



## A Different Cut? Comparing Attitudes toward Animals and Propensity for Aggression within Two Primary Industry Cohorts—Farmers and Meatworkers

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### Abstract

Previous research has examined a range of demographic variables that have been shown to influence an individual's attitude toward, and in turn their treatment of, animals. Little is known, however, about the effect of certain occupations upon these attitudes. The current study examines attitudes toward animals and the propensity for aggression within a sample of farmers and meatworkers in Queensland, Australia. Recent findings and publicity around the effects of employment (and cases of deliberate animal cruelty) within these industries indicates that this is an area in need of investigation from both human and animal welfare perspectives. The implications of the current findings for the meat-working industry and for the field of human-animal studies are discussed.

### Keywords

attitudes to animals, AAS, meatworks, primary industry, propensity for aggression

Previous research has examined a range of demographic variables that have been shown to influence an individual's attitude toward, and in turn his or her treatment of, animals. Such variables have included: sex (Herzog, 2007; Driscoll, 1995), gender role orientation (Herzog, Betchart, & Pittman, 1991), age, geographic location, income level, race, educational level (Kellert, 1980), companion animal guardianship both as a child and in the present (Daly & Morton, 2009; Paul, 2000), religious affiliation (Bowd & Bowd, 1989), marital status (Kafer, Lago, Wambolt, & Harrington, 1992), ethical ideology (Galvin & Herzog, 1992), philosophical stance (Signal & Taylor, 2006b), and occupation (Signal & Taylor, 2006a; Kellert, 1980).

Although there is ongoing debate regarding the exact nature of the interaction between some of these demographic variables and associated attitudes

toward, and treatment of, animals, one of the more consistent findings within the animal studies (AS) literature is the apparent interaction of occupation with attitudes (e.g., Signal & Taylor, 2006a, 2007; Kellert, 1980). However, this interaction remains underresearched. In one of the few studies to examine the interaction between occupation (among other demographic variables) and attitudes toward animals, Kellert (1980) surveyed over 3,000 members of the American public using a scale that measured attitudes toward animals based on ten basic domains (i.e., naturalistic, ecologicistic, humanistic, moralistic, scientific, aesthetic, utilitarian, dominionistic, negativistic, neutralistic). Differences in attitudes toward animals were observed across many of the variables, including among participants with differing income levels and occupations. When Signal and Taylor (2006a) explored the influence of a range of demographic variables, they reported that only income and occupation were found to have a statistical impact on community members' ( $n = 600$ ) attitudes toward animals. In particular, both Kellert's (1980) and Signal and Taylor's (2006a) studies indicate that individuals engaged in occupational categories considered "primary" (defined as industries involved in the direct extraction or collection of natural resources including metal/lumber and farming/fishing) reported having significantly less positive attitudes toward animals than those in any other occupation.

Given the limited extant research, it is not possible to ascertain whether such findings indicate that those employed within the primary industry sector have poorer attitudes toward animals *per se*, since some research suggests that this may instead be an indication that individuals engaged in this occupational field have a more utilitarian view toward animals, rather than a negative view toward animals in general (e.g., Taylor & Signal, 2009; Porcher, Cousson-Gelie, & Dantzer, 2004). It may be that for many within the primary industry sector, stock are commodities. They are bred, raised, bought, sold, and slaughtered for monetary gain, and to develop an emotional connection to these animals (as many do with their companion animals) may not be possible. For example, Porcher (2006) suggests that the intensification of modern farming practices has led to an "instituted distance between livestock and farmers" (p. 64). Porcher goes on to suggest that this emotional distancing, or what she terms "repression of affect" (p. 65), results from a range of factors but is predominantly caused by the greater number of animals per farmer associated with intensive farming methods and the related increases in animal turnover and reduced time/opportunity for positive human-animal interactions. Purcell (2011) similarly identifies decreasing "intimacy" between farmers and individual animals and increasing impersonalization of meat-production systems. One effect of this distancing, which both Porcher (2006) and Purcell

(2011) suggest is endemic to the animal production industry, appears to be an increase in propensity for violence directed at animals. For example, when discussing the “collection” of poultry prior to transport, Porcher states that “this type of work, which has to be done as quickly as possible, gives rise to violent behaviour towards animals that seems to function, as respondents themselves admitted, as a kind of catharsis” (p. 64). Clearly, given the negative consequences of such emotional distancing for both animals and humans, further investigation into the effect of occupation—and particularly, employment within the primary industry sector of animal/meat processing and production—upon attitudes toward animals is warranted.

