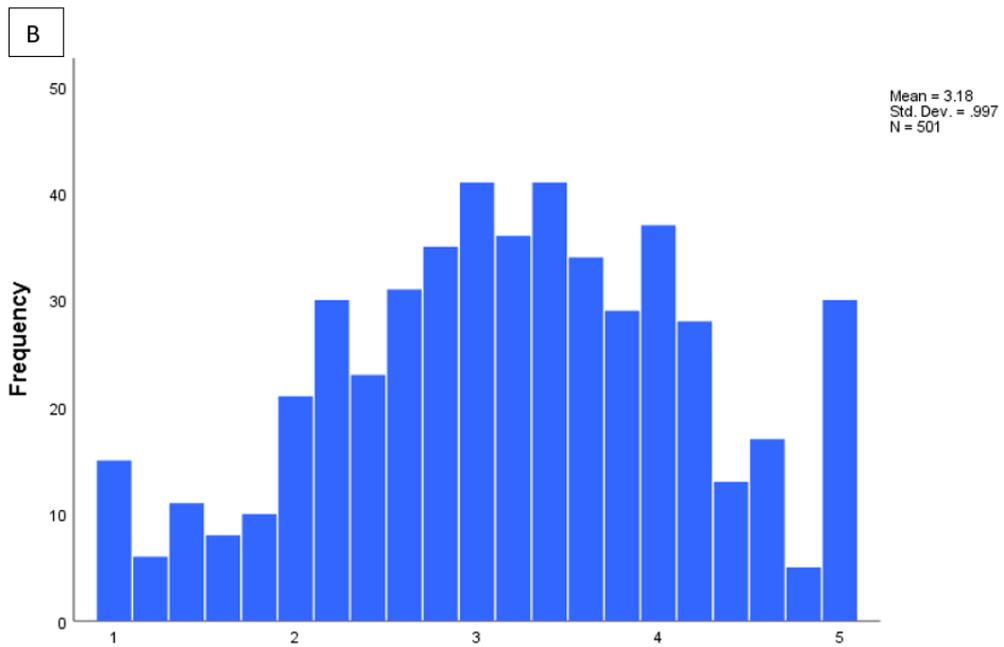
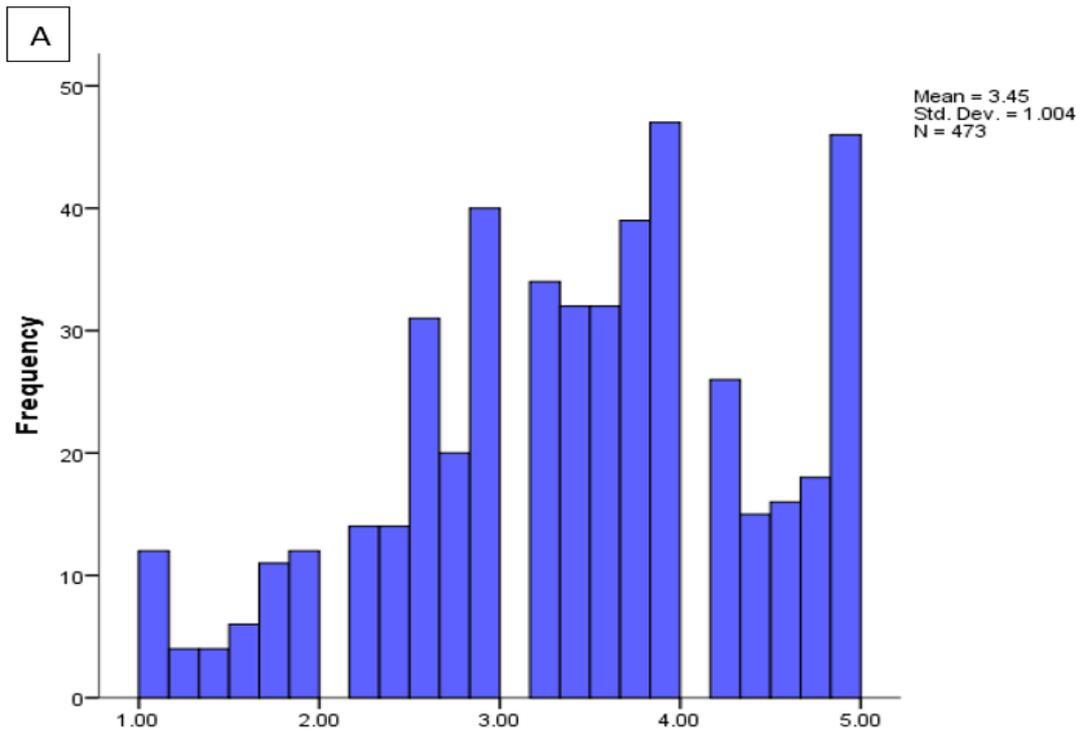


Figure 7. Trust in people involved in the Australian livestock industries with high score = high trust. (A) 2013 survey data- Cronbach's alpha = 0.90 (B) 2019 survey data- Cronbach's alpha = 0.90

Frequency distributions in the level of trust of people working in different parts 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 71.6% (2013: 72.1%) of respondents reporting trust in farmers and only 8.4% of respondents in both samples reporting low levels of trust in farmers. These results are similar for both samples. In contrast, respondents reported the least amount of trust in people responsible for transporting livestock animals by sea. In the 2019 sample, 18.8% of respondents reported trust in these people (2013: 36.4%), 57.5% (2013: 40.9%) reported low levels of trust. This indicates a substantial decrease in trust compared with the 2013 data. Levels of trust were somewhat higher for those transporting animals by land than by sea. Approximately 40% (2013: reported high levels of trust in land transporters but 32.0% of respondents (2013: 23.7%) reported low trust. However, this still represents a decrease in trust for the two samples. A similar trend was found for abattoir workers with 37.6% of all respondents (2013: 49.5%) reporting high levels of trust in abattoir workers with 31.4% (2013: 23.0%) of respondents reporting low trust in abattoir workers.

Table 8. Distributions of Levels of Trust in People involved in the Australian Livestock Industries. Shaded rows = 2013 sample, clear rows = 2019 sample.

	Low trust			High trust	
Farmers	3.8	4.6	19.5	37.4	34.7
	3.2	5.2	21.0	36.9	33.7
Abattoir workers	8.1	14.9	27.6	28.9	20.6
	13.0	18.4	31.1	23.8	13.8
Animal handlers	5.5	8.3	25.1	38.6	22.5
	7.6	10.8	29.9	32.3	19.4
People transporting livestock animals by sea	18.8	22.1	22.7	20.1	16.3
	33.9	23.6	23.8	10.8	8.0
People transporting livestock animals by land	9.3	14.4	30.7	26.6	19.0
	11.6	20.4	28.5	23.6	16.0

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 38.80% (2013: 42.52%) of the variance. As can be seen in Figure 8, respondents were divided in their levels of trust with approximately 48% (2013: 47%) of respondents scoring below the midpoint of 3. Overall, trust declined over the two samples ($t_{976}=4.59, p<.01$).

The distribution of levels of trust across the various sources are displayed in Table 9. 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). While most levels of trust were similar for the two samples, trust in animal welfare related sites decreased markedly in the 2019 survey (in red in Table 9).

Table 9. Distributions of Level of Trust in Sources of Livestock Animal Welfare Information
Shaded rows = 2013 sample, clear rows = 2019 sample.

	Low trust			High trust	
Social media	24.3	28.1	33.0	13.0	1.6
	26.1	24.4	37.5	9.0	3.0
Print media	7.8	13.0	50.9	23.9	4.4
	8.4	15.4	42.1	29.3	4.8
Radio	6.2	16.6	48.3	23.4	5.5
	13.4	23.0	44.3	15.8	3.6
Television	7.3	13.8	47.3	25.5	6.1
	9.8	14.4	40.3	28.9	6.6
Animal welfare related websites	14.1	10.5	26.2	29.6	19.5
	15.4	22.2	44.5	13.6	4.4
Friends, relatives or colleagues	4.6	12.4	38.1	32.4	12.4
	5.8	10.8	38.9	33.3	11.2
Product labels	6.6	8.9	34.9	37.4	12.3

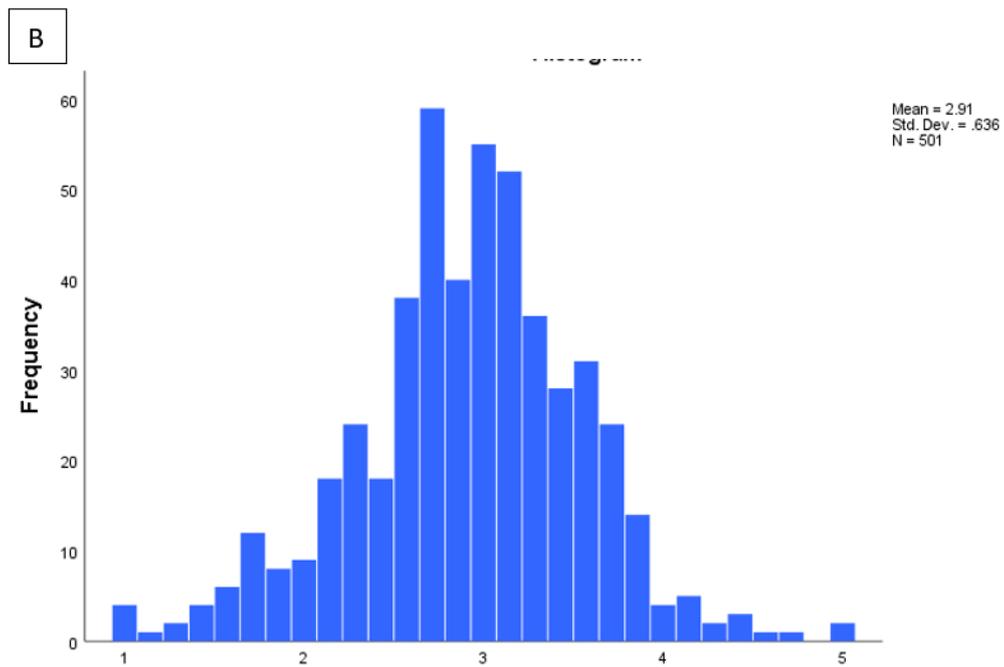
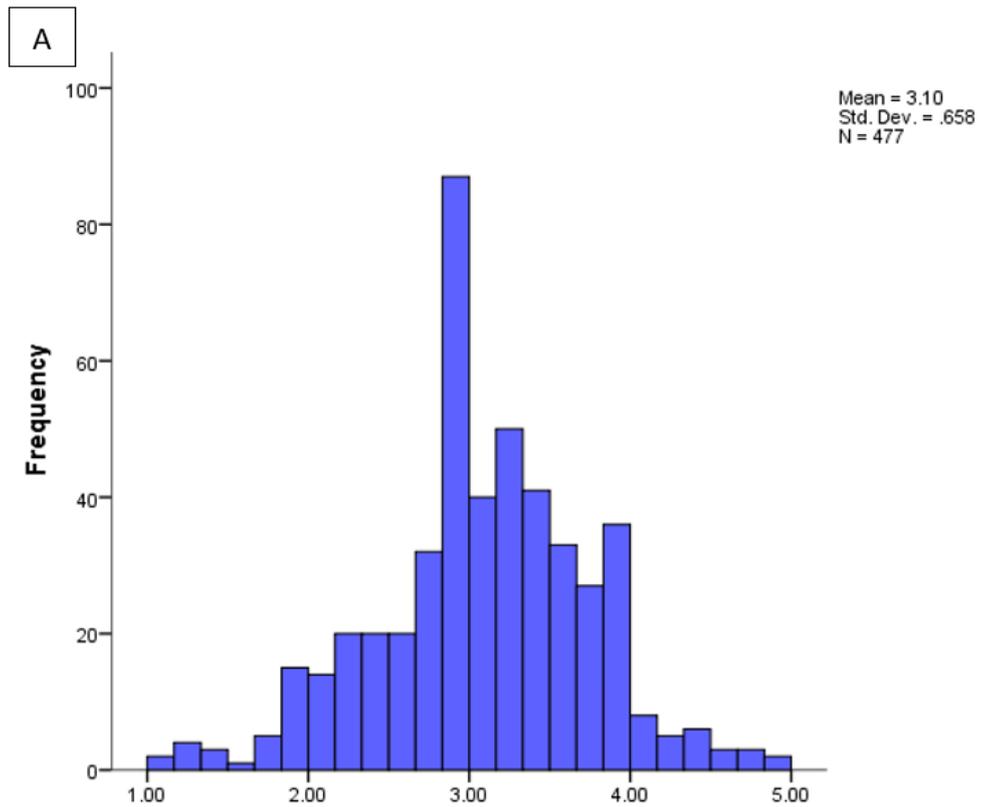