However, a serious methodological issue limits the utility of occupation-based findings to date in that a very broad definition of “primary industry” has been applied in most, if not all, the existing attitudinal research in this area. For example, Signal and Taylor’s (2006a) study defined “primary industry” in accordance with a popular online job search engine ([www.seek.com.au](http://www.seek.com.au)), which meant that their “primary industry” cohort included primary producers (i.e., livestock and crop farmers), meatworkers, those involved in the transportation of livestock and anyone in a “primary” resource industry such as mining. Obviously, not all these professions involve working closely with animals. It may therefore be the case that the classification “primary industry” needs to be examined in more detail, with the different occupations treated as distinct and discrete subsets of those occupations classed as “primary industry.” Two occupations within this overall “industry” that are of special interest are those of “farmer” (particularly livestock) and “meatworker” (i.e., someone employed in a meat-processing plant or slaughterhouse) because both occupations require a high level of contact with animals but involve potentially very different interactions.

There is a small body of existing work that addresses livestock farmers’ attitudes toward animals. In particular, it tends to focus upon how attitudes toward animals relate to various personality factors, support for animal welfare initiatives, and on-farm practices (see Austin, Deary, Edwards-Jones, & Arey [2005] for a brief review). Initial research in this area suggests that individuals in this group may have lower attitudes toward animals (i.e., score lower on measures of attitude toward animals such as the Animal Attitude Scale [AAS]; Herzog et al., 1991), view animals differently, and behave differently toward animals because of the nature of their work (Signal & Taylor, 2006a; Austin et al., 2005; Wilkie, 2005; Porcher et al., 2004; Kellert, 1980). Despite this initial work with farmers, however, there remains limited research comparing the attitudes of livestock farmers and those engaged in the meat-processing industry (i.e., “meatworkers”) as two occupations integral to animal-based

food production. Extant work regarding meatworkers has tended to focus on either the psychological well-being of workers (e.g., Dillard, 2008) or the potential health hazards for consumers, given food chain concerns (e.g., Nowak, Sammet, Klein, & Mueffling, 2006).

Where attention has turned more toward the broader aspects of attitudes to animals within meat-working populations, the issues raised have been disturbing on both human and animal welfare fronts. In 2008, Dillard called for legal redress for “slaughterhouse workers” (commonly termed “meatworkers” in Australia/NZ) because of the psychological trauma caused by their daily experience of “large-scale violence and death” (p. 391) within an institutional culture that does little to reduce animal or human suffering. Vialles (2002) argues that during the 19th century there was a shift in public sensibilities toward the killing of animals for meat (and toward death more generally), which resulted in slaughter work being “banished” from the city to the outskirts. Along with this banishment came various technological inventions that allowed larger-scale slaughtering, while also facilitating its “invisibility.” As a result those who worked in abattoirs became “condemned to an existence on the fringes of urban and rural society” (p. 27). For Vialles this led to slaughterhouse workers being both ignored and reviled, subject to a liminal existence that has continued into present times. Arguably, this liminality enables other forms of oppression to manifest for the workers (see Purcell, 2011; Fitzgerald, 2010). Indeed, several authors have pointed to the human suffering endemic to slaughterhouse work (e.g., Eisnitz, 2007; Bull & Broadway, 2003), as well as its intersections with gendered and racialized discrimination (e.g., Cudworth, 2011; Purcell, 2011; Le Duff, 2003), which creates alienation among workers and further contributes to their poor working conditions. Authors have also been quick to point out that the repetitive nature of slaughterhouse work, coupled with the modern cultural sensibility that dictates a need to “render invisible what used to be a bloody spectacle” (Vialles, 2002, p. 66), leads to a “thought vacuum and . . . lack of identification with one’s job that are elsewhere experienced as distressing features of production line work, [but that] here constitute on the contrary a prerequisite for ‘getting used to it’” (Vialles, 2002, p. 51).

Some have argued that it is not surprising, then, that this kind of human suffering gives rise to animal suffering. Indeed, Porcher (2011) argues that animals and humans share in physical and mental suffering as a result of modern intensive farming practices that include, but are not limited to, the meatworks. Both Dillard (2008) and Grandin (1998) assert that abuse of animals at meat processing plants occurs frequently. For example, when Grandin (1998) undertook surveys of meat-processing plant employees in the United States, she found that approximately 4% of employees directly involved with

livestock had committed acts of deliberate animal cruelty in the course of their work. She further added that it appeared that these individuals took pleasure in observing the animals' suffering. Dillard (2008) suggests that employment within the animal production industry (specifically as farmers and meatworkers) tends to lower "employees' ability to empathize and identify with the pain suffered by the animals whose lives (and deaths) they are controlling" (p. 399). Dillard further explains that this type of distancing and compromised/poor attitude toward animals affects the way workers treat the animals they interact with, and specifically that this "disconnect" increases the likelihood of deliberate cruelty. She also suggests that this emotional distancing potentially affects male employees more strongly than female employees (based on findings from Porcher et al., 2004).

While many of these issues obviously need to be addressed from an animal welfare perspective, research into the human-animal violence link would suggest that these issues need to be addressed from a human-welfare perspective as well. That is, research has strongly indicated that correlations exist between an individual's treatment of animals and his or her treatment of humans (a.k.a. the "Link"; e.g., Ascione, 1998; DeViney, Dickert, & Lockwood, 1983), specifically identifying a negative correlation between scores on measures designed to assess participants' attitudes to animals and propensity for interpersonal aggression (e.g., Taylor & Signal, 2004). For example—and particularly relevant to the current study—Signal and Taylor (2012) aimed to evaluate the link between attitudes toward animals, propensity for aggression, and human-directed empathy within a large, normative, community sample of 598 participants. Participants completed the Aggression Questionnaire (AQ; Buss & Perry, 1992), the AAS, and a human-directed empathy measure (Interpersonal Reactivity Index [IRI]; Davis, 1980) during a phone interview (Signal & Taylor, 2012). The results indicated that those who had higher propensities for aggression (regardless of gender) also tended to hold more negative attitudes toward animals and lower overall human-directed empathy. The correlation between Physical Aggression (one subscale of the AQ) and AAS was the strongest, particularly for males. This may reflect a commonly found sex difference within aggression research, namely that on measures like the AQ, sex differences tend to be apparent within the Physical Aggression but not the Verbal Aggression, Anger, or Hostility subscales (i.e., males are generally found to score more highly than women on Physical Aggression but not on the other scales; e.g., Condon, Morales-Vives, Ferrando & Vigil-Colet, 2006).

Evidence suggests that there may be higher incidences of familial violence as well as other crimes and social problems among populations of meatworkers

(e.g., Dillard, 2008; Artz, Orazem, & Otto, 2007). For example, the establishment and/or presence of a (large) meat-processing plant in a number of rural American towns has been reported to be connected to increases in homelessness, crime, familial violence, and child abuse within the community. Fitzgerald, Kalof, and Dietz (2007) summarize the existing literature (both popular and academic) on this issue, suggesting that three factors are often linked with the observed increase in criminal behavior: pressure on existing social infrastructures resulting in social disorganization, demographic characteristics of the workforce (young, male, and often immigrant), and increased unemployment rates (due to high staff turnover). However, as noted by Fitzgerald et al., none of these factors have been empirically tested. Indeed, when the authors examined arrest rates across a number of communities, comparing situations where either a large animal-processing facility was present or a large-scale manufacturing plant (with a similar size workforce and comparable demographic factors), they reported that the three factors did not, on their own (or in combination) account for the increase in total arrest rates. Increases in arrests for violent crime (including rape and other sex offenses) were only observed in communities surrounding meatworks. Fitzgerald et al. conclude that there is sufficient evidence to support the existence of the “Sinclair Effect”—i.e., that the unique and violent nature of the work involved has a deleterious effect on employees and, in turn on society in general (2007).