Figure 8. Level of trust in sources of livestock animal welfare information with high score = positive trust. (A) 2013 survey data- Cronbach's alpha = 0.75 (B) 2019 survey data- Cronbach's alpha = 0.73

Knowledge

PCA confirmed the presence of one factor explaining 66.78% (2013: 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, few respondents claim to know a lot about any of the listed industries. In particular, respondents claimed to know least about the pork industry and sheep meat industries. In comparison, respondents felt that they knew the most about the egg industry. For example, only 7.2% (2013: 12.3%) of respondents reported that they knew nothing at all about the egg industry. No consistent change between the 2013 and 2019 samples was evident.

Table 10. Distributions of Perceived Knowledge of Livestock Industries (2019: n=501, Cronbach's alpha = 0.87 ; 2013: n=479, Cronbach's alpha=0.86). Shaded rows = 2013 sample, clear rows = 2019 sample.

	Nothing at all (%)	Very little	A little bit	A moderate amount	A lot (%)
Pork	23.8	35.7	22.5	12.5	5.4
	14.4	31.9	31.3	16.2	6.2
Sheep (meat)	15.4	31.3	30.7	15.7	6.9
	12.8	25.9	29.7	20.0	11.6
Sheep (wool)	14.0	26.7	26.9	24.0	8.4
	11.8	17.8	30.7	24.8	15.0
Beef	11.3	25.1	32.4	22.8	8.6
	7.0	21.6	33.3	25.7	12.4
Egg	12.3	23.8	32.2	22.3	9.4
	7.2	21.2	33.5	27.1	11.0

Actual knowledge was assessed by asking respondents to correctly identify 9 livestock-related 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 eight questions. Figure 9 shows that the number of questions answered correctly ranged from one to 8. Of all the 8 knowledge questions, most participants (73.5%) answered between six and nine questions correctly out of eleven. Overall knowledge was lower in the 2019 sample compared to the 2013 sample ($t_{978}=6.73$, $p<.01$).

As can be seen in Table 11 the most well-known practices tail docking (2019: 79.8%; 2013: 77.7%) and feed lotting (2019: 73.9%; 2013: 72.0%) Knowledge of free rang chickens declined markedly between the two samples. (2019: 41.7%; 2013: 77.7%), The least well-known procedures were those relating to slaughter. These were Halal meat (2019: 26.5%; 2013: 26.6%) pre-slaughter stunning (2019: 46.15%; 2013: 51.1%) and Kosher meat (2019: 42.9%;

2013: 53.0%). Respondents scored no better than chance on knowledge of mulesing (2019: 50.5%; 2013: 61.8%).

Table 11. Knowledge of Livestock Practices. Shaded rows = 2013 sample, clear rows = 2019 sample.

	% Correct	% Don't know ^a
Halal meat – in Australia, production of Halal approved meat typically involves a reversible method of stunning	26.7	13.6
	26.5	0.0
Pre-slaughter stunning – renders an animal unconscious immediately prior to stunning	51.1	6.7
	46.1	0.0
Kosher meat – in Australia, Kosher approved meat typically comes from animals that have not undergone any method of stunning	53.0	17.3
	42.9	0.2
Crutching – shearing of wool around the rear end of the sheep	58.7	6.3
	53.9	0.0
Mulesing – cutting and removal of skin around the rear end of a sheep	61.8	9.2
	50.5	0.0
Feedlotting – fattening animals in a relatively small enclosure	72.0	4.4
	73.9	0.0
Tail docking – removal of a tail	77.7	4.2
	79.8	0.0
Free-range chickens – chickens that have access to an outdoor area as they please	77.7	0.8
	41.7	0.0

Note: ^a Don't know options were classified as incorrect

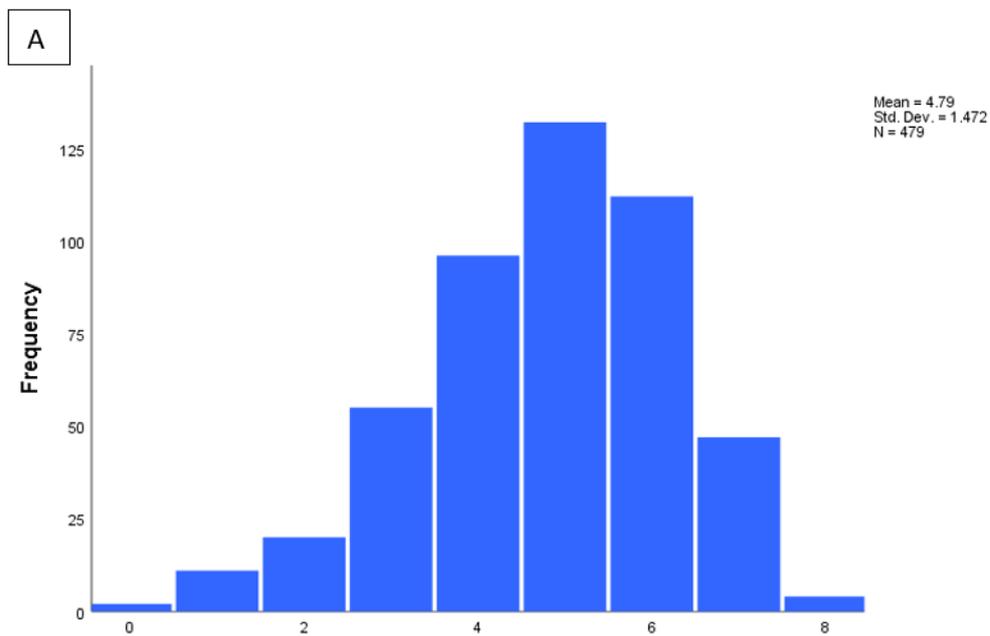


Figure 9A. Number of knowledge of livestock practices questions answered correctly. 2013 survey data.

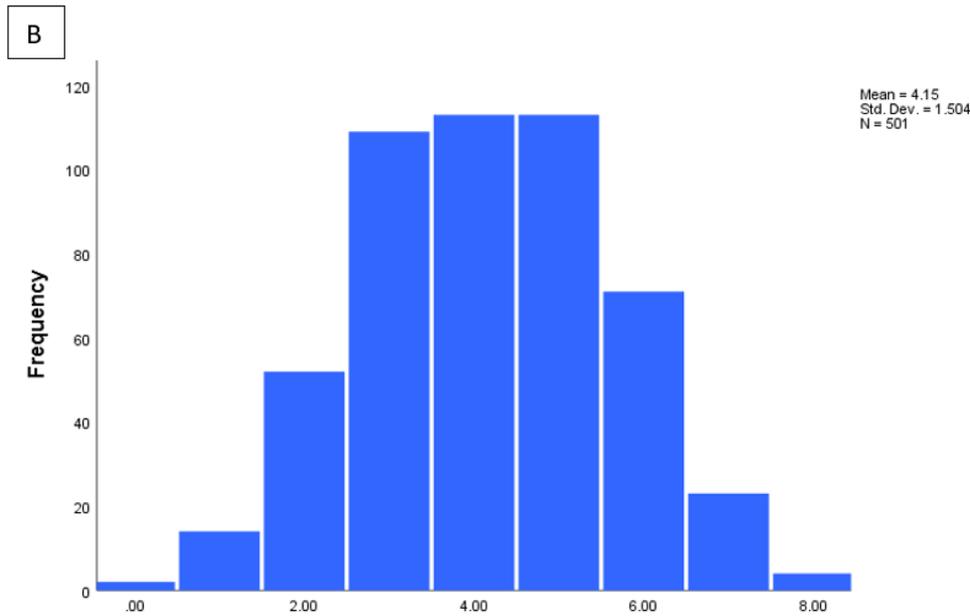


Figure 9B. Number of knowledge of livestock practices questions answered correctly. 2019 survey data.

Although significant, the correlation between perceived knowledge and actual knowledge was quite low (2019: $r=0.28$, $p < 0.01$; 2013: $r=0.15$, $p < 0.05$). This correlation had increased between the two samples.

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=20.6%, Strongly approve=68.7%) and euthanasia of sick/injured/dying animals (Approve=15.2%, Strongly approve=73.7%). These results are very similar to the 2013 results. The most highly disapproved livestock practices were confinement (Strongly disapprove =43.1%, Disapprove=26.1%), and live sheep and cattle sea transport (Strongly disapprove=40.9%, Disapprove=16.8%). These were more highly disapproved of in the 2019 sample compared with the 2013 data, particularly sea transport of live sheep and cattle.

Table 12. Distribution of Respondents' Approval of Livestock Practices (Cronbach's alpha= 2019:0.83, 2013: 0.88). Shaded rows = 2013 sample, clear rows = 2019 sample.