At face value it also seems that there are a number of reasons why the attitudes toward animals of individuals engaged in the meat-processing industry may differ from those of individuals engaged in other occupations (including livestock farmers). As discussed previously, it seems reasonable to hypothesize that, in order to carry out their duties, individuals who work in meat-processing plants must develop an emotional distance from the animals being processed. However, to date there is no empirical evidence that can validate such a hypothesis, and no research has focused specifically on the issues of propensity for aggression and attitudes toward animals in the employee population of the meat-processing industry. The lack of empirical research in this area may be attributed to difficulties in reaching participants who are engaged in the meat-processing industry (for a number of reasons, including language, literacy, access, etc.). However, given the existing and emerging research regarding the links between interpersonal violence and negative attitudes toward animals and the inherent problems that these issues pose for society, this area is worthy of a great deal of further attention.

Given the lack of existing research and the potential ramifications for both human and animal welfare, then, there is a particular need to begin gathering reliable data in order to benchmark attitudes toward animals within both

farming and meat-working populations. Furthermore, there is a need to compare these attitudes with measures of human-directed, interpersonal aggression, given the concept of the “Link.” Thus, the aims of the current pilot project were to assess attitudes toward animals and a range of demographic factors and propensity for aggression within two “primary industry” occupations, namely farmers and meatworkers.

Therefore, the main hypotheses of the current project were:

1. Those employed within “primary industries” will score significantly higher on aggression (AQ) and lower on attitude toward animals (AAS) measures, regardless of the nature of occupation within the sector, compared to a community “benchmark.”
2. Those employed as meatworkers will score significantly higher on the AQ and lower on the AAS compared to both farmers and general community samples.

## **Method**

### *Participants*

Utilizing a snowball recruitment technique (beginning with personal contacts of the first author) 41 farmers (mean age = 51 years; 22 men and 19 women) and 26 meatworkers (mean age = 36 years; 14 men and 12 women) completed the current questionnaire. For both groups there was no significant difference in age as a function of gender. Where a participant indicated experience working in both occupations, current occupation determined group membership. The community “norms” presented as comparison values throughout subsequent analyses were drawn from a larger study that assessed links between empathy, aggression, and attitudes to animals within a randomly selected community sample ( $N = 550$ ; average age 48.4 years) using the same psychometric tools as the current sample (details below). These values were utilized here, as they made for a more relevant comparison than AAS/AQ scores derived from non-Australian populations. For further details of AAS-related findings, see Signal and Taylor (2006a).

### *Materials*

The questionnaire package given to participants in the current study included: general demographic questions (age, gender, etc.); a series of occupation-specific questions for individuals engaged in either farming or meat processing

(e.g., length of time in industry, position held [i.e., boner, packer, livestock vs. crops, etc.]); a measure of propensity for aggression (AQ—details below); and a modified, Australia-relevant version of the AAS (as used in Signal & Taylor, 2006a). Along with the questionnaire the participants were provided with an information sheet, a consent form, and a stamped envelope printed with the researcher's postal address.

*Propensity for Aggression.* The AQ (Buss & Perry, 1992) measures propensity for aggression through self-reported aggressive feelings and behaviors. The AQ consists of 29 items that comprise four factors measuring propensity for Physical Aggression (PA), Verbal Aggression (VA), Anger (A), and Hostility (H). Researchers have reported that this four-factor model fits data from diverse populations well (e.g., Fossati, Maffei, Acquarini, & Ceglie, 2003; Harris, 1995) and that these four factors may reasonably be combined into a higher-order measure of propensity for aggression (with subscale correlations ranging from .25 to .48; Buss & Perry, 1992). However, it must be noted here, as mentioned previously, that sex differences are commonly found within the subscales (i.e., men are consistently found to score higher than women, particularly on the PA subscale; e.g., Condon et al., 2006). Thus individual subscales within the AQ may provide more detailed information than the overall score (García-León et al., 2002). Participants are required to indicate how characteristic each item was of them on a five-point Likert scale, which ranges from "extremely characteristic of me" to "extremely uncharacteristic of me." Possible scores range from 29 to 145, with higher scores indicating higher propensity for aggression. This scale has been shown to have moderate to high reliability and good convergent validity (e.g., Harris, 1997).