	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
	1.99	43.1	26.1	22.4	5.0	3.4	
Hot iron branding	2.59	40.1	25.2	23.1	14.2	11.5	1.7
	N/A	N/A	N/A	N/A	N/A	N/A	
Live sheep and cattle <u>sea</u> transport	2.59	30.9	16.7	25.6	15.9	10.8	1.5
	2.29	40.9	16.8	23.2	10.4	8.8	
Feed-lotting animals	2.73	21.5	20.4	31.1	17.9	9.1	7.9
	1.81	19.4	22.2	36.3	13.4	8.8	
Clipping teeth	2.75	21.7	17.5	36.1	13.8	11.0	10.4
	N/A	N/A	N/A	N/A	N/A	N/A	
Tail docking	2.76	24.8	20.1	23.5	16.8	14.7	3.3
	2.83	25.3	14.8	27.5	16.4	16.0	
Mulesing	2.85	20.4	17.2	31.7	17.7	12.9	22.3
	2.82	18.6	14.6	43.1	13.8	10.0	
Kosher meat	2.96	15.8	16.4	36.6	18.4	12.7	19.6
	3.06	13.0	13.2	44.1	14.8	15.0	
Curfew	2.97	9.5	13.9	56.9	9.5	10.2	38.4
	N/A	N/A	N/A	N/A	N/A	N/A	
Halal meat	2.98	18.2	11.3	39.9	15.3	15.3	15.2
	2.85	24.4	12.6	32.1	15.6	15.4	
De-horning	3.04	18.9	15.9	26.8	19.5	18.9	2.7
		N/A	N/A	N/A	N/A	N/A	
Castration	3.22	16.2	12.8	26.2	22.1	22.7	3.5
	3.16	16.4	10.6	33.1	20.2	19.8	
Crutching	3.44	10.5	14.5	24.3	21.7	29.0	12.3
	3.34	10.4	12.2	35.7	16.4	25.3	
Live sheep and cattle ground transport	3.52	6.1	10.6	32.6	26.8	23.9	1.3
	3.36	10.2	12.2	30.3	26.3	21.0	
Pre-slaughter stunning	3.89	7.4	6.6	17.5	26.6	41.9	4.4
	3.74	8.4	8.4	22.4	22.6	38.3	
Euthanasia of sick/injured/dying animals	4.52	2.7	1.5	6.1	20.0	69.6	1.0
	4.56	2.0	2.0	7.2	15.2	73.7	
Free range	4.57	1.3	1.7	6.5	20.0	70.5	.8
	4.54	1.2	1.4	8.2	20.6	68.7	

Note: ^a Don't know responses for the 2013 data were deleted from the frequency distributions. Shaded rows are 2013 data.

Importance of husbandry and natural living attributes to the welfare of livestock animals

Table 13 presents 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).

As can be seen from Table 13, all attributes with the exception of individual housing and social contact with different species were regarded as important. Little change was seen between the two samples.

Table 13. Distribution of Respondents' Level of Importance of housing and husbandry Attributes to the Well-being of Livestock Animals. Shaded rows = 2013 sample, clear rows = 2019 sample.

	Mean	Not at all important			Very important	
Medications	4.43	0.6	2.5	12.2	22.6	62.0
	4.36	2.4	2.8	12.2	22.0	60.7
Vaccinations	4.59	0.2	1.7	8.4	18.7	71.1
	4.55	1.0	1.4	7.8	21.0	68.9
Protection from predators	4.70	0.6	1.0	4.6	15.7	78.1
	N/A	N/A	N/A	N/A	N/A	N/A
Good waste disposal	4.72	0.6	0.8	3.2	16.8	78.5
	4.73	0.6	0.6	4.2	14.2	80.4
Regular exercise	4.74	0.2	0.0	3.3	18.2	78.2
	4.69	0.4	0.8	4.4	18.2	76.2
Good nutrition	4.85	0.2	0.2	1.3	10.9	87.5
	4.84	0.2	0.2	0.6	13.0	86.0
Good ventilation	4.86	0.0	0.0	1.9	10.5	87.6
	4.85	0.2	0.0	2.2	9.6	88.0
Individual housing	3.04	11.9	17.9	38.4	18.5	13.4
	N/A	N/A	N/A	N/A	N/A	N/A
Social contact with different species	3.10	11.0	17.8	37.6	17.6	15.9
	N/A	N/A	N/A	N/A	N/A	N/A
Outdoor housing	4.21	3.0	1.9	15.6	30.7	48.8
	N/A	N/A	N/A	N/A	N/A	N/A
Contact with offspring	4.38	1.5	2.9	12.0	23.1	60.5
	4.34	2.2	4.0	13.0	19.2	61.7
Social contact with the same species	4.44	0.8	1.7	9.6	28.1	59.7
	4.62	0.2	1.2	6.0	21.4	71.3
Freedom to roam outdoors	4.62	0.6	1.9	5.2	19.9	72.4
	4.65	0.2	1.2	6.2	18.2	74.3

Community behaviours

Figure 10 presents the number of activities respondents have engaged in to express their dissatisfaction in the relation to the way animals are treated in Australia’s livestock industries. In both samples, three quarters of the sample engaged in at least one of the nine activities to express their dissatisfaction. Table 14 shows that many of the behaviours have increased in prevalence since the 2013 survey ($t_{978}=3.65$, $p<.01$). The most common community behaviours were talking to colleagues, family members or friends (2019:68.1%; 2013: 55.3%), donating money to an animal welfare organisation (2019 54.5%; 2013: 46.6%), or signing a petition (2019: 46.7%; 2013: 36.3%).

Table 14. Types of Activities Engaged in by Respondents in order to Express Dissatisfaction

	2013	2019
Spoken to colleagues, family members, or friends	55.3	69.1
Donated money to animal welfare organisations ^a	46.6	54.5
Signed a petition	36.3	46.7
Shared or liked a page on a networking site (e.g., Facebook)	25.7	N/A
Volunteered your services to animal welfare organisations ^a	11.7	16.8
Written a letter to a politician	9.4	11.8
Written a letter to a newspaper	4.0	3.8
Contributed to an online collaborative project (e.g., Wikipedia)	3.8	N/A
Posted a video or other media to a content community (e.g., Youtube) ^b	3.8	N/A
Called a radio talk back segment	7.5	2.4
Written a blog (e.g., Twitter)	1.5	N/A
Created a group on a networking site (e.g., Facebook)	1.3	N/A
Social media activities ^b	N/A	40.3

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

^b Social media activities were collapsed into one category for the 2019 sample.

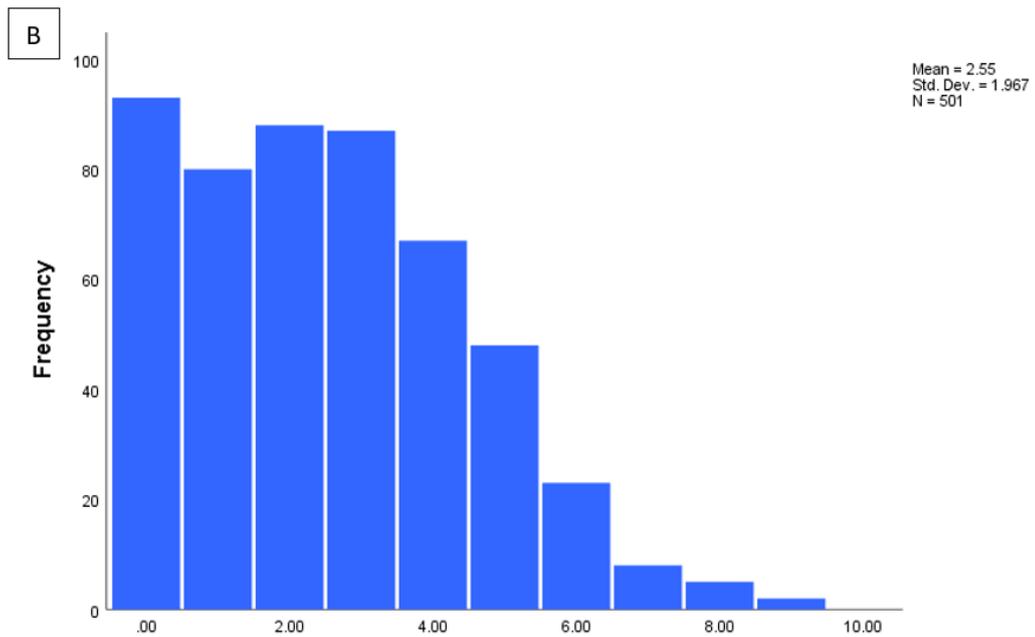
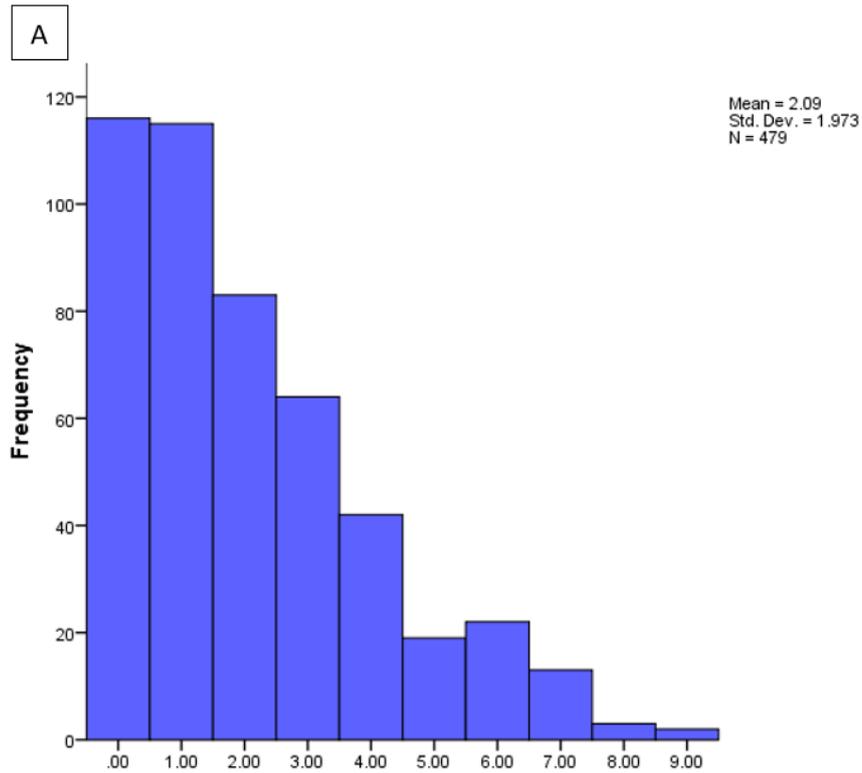


Figure 10. Number of community behaviours engaged in by respondents. (A) 2013 survey data (B) 2019 survey data.

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 11-A and Figure 11-B, for the 2013 (M = 2.1, SD = 1.07) and 2019 (M = 2.5, SD = 1.08) samples respectively. In both samples, most respondents scored less than 3 indicating that very few respondents consider themselves to be opinion leaders in the area of livestock animal welfare. However, there appears to be a broader distribution of the data in the 2019 sample when compared with the 2013 sample. In the 2019 sample, opinion leaders are LESS active on the first two questions. It is only question 3 that is in the expected direction. However, question 3 has a predictor importance of 1.0, while the others have .48 (“how many people have you told about farm animal welfare in Australia”) and .21 (“how likely are you to be asked about farm animal welfare in Australia”). This indicates that it is question 3 that is driving the separation of the two groups. Thus, in the 2019 data, an opinion leader is characterised as a person who reports being used frequently as a source of advice on farm animal welfare in Australia.

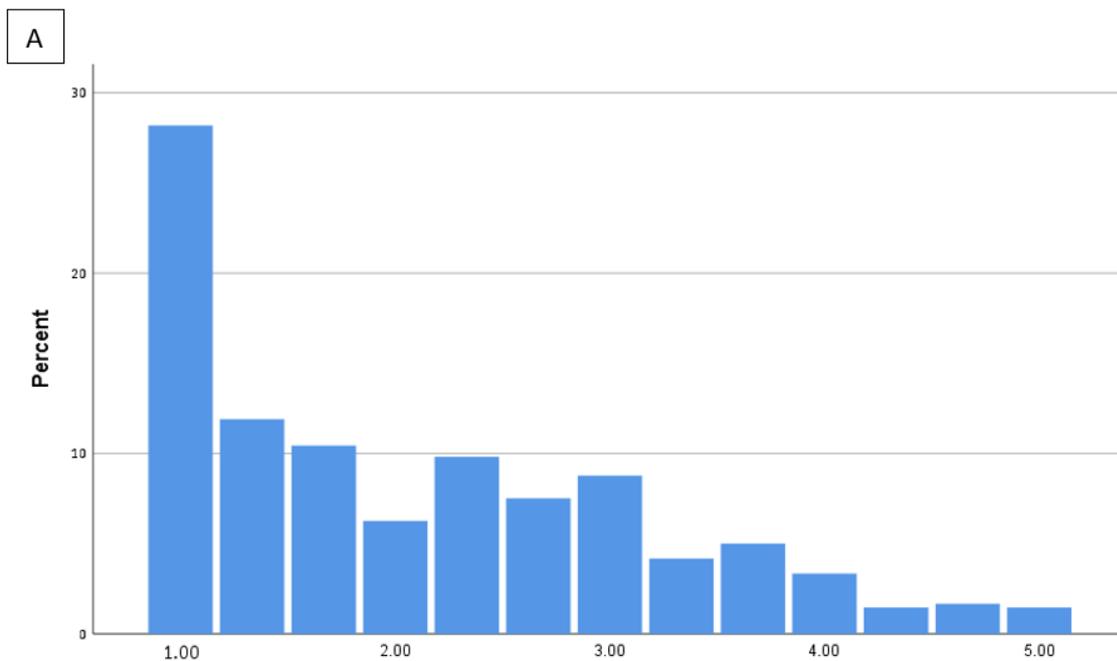


Figure 11A. Distribution of the opinion leadership scale 2013 survey data

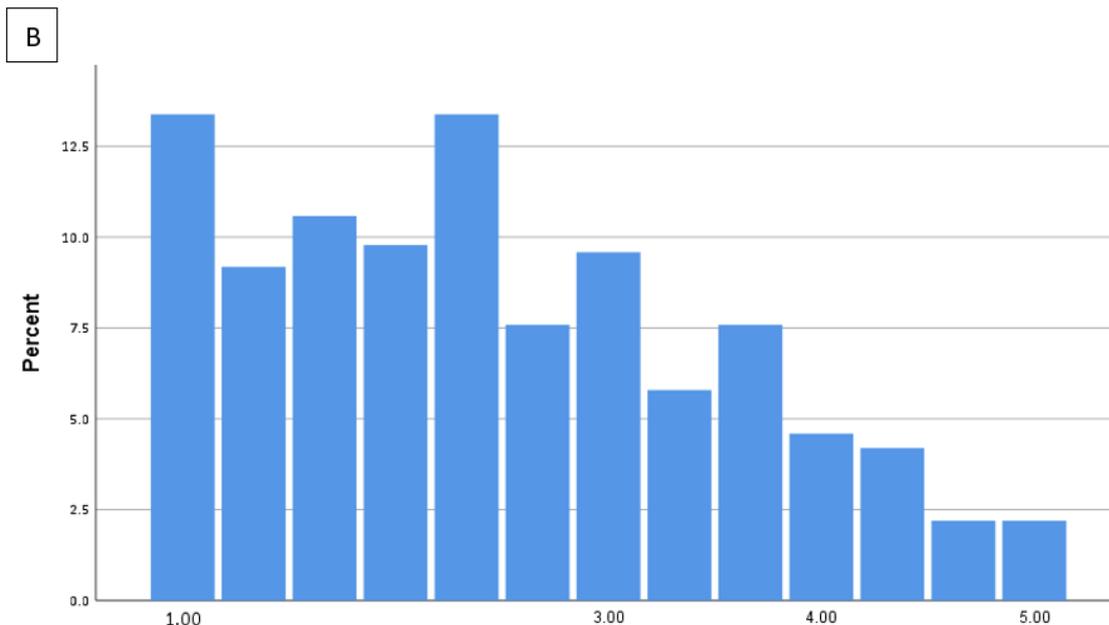


Figure 11B. Distribution of the opinion leadership scale. 2019 survey data.

These items were used in a two-step cluster analysis to identify the respondents who could be classified as opinion leaders (Table 15). For the 2013 sample, this resulted in 15% of respondents being identified as opinion leaders (Silhouette measure of cohesion and separation = 0.55 (good)). For the 2019 sample, 7% of respondents were identified as opinion leaders (Silhouette measure of cohesion and separation = 0.3 (fair)).

Table 15. Group means for the two clusters identified using 2-step cluster analysis. Shaded rows = 2013 sample, clear rows = 2019 sample.

		During the past six months, how many people have you told about farm animal welfare in Australia?				Overall, in all of your discussions with friends and neighbours how often are you used as a source of advice on farm animal welfare in Australia?	
				Compared with your friends, how likely are you to be asked about farm animal welfare in Australia?			
		Mean	S.D.	Mean	S.D.	Mean	S.D.
2013	Non-leaders	1.92	1.21	1.76	0.97	1.60	0.85
	Opinion leaders	4.03	1.09	4.12	0.86	3.80	1.02
2019	Non-leaders	2.64	1.48	2.39	1.29	2.44	1.12
	Opinion leaders	1.32	.85	1.68	1.13	3.97	.90

A comparison between opinion leader and non-leaders showed that opinion leaders generally expressed more concern about and more positive attitudes towards animal welfare, more concern about welfare in the livestock industries, reported higher perceived knowledge but not actual knowledge, reported engaging in more community behaviours and in accessing more information about animal welfare, and were younger (Table 16). These findings were consistent across both the 2013 and 2019 surveys. In the 2013 survey, opinion leaders were generally vegetarian or vegan, reported more negative attitudes towards eating meat, greater concern about the welfare standards in the Australian livestock industries, and more positive beliefs about husbandry and natural living attributes in the Australian livestock industries. In the 2019 survey opinion leaders tended to have a higher level of education, less trust in the people involved in the Australian livestock industries, more negative attitudes towards eating meat, perceive the impact of the Australian livestock industries on the environment to be negative and report lower approval of livestock practices.

Table 16. Comparisons of Opinion Leaders and Non-leaders on Demographics, Attitudes, Knowledge and Behaviour. Shaded rows = 2013 sample, clear rows = 2019 sample.

	t	df	Sig.	Mean Non leaders-Leaders
Gender	.562	477	.574	.036
Gender	.664	499	.507	.057
Age	-2.438	477	.015	-.446
Age	-2.378	499	.018	-.662
Eating habits	2.437	477	.015	.116
Eating habits	1.758	499	.079	.163
Level of education	-.939	477	.348	-.112
Level of education	2.933	499	.004	.454
Attitude toward livestock animal welfare	3.749	477	.000	.386
	1.957	499	.051	.274
Attitude towards eating meat	-3.375	477	.001	-.323
	-3.047	499	.001	-.491
Beliefs about welfare standards in the Australian livestock industries	-2.613	477	.009	-.274
Beliefs about welfare standards in the Australian livestock industries	-3.601	499	.000	-.528
Trust in the people involved in Australian livestock industries	-1.765	475	.078	-.223
Trust in the people involved in Australian livestock industries	-5.199	499	.000	-.863
Welfare ratings	-2.366	477	.018	-.271
Welfare ratings	-3.832	499	.000	-.685
Perceived knowledge	6.259	477	.000	.700

Table 16 cont. Comparisons of Opinion Leaders and Non-leaders on Demographics, Attitudes, Knowledge and Behaviour. Shaded rows = 2013 sample, clear rows = 2019 sample.

	t	df	Sig.	Mean Non leaders-Leaders
Perceived knowledge	-3.936	499	.000	-.660
Knowledge of livestock practices	.237	477	.813	.044
Knowledge of livestock practices	-.262	499	.793	-.06751
Perceived negative impact of the Australian livestock industries on the environment	-.927	477	.354	-.105
Perceived negative impact of the Australian livestock industries on the environment	-4.214	499	.000	-.634
Approval of livestock practices	-1.551	477	.122	-.139
Approval of livestock practices	-2.885	499	.004	-.336
Trust in information	3.671	477	.000	.301
Trust in information	1.062	499	.289	.121
Husbandry attributes	2.374	477	.018	.145
Husbandry attributes	.114	499	.909	.010
Natural living attributes	2.519	477	.012	.154
Natural living attributes	1.967	499	.050	.172
Community behaviour	7.535	477	.000	1.44
Community behaviour	2.737	499	.006	.914

Predicting community and consumer behaviour

Correlation analyses were undertaken to identify variables associated with community and consumption behaviours. Table 17 displays these relationships. As can be seen in Table 17, 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 (2019: $r = .19$; 2013: $r = .24$). Younger respondents engaged in a higher number of community behaviours than older respondents, respondents with lower levels of education engaged in a higher number of community behaviours (2019: $r = .09$; 2013: $r = -.10$), than did respondents with higher levels of education, (2019: $r = .08$; 2013: $r = .16$). These results were broadly similar to those from the 2013 sample.

Attitude and trust variables were more strongly correlated with community behaviours. Among these, attitudes towards livestock animal welfare (2019: $r = .45$; 2013: $r = .40$), trust in sources of animal welfare information (2019: $r = .20$; 2013: $r = .32$) and natural living attributes (2019: $r = .31$; 2013: $r = .28$) positively correlated with community behaviours. Attitudes towards eating meat (2019: $r = -.33$; 2013: $r = -.36$), beliefs about welfare standards in the Australian livestock industries (2019: $r = .33$; 2013: $r = -.43$), trust in the people involved in

Australian livestock industries (2019: $r = -.44$; 2013: $r = -.37$), perceived welfare (2019: $r = -.38$; 2013: $r = -.36$), perceived negative impact of the Australian livestock industries on the environment (2019: $r = -.35$; 2013: $r = -.36$) and approval of livestock practices (2019: $r = -.42$; 2013: $r = -.38$) were negatively correlated with community behaviours. Again, these results were strikingly similar to those from 2013.

For both 2013 and 2019, perceived knowledge, but not actual knowledge, of livestock practices was positively correlated with community behaviours (2019: $r = .12$; 2013: $r = .12$), 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 (2019: $r = -.22$; 2013: $r = -.16$, $p < .01$), between pork consumption and gender (2019: $r = -.26$; 2013: $r = -.18$), between lamb consumption and gender (2019: $r = -.13$; 2013: $r = -.07$) and between dairy consumption and gender (2019: $r = -.14$; 2013: $r = -.11$). This means that male respondents consumed these products more often than females.