*Attitude toward Animals.* The AAS (Herzog et al., 1991) measures individual differences in attitudes toward the treatment of animals (Mathews & Herzog, 1997). The AAS consists of 20 statements that are rated by respondents on a five-point Likert scale, from "Strongly Disagree" to "Strongly Agree." The possible scores on this scale range from 20 to 100. A high score on this scale is indicative of pro-welfare attitudes toward animals. Mathews and Herzog reported that the scale has been found to have high internal consistency (Cronbach's alpha = 0.91). Slight modifications were made to this questionnaire to make it more applicable to an Australian setting—for example, "kangaroo" was substituted for "mink" and "raccoon" in item 4.

Participants were required to complete the consent form and questionnaire and return them to the researcher through the post using the envelope provided. Consent forms were detached from the completed questionnaires prior to data entry. All responses were then entered into SPSS.

## Results

Raw data from 67 individuals currently employed as either farmers or meatworkers (Meatworkers  $n = 26$ ; Farmers  $n = 41$ ) were entered into SPSS v. 16 with negatively coded items in the AAS and AQ recoded (reverse scored) prior to analysis. Initial data checking including normality assumptions and scale reliability indicated that both the AAS and the AQ met normality assumptions and had high levels of reliability (Cronbach  $\alpha = 0.874$  and  $0.927$  respectively; PA = 0.826, VA = 0.794, A = 0.817, H = 0.820). Missing value analyses determined that fewer than 3% of AAS and AQ scores were missing, and, as these met the criteria for randomness or MCAR (Little's MCAR, AAS:  $\chi^2 = 67.07$ ,  $P = 0.093$ ; AQ:  $\chi^2 = 144.85$ ,  $P = 0.328$ ), the missing values were replaced with Estimated Means on a case-by-case basis to maximize usable data. Because of the relatively small sample size of the current project, multivariate regression and similar analyses were not attempted.

The overall (i.e., meatworkers and farmers combined or “primary industry”) average AAS score for the current sample was 60.5 ( $SD = 10.8$ , significantly lower than was found within the comparison community sample,  $t[66] = -5.426$ ,  $P = 0.000$ ), while the average AQ score was 67.8 ( $SD = 20.0$ , not significantly different from that found within the community sample,  $t[65] = -0.728$ ,  $P = 0.469$ ). Presented in Table 1 are the AAS and AQ (including subscale) scores derived from the current sample, broken down by occupation. Also presented (for comparison purposes) are the AAS and AQ scores obtained from a large, geographically related, community sample ( $N = 612$ ; see Signal & Taylor, 2006a, for more detail) two years earlier.

As expected, both farmers and meatworkers scored significantly lower on the AAS than was previously found within a general community sample (Farmers:  $t[40] = -3.270$ ,  $P = 0.002$ ; Meatworkers:  $t[25] = -4.947$ ,  $P = 0.000$ ), with no significant difference found between the AAS scores for farmers and meatworkers ( $t[65] = 1.240$ ,  $P = 0.219$ ,  $d = 0.32$ ). There was, however, a significant difference between the two for overall AQ scores ( $t[64] = -3.549$ ,  $P = 0.001$ ,  $d = -0.89$ ), with meatworkers having significantly higher propensity for aggression (AQ) than farmers. Interestingly, farmers were found to have significantly lower total AQ scores ( $t[39] = -3.024$ ,  $P = 0.004$ ) than the general community, while meatworkers scored significantly higher ( $t[25] = 2.086$ ,  $P = 0.047$ ). Indeed, a general pattern can be seen whereby farmers and meatworkers from the current sample “bracket” the AQ and AQ subscale scores found for the general community, with farmers tending to score lower, and meatworkers higher, than the community average. More specifically, farmers and meatworkers were found to differ significantly from each other on all but