Older respondents consumed less beef (2019: $r = -.13$; 2013: $r = -.08$) more often than younger respondents and a similar pattern was found for chicken (2019: $r = -.23$; 2013: $r = -.12$), pork (2019: $r = -.10$; 2013: $r = -.04$) seafood products (2019: $r = -.27$; 2013: $r = -.12$) but older respondents consumed more dairy (2019: $r = -.14$). These relationships were stronger in the 2019 sample compared to the 2013 sample.

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 (2019: $r = .29$; 2013: $r = .47$), beliefs about welfare standards in the Australian livestock industries (2019: $r = .33$; 2013: $r = .30$), trust in people involved in the Australian livestock industries (2019: $r = .30$; 2013: $r = .31$), perceived negative impact of the Australian livestock industries on the environment (2019: $r = .28$; 2013: $r = .29$) and approval of livestock practices (2019: $r = .21$; 2013: $r = .36$). Beef consumption was negatively correlated with attitudes towards livestock animal welfare (2019: $r = -.22$; 2013: $r = -.25$) and perceived importance of natural living attributes (2019: $r = -.10$; 2013: $r = -.11$). These relationships were remarkably stable between samples.

Chicken consumption was generally uncorrelated with attitudes and this is a change from the 2013 survey results where a number of small correlations were observed (attitudes towards

livestock animal welfare, attitude towards eating meat, , beliefs about welfare standards in the Australian livestock industries , trust in the people involved in the Australian livestock industries, perceived welfare, perceived negative impact of the Australian livestock industries on the environment and approval of livestock).

The frequency of lamb consumed in an average week was negatively correlated with attitudes towards livestock animal welfare (2019: $r=-.17$; 2013: $r=-.22$) and perceived importance of natural living attributes (2019: $r=-.20$; 2013: $r=-.16$). Lamb consumption positively correlated with attitudes towards eating meat (2019: $r=.27$; 2013: $r=.36$), beliefs about welfare standards in the Australian livestock industries (2019: $r=.25$; 2013: $r=.23$), trust in the people involved in the Australian livestock industries (2019: $r=.22$; 2013: $r=.28$), perceived welfare (2019: $r=.27$; 2013: $r=.32$), perceived negative impact of the Australian livestock industries on the environment (2019: $r=.27$; 2013: $r=.18$) and approval of livestock practices (2019: $r=.29$; 2013: $r=.31$). Perceived knowledge also positively correlated with lamb consumption (2019: $r=.24$; 2013: $r=.18$). these results were very similar to the 2013 results.

A pattern of similar relationships emerged for pork consumption. Attitudes towards livestock animal welfare was negatively correlated with pork consumption (2019: $r=-.20$; 2013: $r=-.20$) and perceived importance of natural living attributes (2019: $r=-.20$; 2013: $r=-.12$). Pork consumption positively correlated with attitudes towards eating meat (2019: $r=-.17$; 2013: $r=.29$), beliefs about welfare standards in the Australian livestock industries (2019: $r=.25$; 2013: $r=.23$, $p<01$), trust in the people involved in the Australian livestock industries (2019: $r=.25$; 2013: $r=.22$), perceived welfare ratings (2019: $r=.15$; 2013: $r=.26$), perceived negative impact of the Australian livestock industries on the environment (2019: $r=.16$; 2013: $r=.14$), approval of livestock practices (2019: $r=.17$; 2013: $r=.23$). Again, these results remained stable across the two surveys.

Egg consumption was generally uncorrelated with the attitudes assessed in these surveys. A minor exception was a weak correlation between egg consumption and attitude towards eating meat ($r=.09$, $p<.05$).

Only one small correlation was found between the frequency of seafood consumed in an average week and attitude, trust and knowledge variables. In the 2013 sample, but not in the 2019 sample, trust in sources of animal welfare information was positively but weakly correlated with seafood consumption ($r=.09$, $p<.05$). On the other hand, in the 2019 sample, but not in the 2013 sample, attitude towards eating meat was weakly correlated with seafood consumption ($r=.11$, $p<.05$).

Correlations for dairy product consumption are only available for the 2019 sample. Dairy consumption correlated negatively with Attitudes towards livestock animal welfare ($r=-.15$) and positively with attitude towards eating meat ($r=.16$) beliefs about welfare standards in the Australian livestock industries ($r=.16$), welfare ratings ($r=.14$) and approval of livestock practices ($r=.15$).

Table 17. Correlates of Community Behaviour and Reported Frequency of Meat Consumption. Shaded rows = 2013 sample, clear rows = 2019 sample.

	Comm. Beh.	Beef	Chicken	Lamb	Pork	Eggs	Seafood	Dairy
Gender (male=1, female=2)	.24**	-.16**	.01	-.07	-.18**	.04	.00	.05
Age	.19**	-.22**	-.05	-.13**	-.26**	-.07	.02	-.11*
Level of education	-.10*	-.08	-.12**	.01	-.04	.02	.23**	.08
Dog ownership (yes=1, no=0)	-.09*	-.13**	-.19**	.09	-.10*	.02	.27**	.14**
Cat ownership (yes=1, no=0)	.16**	-.02	-.01	-.02	-.03	.05	.08	.07
Attitudes towards livestock animal welfare	.08	.01	-.11*	-.02	-.02	.03	-.03	.08
Attitude towards eating meat	.08	.07	.10*	.06	.00	.07	-.05	.02
Beliefs about welfare standards in the Australian livestock industries	.12*	.10*	.01	.00	-.02	-.02	-.06	.06
Trust in the people involved in Australian livestock industries	.08	.02	.02	-.05	-.02	-.05	-.03	.12
Welfare ratings	.15**	.08	.06	.04	.05	-.06	-.09	.02
Perceived knowledge	.40**	-.25**	-.16**	-.22**	-.20**	-.14*	.00	.06
Knowledge of livestock practices	.45**	-.22**	-.03	-.17**	-.20**	-.04	.05	-.15**
Perceived negative impact of the Australian livestock industries on the environment	-.36**	.47**	.39**	.36**	.29**	.16*	.11*	.21**
	-.33**	.29**	.09	.27**	.17**	.09*	.00	.16**
	-.43**	.30**	.17**	.23**	.23**	.11*	-.01	.12*
	-.47**	.33**	.08	.25**	.25**	.07	.03	.16**
	-.37**	.31**	.21**	.28**	.22**	.10*	.00	.02
	-.44**	.30**	.07	.22**	.25**	.06	.03	.06
	-.36**	.29**	.26**	.32**	.26**	.13*	.06	.18*
	-.38**	.25**	.03	.27**	.15**	.02	.06	.14**
	.12**	.02	-.05	.18**	.08	-.01	.02	-.03
	.02	.10*	.06	.24**	.09	.03	.08	.06
	.00	.10*	-.01	.07	.11*	-.03	.01	.05
	-.07	-.02	-.01	.12*	-.04	.03	.00	.02
	-.36**	.29*	.19**	.18**	.14**	.06	-.02	.07

Table 17 cont. Correlates of Community Behaviour and Reported Frequency of Meat Consumption. Shaded rows = 2013 sample, clear rows = 2019 sample.

	Comm. Beh.	Beef	Chicken	Lamb	Pork	Eggs	Seafood	Dairy
	-.35**	.28**	.04	.27**	.16**	-.02	-.04	.05
Approval of livestock practices	-.38**	.36**	.16**	.31**	.23**	.14**	-.02	.11*
	-.42**	.21**	.05	.29**	.17**	-.01	.05	.15**
Husbandry attributes	.10*	.00	.02	.00	-.03		-.06	
	.13**	.06	.04	.02	-.05	-.08	-.02	.02
Natural living attributes	.28**	-.11*	-.04	-.16**	-.12**		.01	
	.31**	-.10*	.01	-.10*	-.20**	-.01	.01	-.15**
Animal welfare/rights group membership (yes=1, no=2)	-.36**	.12*	.10*	.06	.10*	-.07	.03	-.05
	-.43**	.14**	-.06	.07	.07	.01	-.04	.04
Trust in information	.32**	-.01	.01	-.02	-.03	.02	.09*	.02
	.20**	-.10*	.02	-.04	-.07	.00	.03	-.02
Donated money	.60**	-.05	-.03	-.09*	-.14**	-.04	.07	.02
	.66**	-.11	.05	-.08	-.06	.02	.10	-.05
Volunteered to animal welfare organisations	.51**	-.11*	-.03	-.12**	-.11*	-.08	.05	-.04
	.57**	.00	.09	.01	-.05	.04	.08	-.10

Note. *p<.05, **p<.01, two tailed. Shaded rows are 2013 data.

The correlations reported so far give an indication of the relationships between the variables surveyed and the outcome variables. However, in order to determine which combination of variables best predict community and consumer behaviours and the strength of this prediction, a series of stepwise multiple regressions were conducted with community behaviour and consumption of beef, chicken, lamb, pork, eggs, seafood and dairy as the dependent variables.

Detailed summaries of the regression models for the 2019 sample including beta and t values are provided in Appendix C.

Nine variables accounted for 62% of the variance in self-reported community behaviours ($F_{9,469} = 83.5, p<.001$). This is a marked increase over the 2013 results where 43% of the variance in community behaviours was predicted. Age ($\beta = -.15$), was a significant predictor of community behaviours indicating that the younger respondents were more likely to engage in community behaviours that displayed dissatisfaction with the way livestock animals are treated.

Several attitude variables also significantly predicted community behaviours. 'Trust in livestock industries' ($\beta=-.21$) was negatively associated with community behaviours that display dissatisfaction with the way livestock animals are treated while 'Livestock animal welfare attitude' ($\beta=.11$), 'Natural living attributes' ($\beta=.12$) and 'Approval of livestock practices' ($\beta=.12$) were positively associated with community behaviours. Trust in sources of livestock animal welfare information ($\beta=.09$) and frequency of accessing animal welfare information ($\beta=.32$) were also positively associated with community behaviours. Further to this, respondents who reported that they donated money to animal welfare organisations ($\beta=-.49$) were more likely to engage in community behaviours as were respondents who were a member of an animal welfare organisation ($\beta=-.16$). Perceived knowledge also predicted engagement in community behaviours ($\beta=-.16$).

Attitudes towards eating meat significantly predicted consumptions of beef, chicken and lamb. Although this attitude also correlated with pork consumption, other variables took precedence in the regression analysis. 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 D.

Six variables accounted 18% of the variance in self-reported frequency of beef consumption ($F_{6,422}=16.83$, $p<.001$). This was less than the 27% accounted for in the 2013 sample. Positive attitude towards eating meat ($\beta=.13$), attitudes towards Australian livestock industries and the environment ($\beta=.13$) and Positive attitude towards Australian livestock industries ($\beta=.14$) indicated that respondents with positive attitudes reported a higher frequency of consuming beef than those with less positive attitudes. Three demographic variables, age ($\beta=-.19$) gender ($\beta=-.16$) and level of education ($\beta=-.12$), were significantly associated with beef consumption. This indicates that older people, females and higher educated respondents reported the consumption of less beef compared to younger, less educated people and males.

Three variables accounted for 5% of the variance in the self-reported frequency of chicken consumption ($F_{3,425}=8.96$, $p<.001$) and this was substantially less than that found in the 2013 survey (17%). Positive attitudes towards eating meat were positively associated with chicken consumption ($\beta=.10$). Age was negatively associated with chicken consumption ($\beta=-.23$), indicating that younger people reported eating chicken more frequently than older people

and. Higher perceived knowledge was associated with higher chicken meat consumption ($\beta=.10$).