**Table 1. AAS and AQ Scores from Farmers and Meatworkers**

	Community (Signal & Taylor, 2006a)	Primary Industry	
		Farmers	Meatworkers
<b>AAS</b>	67.6 [9.3]	61.8 [11.4]	58.4 [9.5]
<b>AQ<sub>TOTAL</sub></b>	69.6 [4.0]	61.3 [17.4]	77.8 [19.5]
AQ <sub>PA</sub>	20.0 [5.3]	17.8 [6.1]	23.2 [7.9]
AQ <sub>VA</sub>	13.1 [2.5]	12.0 [4.1]	14.0 [3.9]
AQ <sub>A</sub>	17.0 [3.8]	14.4 [4.8]	18.0 [6.1]
AQ <sub>H</sub>	19.6 [4.3]	17.1 [5.5]	22.7 [5.9]

NB: [St. Dev]

the Verbal Aggression subscale of the AQ (which approached significance  $P = 0.053$ ), with meatworkers having higher propensity for Physical Aggression ( $F[1,66] = 9.715, P = 0.003$ ), Anger ( $F[1,66] = 7.145, P = 0.009$ ), and Hostility ( $F[1,65] = 15.343, P = 0.000$ ).

While the type of farming engaged in (coded as “Livestock” [ $n = 20$ , all outdoor graziers for meat] vs. “other” [ $n = 16$ , mainly horticulture/crops]) was found to have no significant effect on AAS or AQ scores, there was a trend for livestock farmers to have higher overall AAS scores (65.1 vs. 58.3 ( $t[39] = 1.984, P = 0.054$ )) than nonlivestock farmers. In contrast, the position in which the individual was employed within the meatworks (e.g., kill floor vs. office) had a significant effect on AQ scores ( $F[4,25] = 3.930, P = 0.022$ ), with the highest propensity for aggression being seen in those involved in “load out” (95.5), followed by those on the “kill floor” (86.3). However, it must be noted here that only two participants (7.6% of the meatworkers sample) were employed in “load out” (the handling of cut/dressed carcasses); thus, this particular pattern needs to be interpreted with caution. Interestingly, although not significant ( $F[3,25] = 2.517, P = 0.085$ ), there were notable differences in overall AAS scores dependent on the type of meatwork in which the individual primarily engaged, with those working in the boning room having lower average AAS scores than those working on the kill floor.

#### *Effect of Demographic Variables on Overall AAS/AQ*

Although time employed within the farming sector had a significant effect on average AAS scores ( $F[3,39] = 2.939, P = 0.046$ ) and AQ scores ( $F[3,38] = 4.649, P = 0.008$ ), respective time as a meatworker did not (AAS [ $F(3,25) =$

2.321,  $P = 0.103$ ]; AQ [ $F(3,25) = 0.060$ ,  $P = 0.980$ ]). However, for both there was a trend for the highest AQ scores (and lowest AAS scores) to be associated with those who had been employed within the industry for less than two years. One obvious confound for “time employed in sector” is that of participant age, and, as expected, there was a positive (and significant) correlation between age and time employed within both sectors (Farmer:  $r = 0.505$ ,  $P = 0.000$ ; Meatworker:  $r = 0.583$ ,  $P = 0.000$ ). What was unexpected, however, was the finding that participant age (as an independent variable) had a significant effect only upon overall AQ scores (with those under 25 years of age having significantly higher AQ scores than the rest of the sample, regardless of gender,  $P = 0.228$ ). This suggests that elevated propensity for aggression may be more prevalent within the younger participants, regardless of occupation (or task therein). While this is not an uncommon finding, the fact that the difference only showed within the aggregate total score is noteworthy.

Education level was found to have no significant main effect on AAS or AQ scores for farmers (AAS:  $F[5,40] = 0.678$ ,  $P = 0.643$ ; AQ:  $F[5,39] = 0.750$ ,  $P = 0.592$ ) and no significant effect on AQ scores for meatworkers ( $F[4,25] = 0.637$ ,  $P = 0.642$ ). However, there was a significant difference in AAS scores for meatworkers ( $F[4,25] = 3.423$ ,  $P = 0.026$ ), with those with a tertiary education (31% of subsample) registering substantially lower scores than those with a primary or secondary level of education. A Chi-square test of independence indicated that level of education was independent of type of employment within the subsample ( $\chi^2 = 9.692$ ,  $P = 0.643$ ). That is, those participants with a tertiary education were as likely to be employed on the boning floor as in the office (for example).