Four variables accounted for 12% of the variance in self-reported lamb consumption ($F_{3,425}=20.81$, $p<.001$) and this was lower than that found in the 2013 data (17%). Positive attitudes towards eating meat ($\beta=.18$), perceived knowledge ($\beta=.18$) and approval of livestock practices ($\beta=.13$) were positively associated with lamb consumption, suggesting that higher perceived knowledge and approval of livestock practices predicted higher self-reported lamb consumption.

Pork consumption was predicted by four variables ($F_{4,424}=16.62$, $p<.001$). Together they explained 13% of the variance in self-reported frequency of eating pork and this was a little higher than the 11% reported from the 2013 data. Trust in the livestock industries ($\beta=.19$) was positively related to pork consumption and natural living attributes ($\beta=-.12$) was negatively associated with pork consumption. Gender ($\beta=-.20$) and age ($\beta=-.12$) were the only demographic variables which predicted pork consumption, indicating that males reported, and younger people consumed pork more frequently during an average week compared to females and older people.

Only one variable predicted egg consumption and this was positive attitude towards eating meat ($\beta=.09$) and accounted for just 7% of the variance. There were no comparable results for 2013.

Seven percent of the variance in self-reported frequency of eating seafood (7% in 2013) could be explained by just one variable ($F_{1,427}=5.83$, $p<.001$). Only age ($\beta=.27$) was positively associated with seafood consumption.

Four variables predicted just 5% of the variance in dairy product consumption ($F_{4,456}=7.43$, $p<.001$). They were positive attitude towards Australian livestock industries ($\beta=.07$), natural living attributes ($\beta=-.18$), and husbandry attributes ($\beta=.11$). Age also predicted dairy consumption ($\beta=.14$), indicating that older people consumed more dairy products. No data were available from the 2013 survey.

Discussion

Demographic data indicate that the 2013 and the 2019 surveys are comparable in terms of sample composition. The age distributions were similar, gender split was close to 50:50 in

both samples, education distribution was similar and pet ownership was also analogous. Furthermore, the demographic data was similar to census data for both NSW and Victoria.

The results from the present survey provided data relevant to two key aspects of trends in public attitudes and behaviour. The first was the stability of the various measures of attitude, knowledge and behaviour over time and the second was changes in attitudes and behaviour over time. Stability of the measures of attitude, knowledge and behaviour are important indicators of their reliability over time. Demonstrating such stability allows comparisons of “like with like” across the two samples and, more generally, validates the questionnaire as a survey tool that can be used to monitor trends in attitudes, knowledge and behaviour. Respondents’ understanding of what animal welfare entails remained quite stable over time. In addition, PCA analysis revealed that the measures of attitudes (attitude scales) remained stable across the two survey samples. These results lend confidence to the continued use of these measures for monitoring trends in public attitudes.

In general, trends showed that public engagement has increased over time. Opinion leaders’ communication activities increased (Table 14) and the distribution of the opinion leadership scale showed a trend for more people to be more engaged over time (Figure 10). Respondents’ generally reported more community behaviours; in particular, talking to friends and family, signing petitions and donating to welfare organisations increased (Table 13). This suggests a greater awareness of animal welfare issues in the general population. The survey does not provide data on why this might have occurred, but there has been an increase in publicity relating to animal welfare issues recently with the vegan protests (for example, the Dominion protests held in several locations in Victoria on 8th of April 2019) and the live sheep export issues (for example, a 60-minutes report aired on 8th of April 2018) being two recent examples. Given that publicity is generally negative and the fact that public attitudes have tended to become more negative, increased engagement by the public represents a threat to licence to farm.

There appears to be a decrease in consumption in animal products, however this decrease is not pronounced and depends on the product. Beef intake has reduced in frequency while the other animal products have remained steady. Of course, this reflects frequency of consumption rather than the amount consumed. Nevertheless, other data show that lamb and beef consumption per capita is steadily declining (Ratnasiri and Bandara 2017) while other products, most notably chicken meat, is increasing. While the prevalence of vegetarianism appears comparable, the present survey reported an increase in veganism from 0.6% to 1.2%, although these percentages are very small and as such may not be reliable. Overall, the picture is fairly complex in regard to consumption trends.

There has been a trend for some public attitudes to livestock animal welfare to become more negative, while others have shown little change. Most categories of acceptability of animal use showed a small decrease over time (Table 5). On the other hand, public perceptions of the welfare of livestock animals showed no change (Table 6), as did attitudes towards livestock animal welfare, attitudes towards eating meat, beliefs about welfare standards and perceived negative impact of the Australian livestock industries on the environment. Also notable was the fact that the rated importance of housing and husbandry attributes of farm animals did not change across the two samples. Thus, the way in which people viewed management of animals, and, therefore the criteria that were used to assess welfare, remained largely the same over time.

However, trust in the Australian livestock industries decreased as did both trust and approval ratings of people working in abattoirs and those responsible for transporting livestock by land and, in particular, sea. Given that trust correlated significantly with both consumption of most animal products as well as community behaviours in opposition to the livestock industries, this decrease in trust represents a threat both to the sale of animal products and licence to farm. People have remained most trusting of information obtained from product labels, television, print media or from conversations with friends, relatives or colleagues. Trust in social media and animal welfare websites has declined. Supermarkets already seek niche markets that focus on animal welfare and the environment and use product labels to promote this. There is currently no coordinated attempt by the livestock industries to do this.

Both actual knowledge and perceived knowledge of livestock husbandry practices remained low in both the 2013 and 2019 samples and were not correlated with each other. There was a tendency for actual knowledge to have decreased across the two samples. However, actual knowledge is uncorrelated with animal product consumption and community behaviour. The argument that lack of knowledge by the public causes their attitudes to animal welfare is not based on any data. It may be that a better knowledge of farming practices would serve to “inoculate” people against persuasive arguments that livestock animal welfare is unacceptably poor. However, this needs to be substantiated empirically.

As was the case for the 2013 sample, a subset of the 2019 sample were identified as opinion leaders on the basis that they reported being used as sources of information about farm animal welfare and provided such information to the people that they came in contact with. The proportion of opinion leaders identified in the 2019 sample was smaller than in the 2013 sample, but their characteristics were similar in that they tended to be more negative about

farm animal welfare, had higher perceived knowledge but no better actual knowledge than the remainder of the sample (non-opinion leaders). The fact that this result is consistent across the samples indicates that the importance of these people in influencing community attitudes needs to be investigated. In particular, given their low level of knowledge but high level of perceived knowledge, do they promulgate misinformation about farm animal welfare? If so, is this intentional or is it a genuine misunderstanding that, if changed, would lead to a different view of the livestock industries?

The relationships between attitudes and demographic variables on the one hand and community and consumption variables on the other were reasonably consistent across the two samples. This indicates that these variables, which were reported earlier to be stable over time, remain important predictors of behaviour and, to a lesser extent, consumption. Particularly notable was that these variables were even stronger predictors of community behaviours in the 2019 sample than had been the case in the 2013 sample (62% vs 43% of the variance in behaviour accounted for). This lends support to the proposition that attempting to deal with these attitudes may be a key way of mitigating the threats that community behaviours pose for licence to farm. What needs further investigation is why people hold the attitudes that they do and, therefore, what can be done to address these attitudes. It is important to recognise that addressing these attitudes may require a social change approach or changes to livestock industry practices or both.

In addition, the database, consisting of data from both the 2013 and the 2019 surveys, provides a resource which will allow more specific analysis. The data set comprising responses to the two questionnaires provides a data base that can be mined to answer other questions. It is recommended that stakeholders consider what further questions might be answered using these data.

In summary, data from this 2019 survey indicate several things:

1. The measures used are reliable over time
2. People's engagement in animal welfare issues is increasing
3. People's attitudes are tending to become more negative
4. People's trust in those working in abattoirs and sea transport is declining
5. There is an increased use of and trust in personal information sources of animal welfare information rather than institutionalised sources
6. There is an increasing risk to licence to farm

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Appendices

Appendix A: 2013 Survey

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?

1. Male
2. Female

A2. What is your year of birth? _____ YYYY

A3. What is your highest level of education?

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? _____

A5. Who do you normally live with? (select all that apply)

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?

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

A7. What is your religious affiliation? (*Unprompted*)

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. 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)	_____

A9. Have you lived, or do you now live on a farm with animals? (If yes, select all that apply)

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

This next section contains questions about your purchase of and consumption of meat and meat 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...?

- 1. Meat and vegetable eater (A person who eats a variety of foods including red & white meat)
- 2. Vegetarian (A vegetarian is a person who does not eat red or white meat, including fish, but eats eggs and dairy products)
- 3. Vegan (A vegan is 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	
1. Promoting good food quality	1	2	3	4	5
2. Humane treatment of animals	1	2	3	4	5
3. Caring for our pets	1	2	3	4	5
4. Livestock farmers and handlers using best practice	1	2	3	4	5
5. Preventing animal cruelty	1	2	3	4	5
6. Conserving native species	1	2	3	4	5
7. Protecting the rights of animals	1	2	3	4	5
8. Livestock farmers and handlers caring for their animals	1	2	3	4	5
9. Balancing the needs of animals and people	1	2	3	4	5

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

	Extremely unacceptable			Extremely acceptable	
1. Using animals for the production of food	1	2	3	4	5
2. Using animals for the production of clothing	1	2	3	4	5
3. Using animals as companions (pets)	1	2	3	4	5
4. Using animals for research	1	2	3	4	5
5. Using animals for sport and entertainment	1	2	3	4	5

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	
1. Livestock animals have the same right to life as humans	1	2	3	4	5
2. Humans are more important than livestock animals.	1	2	3	4	5
3. Livestock animals have the same rights as domestic pets					
4. Too much fuss is made over livestock animal welfare	1	2	3	4	5
5. The welfare of livestock animals is an important consideration for me	1	2	3	4	5
6. People should do whatever is necessary (legal or illegal) to stop animals being used in livestock production systems	1	2	3	4	5

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	
1. Free range foods taste better than intensively farmed foods	1	2	3	4	5
2. People have a right to eat meat	1	2	3	4	5
3. Meat is part of a balanced diet	1	2	3	4	5
4. Meat is a healthy food	1	2	3	4	5
5. Australian livestock farmers deserve better prices and purchase conditions from supermarkets	1	2	3	4	5

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	
1. The standards of livestock animal welfare on Australian farms need to be improved	1	2	3	4	5
2. Livestock animal welfare standards in Australian abattoirs are very high.	1	2	3	4	5
3. Live animal exports from Australia should continue	1	2	3	4	5
4. Increased regulation of the treatment of livestock animals is needed	1	2	3	4	5
5. Australian abattoirs are dedicated to maintaining the welfare of livestock animals prior to slaughter.	1	2	3	4	5
6. Compared to overseas, Australian abattoirs operate to good livestock animal welfare standards.	1	2	3	4	5

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	
1. I trust farmers to properly care for their animals	1	2	3	4	5
2. I trust abattoir workers to properly care for their animals	1	2	3	4	5
3. I trust livestock animal handlers to properly care for their animals	1	2	3	4	5
4. I trust those responsible for transporting livestock animals by <u>sea</u> to properly care for their animals	1	2	3	4	5
5. I trust those responsible for transporting livestock animals by <u>land</u> to properly care for their animals	1	2	3	4	5

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
1. Laying hens (producing eggs)	1	2	3	4	5	
2. Dairy cows (producing milk)	1	2	3	4	5	
3. Pigs (meat)	1	2	3	4	5	
4. Beef (meat)	1	2	3	4	5	
5. Sheep (meat)	1	2	3	4	5	
6. Sheep (wool)	1	2	3	4	5	
7. Goats (meat)	1	2	3	4	5	

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 you know a lot to 5=you feel you know nothing at all.

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

	A lot	A moderate amount	A little bit	Very little	Nothing at all
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)

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
- c) clips applied to the rear end of the sheep
- d) a topical agent applied to the rear end of the sheep

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
- c) In Australia, production of Kosher approved meat is not governed by any welfare standards or regulations
- d) In Australia, all Kosher approved meat comes from overseas

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
- c) moving sheep from one pen to another
- d) tagging sheep that are ready for shearing

C5. Dehorning.....

- a) a means of identification in cattle
- b) removal of the horns to prevent injury
- c) filing down hooves
- d) filing down the horns

C6. Pre-slaughter stunning.....

- a) paralyses an animal immediately prior to slaughter
- b) renders an animal unconscious immediately prior to slaughter
- c) paralyses an animal immediately prior to euthanasia of sick or injured animals
- d) renders an animal unconscious immediately prior to euthanasia of sick or injured animals

C7. Tail docking.....

- a) cutting and removal of skin around the rear end of an animal
- b) removal of a tail
- c) removing the hair from a tail
- d) clipping the tail back with a peg

C8. Feedlotting animals.....

- a) fattening animals in a relatively small enclosure
- b) grazing animals on pasture
- c) hand feeding animals on pasture
- d) hand feeding sick animals in a relatively small enclosure

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
- c) clips placed over the teeth of intensively farmed pigs to prevent injury
- d) clips placed over the teeth of pigs to prevent the formation of cavities

C10. Hot iron branding.....

- a) use of a hot iron brand when training livestock
- b) use of a hot iron to brand livestock for identification purposes
- c) branding meat with a hot iron for identification purposes
- d) branding meat with a hot iron to improve meat quality

C11. Free-range chickens.....

- a) Chickens that are free to roam around in a large shed
- b) Chickens that are given access to dust baths and nesting material
- c) Chickens that have access to an outdoor area as they please
- d) Chickens that are bred and reared without the use of chemicals or hormones

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
- c) In Australia, production of Halal approved meat is not governed by any welfare standards or regulations

d) In Australia, all Halal approved meat comes from overseas

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

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
1. Mulesing	1	2	3	4	5
2. Kosher meat	1	2	3	4	5
2. Halal meat	1	2	3	4	5
3. Crutching	1	2	3	4	5
4. Castration	1	2	3	4	5
5. De-horning	1	2	3	4	5
6. Pre-slaughter stunning	1	2	3	4	5
7. Curfew	1	2	3	4	5
8. Confinement	1	2	3	4	5
9. Tail docking	1	2	3	4	5
10. Feed-lotting animals	1	2	3	4	5
11. Euthanasia of sick/dying/injured animals	1	2	3	4	5
12. Clipping teeth	1	2	3	4	5
13. Hot iron branding	1	2	3	4	5

14. Live sheep and cattle sea transport	1	2	3	4	5
15. Live sheep and cattle ground transport	1	2	3	4	5
16. Free-range	1	2	3	4	5
17. Halal meat	1	2	3	4	5

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
1. social contact with same species	1	2	3	4	5
2. contact with offspring	1	2	3	4	5
3. individual housing	1	2	3	4	5
4. freedom to roam outdoors	1	2	3	4	5
5. social contact with different species	1	2	3	4	5
6. good nutrition	1	2	3	4	5
7. regular exercise	1	2	3	4	5
8. good ventilation	1	2	3	4	5
9. medications	1	2	3	4	5
10. good waste disposal	1	2	3	4	5
11. vaccinations	1	2	3	4	5
12. protection from predators	1	2	3	4	5
13. outdoor housing	1	2	3	4	5

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 or the number 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

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

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?

- 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 _____
- volunteered your services to animal welfare organisations
 - If yes, please tell me which group or groups you have volunteered your services to _____
- 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)

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.

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
1. Television (e.g., TV news, documentaries)	1	2	3	4	5
2. Print media (e.g., magazines, newspapers, journal articles)	1	2	3	4	5
3. Social network sites, related social media (e.g., Facebook, YouTube, Twitter)	1	2	3	4	5
4. Animal welfare related websites	1	2	3	4	5
5. Radio	1	2	3	4	5
6. Friends, relatives or colleagues	1	2	3	4	5
7. Labels (Product label)	1	2	3	4	5

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

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 _____

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	2	3	4	5
Told no one				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 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

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

Appendix B: 2019 survey

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?

1. Male
2. Female
3. Other

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

A3. What is your highest level of education?

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? _____

A5a. Do you currently own a dog(s):

1. Yes
2. No

A5b. Do you currently own a cat(s):

1. Yes
2. No

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

A6. Would you describe yourself primarily as a...?

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

A7. 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
8. Kangaroo.....	1	2	3	4	5
9. Goat.....	1	2	3	4	5

A8. Do you ever purchase food products primarily because they are animal welfare friendly?

1. Yes
2. No

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	
1. Humane treatment of animals	1	2	3	4	5	
2. Caring for our pets	1	2	3	4	5	
3. Livestock farmers and handlers using best practice	1	2	3	4	5	
4. Preventing animal cruelty	1	2	3	4	5	
5. Protecting the rights of animals	1	2	3	4	5	
6. Livestock farmers and handlers caring for their animals	1	2	3	4	5	
7. Balancing the needs of animals and people	1	2	3	4	5	

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

	Extremely unacceptable				Extremely acceptable	
1. Using animals for the production of food	1	2	3	4	5	
2. Using animals for the production of clothing	1	2	3	4	5	
3. Using animals as companions (pets)	1	2	3	4	5	
4. Using animals for research	1	2	3	4	5	
5. Using animals for sport and entertainment	1	2	3	4	5	

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. These next set of statements are focused on understanding your attitudes towards livestock animals. On a scale from 1 to 5 where 1= strongly disagree and 5 = strongly agree, to what extent do you agree or disagree with the following statements

	Strongly disagree				Strongly agree	
1. Livestock animals have the same right to life as humans	1	2	3	4	5	
2. Humans are more important than livestock animals.	1	2	3	4	5	
3. Livestock animals have the same rights as domestic pets	1	2	3	4	5	
4. Too much fuss is made over livestock animal welfare	1	2	3	4	5	
5. The welfare of livestock animals is an important consideration for me	1	2	3	4	5	

6. People should do whatever is necessary (legal or illegal) to stop animals being used in livestock production systems	1	2	3	4	5
---	---	---	---	---	---

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

	Strongly disagree			Strongly agree	
1. Free range foods taste better than intensively farmed foods	1	2	3	4	5
2. People have a right to eat meat	1	2	3	4	5
3. Meat is part of a balanced diet	1	2	3	4	5
4. Meat is a healthy food	1	2	3	4	5
5. Australian livestock farmers deserve better prices and purchase conditions from supermarkets	1	2	3	4	5

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	
1. The standards of livestock animal welfare on Australian farms need to be improved	1	2	3	4	5
2. Livestock animal welfare standards in Australian abattoirs are very high.	1	2	3	4	5
3. Live animal exports from Australia should continue	1	2	3	4	5
4. Increased regulation of the treatment of livestock animals is needed	1	2	3	4	5
5. Australian abattoirs are dedicated to maintaining the welfare of livestock animals prior to slaughter.	1	2	3	4	5
6. Compared to overseas, Australian abattoirs operate to good livestock animal welfare standards.	1	2	3	4	5
7. Using wild animals, for example kangaroos and goats, for meat is acceptable.	1	2	3	4	5

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	
1. I trust farmers to properly care for their animals	1	2	3	4	5
2. I trust abattoir workers to properly care for their animals	1	2	3	4	5
3. I trust livestock animal handlers to properly care for their animals	1	2	3	4	5
4. I trust those responsible for transporting livestock animals by <u>sea</u> to properly care for their animals	1	2	3	4	5

5. I trust those responsible for transporting livestock animals by land to properly care for their animals	1	2	3	4	5
6. I trust those responsible for taking animals from the wild for human consumption.	1	2	3	4	5

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
1. Laying hens (producing eggs)	1	2	3	4	5
2. Broiler chickens (meat)	1	2	3	4	5
3. Dairy cows (producing milk)	1	2	3	4	5
4. Pigs (meat)	1	2	3	4	5
5. Beef cattle (meat)	1	2	3	4	5
6. Sheep (meat)	1	2	3	4	5
7. Sheep (wool)	1	2	3	4	5
8. Seafood	1	2	3	4	5
9. Goats (meat)	1	2	3	4	5
10. Kangaroo (meat)	1	2	3	4	5

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 you 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. The beef industry	1	2	3	4	5
2. The dairy industry	1	2	3	4	5
3. The sheep (meat) industry	1	2	3	4	5
4. The sheep (wool) industry	1	2	3	4	5
5. The pork industry	1	2	3	4	5
6. The egg industry	1	2	3	4	5
7. Seafood industry	1	2	3	4	5
8. Kangaroo (meat) industry	1	2	3	4	5
9. Goat (meat) 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-C19

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
- c) a topical agent applied to the rear end of the sheep

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
- c) In Australia, production of Kosher approved meat is not governed by any welfare standards or regulation

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
- c) tagging sheep that are ready for shearing

C5. Pre-slaughter stunning.....

- a) paralyses an animal immediately prior to slaughter
- b) renders an animal unconscious immediately prior to slaughter
- c) shocks an animal prior to slaughter to improve meat quality

C6. Tail docking.....

- a) removal of a tail
- b) removing the hair from a tail
- c) clipping the tail back with a peg

C7. Feedlotting animals.....

- a) fattening animals in a relatively small enclosure
- b) grazing animals on pasture
- c) hand feeding animals on pasture

C8. 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
- c) Chickens that have access to an outdoor area for only part of the day

C9. 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
- c) In Australia, production of Halal approved meat is not governed by any welfare standards or regulations

C10. Castration.....

- a) treatment with hormones to promote growth
- b) surgical removal of testicles
- c) vaccination to prevent disease

C11. Environmental enrichment.....

- a) allowing livestock to roam freely
- b) placing novel objects in housing enclosures
- c) providing a variety of different foods

C12. In Australia, goat meat is predominantly.....

- a) obtained from feral goats (shot).
- b) obtained from small goat farms
- c) imported from overseas

C20. In Australia, kangaroo meat is predominantly.....

- a) obtained from wild kangaroos
- b) obtained from farmed kangaroos
- c) obtained from surplus kangaroos in zoos

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
1. Present livestock farming methods are polluting our water supplies	1	2	3	4	5	
2. I trust farmers in the livestock industry to protect the environment.	1	2	3	4	5	
3. Current meat processing methods are polluting our environment	1	2	3	4	5	
4. Fertilisers, pesticides and other farm chemicals are not a threat to the environment if used as directed.	1	2	3	4	5	
5. Left to themselves, most livestock farmers would protect the environment	1	2	3	4	5	
6. Present livestock farming methods leads to substantial loss of vegetation	1	2	3	4	5	

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
1. Mulesing	1	2	3	4	5	
2. Kosher meat	1	2	3	4	5	
3. Crutching	1	2	3	4	5	
4. Castration	1	2	3	4	5	
5. Pre-slaughter stunning	1	2	3	4	5	

6. Confinement	1	2	3	4	5
7. Tail docking	1	2	3	4	5
8. Feed-lotting animals	1	2	3	4	5
9. Euthanasia of sick/dying/injured animals	1	2	3	4	5
10. Live sheep and cattle sea transport	1	2	3	4	5
11. Live sheep and cattle ground transport	1	2	3	4	5
12. Free-range	1	2	3	4	5
13. Halal meat	1	2	3	4	5
14. Environmental enrichment	1	2	3	4	5
15. Humane slaughter	1	2	3	4	5
16. Using kangaroos for meat	1	2	3	4	5
17. Using feral goats for meat	1	2	3	4	5
18. Pain-relief for painful husbandry procedures	1	2	3	4	5

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
1. Social contact with same species	1	2	3	4	5
2. Contact with offspring	1	2	3	4	5
3. Freedom to roam outdoors	1	2	3	4	5
4. Good nutrition	1	2	3	4	5
5. Regular exercise	1	2	3	4	5
6. Good ventilation	1	2	3	4	5
7. Medications (i.e. antibiotics) for health	1	2	3	4	5
8. Good waste disposal	1	2	3	4	5
9. Vaccinations	1	2	3	4	5
10. Environmental enrichment	1	2	3	4	5
11. Natural lighting	1	2	3	4	5
12. Sufficient space (per animal)	1	2	3	4	5
13. Stockperson (handling) skill	1	2	3	4	5
14. Processor (abattoir & wild harvest) skill	1	2	3	4	5

15. Opportunities to perform highly motivated behaviours	1	2	3	4	5
16. Pain relief for painful husbandry procedures	1	2	3	4	5

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 or the number 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) _____

E2. Have you done any of the following activities to express your dissatisfaction with any aspect of livestock farming?

	Never?	In the last year?	Ever?
1. Written a letter to a politician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Posted/shared information about an issue on social media (such as Facebook, Twitter, Instagram, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Called a radio talk back segment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Attended a public rally or demonstration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Signed a petition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Donated money to animal welfare organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Donated goods other than money to animal welfare organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Volunteered your services to animal welfare organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Spoken to colleagues, family members, or friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Written a letter to a newspaper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Other (write) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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.

E4. How regularly have you heard about or obtained information regarding farm animal welfare issues 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. Television (e.g., TV news, documentaries)	1	2	3	4	5
2. Radio	1	2	3	4	5
3. Internet	1	2	3	4	5
4. Print media (e.g., magazines, newspapers, scientific papers)	1	2	3	4	5
5. Friends, relatives or colleagues	1	2	3	4	5
6. Animal welfare organizations e.g. RSPCA	1	2	3	4	5
7. Government advertisements/promotions	1	2	3	4	5
8. Celebrity chef/cook	1	2	3	4	5
9. Industry bodies	1	2	3	4	5
10. Supermarkets (e.g. Coles, Woolworths, IGA)	1	2	3	4	5
11. Labels (product labels)	1	2	3	4	5
12. Social network sites, related social media (e.g., Facebook, YouTube, Twitter, blogs)	1	2	3	4	5

E5. If you do visit livestock animal welfare related websites can you please name up to three websites in order of frequency.

E6. Suppose that each of the following has provided information about farm animal welfare in Australia. Please indicate to the extent you would trust that information where 1=no trust and 5=complete trust

	No trust		Neither trust nor distrust		Complete trust
1. Television (e.g., TV news, documentaries)	1	2	3	4	5
2. Radio	1	2	3	4	5
3. Internet	1	2	3	4	5
4. Print media (e.g., magazines, newspapers, scientific papers)	1	2	3	4	5
5. Friends, relatives or colleagues	1	2	3	4	5
6. Animal welfare organizations e.g. RSPCA	1	2	3	4	5
7. Government advertisements/promotions	1	2	3	4	5
8. Celebrity chef/cook	1	2	3	4	5
9. Industry bodies	1	2	3	4	5
10. Supermarkets (e.g. Coles, Woolworths, IGA)	1	2	3	4	5
11. Labels (product labels)	1	2	3	4	5
12. Social network sites, related social media (e.g., Facebook, YouTube, Twitter, blogs)	1	2	3	4	5

E7. In rank order can you please name the top three sources you would most trust for information about livestock animal welfare information? (*Unprompted*)

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/Research 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 family, friends and neighbours regarding livestock animal welfare.

E8. During the past six months, how many people have you told about Australian livestock animal welfare?

1	2	3	4	5
Told no one				Told a number of people

E8. Compared with your family and/or 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

E10. Overall, in all of your discussions with family and friends 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

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

Appendix C. Regression results of community behaviour and animal product consumption

Community behaviour R²=.62

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.025	.830		2.441	.015		
Donated money to animal welfare organisations	1.950	.124	.494	15.744	.000	.831	1.203
Trust_In_livestock_industries	-.410	.073	-.208	-5.612	.000	.598	1.673
Currently a member of an animal welfare or animal rights group or organisation	-.939	.180	-.163	5.230	.000	.846	1.182
Livestock animal welfare attitude	.185	.091	.077	2.026	.043	.563	1.777
Perceived knowledge	.317	.062	.161	5.104	.000	.826	1.211
Age Groups	-.149	.036	-.124	-4.156	.000	.925	1.081
Natural living attributes	.365	.124	.095	2.952	.003	.785	1.274
Trust in information	.209	.087	.071	2.411	.016	.957	1.045
Approval of livestock practices	-.252	.119	-.088	-2.120	.035	.477	2.097

Beef R²=.18

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.313	.388		8.538	.000		
Positive attitude towards Aus livestock industries	.168	.074	.141	2.264	.024	.495	2.021
Age Groups	-.118	.028	-.187	-4.206	.000	.972	1.029
Positive attitude towards eating meat	.146	.059	.134	2.472	.014	.652	1.533
Gender	-.338	.096	-.163	-3.531	.000	.899	1.113
Level of education	-.116	.051	-.102	-2.274	.023	.953	1.050
Attitudes towards Australian livestock industries and the environment	.151	.067	.130	2.250	.025	.570	1.753

Chicken R²=.05

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.473	.230		15.091	.000		
Age Groups	-.128	.027	-.226	-4.664	.000	.939	1.065
Perceived knowledge	.100	.045	.108	2.214	.027	.938	1.066
Positive attitude towards eating meat	.099	.046	.102	2.155	.032	.985	1.016

Lamb $R^2=.12$

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.715	.236		3.032	.003		
Approval of livestock practices	.179	.080	.129	2.231	.026	.610	1.639
Perceived knowledge	.167	.046	.176	3.629	.000	.875	1.143
Positive attitude towards eating meat	.181	.055	.181	3.300	.001	.682	1.467

Pork $R^2=.13$

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.982	.503		7.917	.000		
Gender	-.415	.098	-.199	4.244	.000	.928	1.078
Trust_In_livestock_industries	.200	.049	.192	4.075	.000	.922	1.085
Age Groups	-.074	.029	-.117	-2.572	.010	.987	1.013
Natural living attributes	-.242	.095	-.119	-2.546	.011	.927	1.079

Eggs $R^2=.07$

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.282	.227		14.455	.000		
Positive attitude towards eating meat	.107	.053	.093	2.008	.045	1.000	1.000

Seafood $R^2=.07$

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	2.212	.119		8.512	.000		
Age Groups	.173	.030	.271	5.828	.000	1.000	1.000

Dairy $R^2=.05$

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	4.574	.517		8.854	.000		
Positive attitude towards Aus livestock industries	.078	.055	.074	1.439	.151	.788	1.269
Age Groups	.080	.026	.141	3.075	.002	.979	1.021
Natural living attributes	-.330	.107	-.183	-3.099	.002	.587	1.704
Husbandry_attributes	.215	.103	.114	2.092	.037	.692	1.446

Appendix D: Correlations amongst attitude variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Livestock animal welfare attitude	.00	.43**	.61**	.44**	.45**	.16**	.09	.37**	.57**	.12**	.43**	.11*	.29**	.30**	.26**
2. Positive attitude toward eating meat	.43**	.00	.56**	.59**	.58**	.10*	.06	.48**	.56**	.10*	.15**	.05	.19**	.12**	.17**
3. Positive attitude towards Aus livestock industries	.61**	.56**	.00	.75**	.66**	.32**	.18**	.61**	.71**	.01	.38**	.06	.27**	.30**	.20**
4. Trust in livestock industries	.44**	.59**	.75**	.00	.71**	.26**	.12**	.66**	.61**	.07	.20**	.03	.24**	.24**	.19**
5. Welfare ratings	.45**	.58**	.66**	.71**	.00	.18**	.12**	.58**	.61**	.05	.23**	.01	.24**	.17**	.17**
6. Perceived knowledge	.16**	.10*	.32**	.26**	.18**	.00	.28**	.25**	.34**	.02	.11*	.02	.02	.03	.07
7. Knowledge of livestock practices	.09	.06	.18**	.12**	.12**	.28**	.00	.13**	.23**	.01	.04	.05	.05	.03	.06
8. Attitude towards Australian livestock industries and the environment	.37**	.48**	.61**	.66**	.58**	.25**	.13**	.00	.51**	.13**	.17**	.01	.13**	.19**	.12**
9. Approval of livestock practices	.57**	.56**	.71**	.61**	.61**	.34**	.23**	.51**	.00	.00	.29**	.07	.25**	.25**	.17**
10. Husbandry attributes	.12**	.10*	.01	.07	.05	.02	.01	.13**	.00	.00	.51**	.07	.08	.12**	.10*
11. Natural living attributes	.43**	.15**	.38**	.20**	.23**	.11*	.04	.17**	.29**	.51**	.00	.15**	.14**	.22**	.16**
12. Trust in information	.11*	.05	.06	.03	.01	.02	.05	.01	.07	.07	.15**	.00	.09*	.16**	.05
13. Currently a member of an animal welfare or animal rights group or organisation	.29**	.19**	.27**	.24**	.24**	.02	.05	.13**	.25**	.08	.14**	.09*	.00	.29**	.34**
14. Donated money to animal welfare organisations	.30**	.12**	.30**	.24**	.17**	.03	.03	.19**	.25**	.12**	.22**	.16**	.29**	.00	.30**
15. Volunteered your services to animal welfare organisations	.26**	.17**	.20**	.19**	.17**	.07	.06	.12**	.17**	.10*	.16**	.05	.34**	.30**	.00