Income was found to have no significant effect on AAS or AQ scores for either farmers or meatworkers (AAS:  $F_{FARMERS}[3,38] = 0.892$ ,  $P = 0.455$ ;  $F_{MEATWORKERS}[2,25] = 0.889$ ,  $P = 0.425$ ; AQ:  $F_{FARMERS}[3,37] = 0.055$ ,  $P = 0.983$ ;  $F_{MEATWORKERS}[2,23] = 0.102$ ,  $P = 0.903$ ). Having a companion animal currently was also found to have no significant effect on AAS or AQ scores for either subsample. Worthy of note, however, is the pattern of companion-animal keeping—that is, while 76% of farmers reported currently having a companion animal, only 54% of meatworkers reported the same. The majority of meatworkers who did have a companion animal had been employed within the sector for fewer than five years ( $\chi^2 = 9.692$ ,  $P = 0.643$ ).

### *Effect of Gender on Overall AAS/AQ*

Since one of the most stable effects seen in animal studies research is that of gender (e.g., women consistently score higher on the AAS; Herzog, 2007),

**Table 2. AAS and AQ Scores from Farmers and Meatworkers as a Function of Gender**

	Community (Signal & Taylor, 2006a)		Primary Industry: Farmers		Primary Industry: Meatworker	
	Male	Female	Male	Female	Male	Female
<b>AAS</b>	63.8 [8.7]	69.5 [9.1]	64.8 [10.7]	58.2 [11.4]	60.5 [7.5]	56.0 [11.2]
<b>AQ<sub>TOTAL</sub></b>	73.4 [4.1]	67.7 [3.8]	67.4 [17.2]	54.5 [15.2]	76.1 [19.5]	79.8 [21.4]
<b>AQ<sub>PA</sub></b>	22.5 [5.7]	18.8 [4.7]	20.2 [6.5]	15.1 [4.3]	22.2 [7.2]	24.3 [8.8]
<b>AQ<sub>VA</sub></b>	13.7 [2.7]	12.7 [2.4]	12.5 [4.5]	11.5 [3.6]	13.4 [4.3]	14.8 [3.3]
<b>AQ<sub>A</sub></b>	17.3 [3.8]	16.8 [3.9]	16.0 [4.6]	12.6 [4.3]	17.4 [5.9]	18.7 [6.5]
<b>AQ<sub>H</sub></b>	20.0 [4.4]	19.4 [4.3]	18.6 [4.3]	15.4 [6.2]	23.1 [6.2]	22.2 [5.7]

NB: [St. Dev]

this demographic variable was examined independently of the variables discussed above. Given Signal and Taylor's (2006a) findings (i.e., no significant interaction between gender and occupation within AAS scores) within their general community sample or, more specifically, within the primary industry subsample (of the community sample), it was expected that a similar pattern would emerge (that is, women would score higher on the AAS and lower on the AQ than men within each grouping). As is apparent in Table 2, however, there is a marked (and significant) gender difference for the AAS ( $t[65] = 2.260$ ,  $P = 0.027$ ), with women (regardless of employment as farmers or meatworkers) scoring, on average, lower on the AAS than men (57.4 vs. 63.1, respectively) in the current sample.

While men were found to have higher average AQ scores than women within the current sample (63.1 vs. 57.4, respectively) this difference was non-significant ( $t[64] = 1.336$ ,  $P = 0.186$ ). Within the farming subsample, men were found to have significantly higher AQ scores than women (also employed as farmers,  $t[38] = 2.501$ ,  $P = 0.017$ ,  $d = 0.8$ ). Contrary to expectations, however, women employed as meatworkers had higher average AQ scores than (a) males employed as meatworkers (79.8 vs. 76.1, *ns*); (b) farmers (79.8 vs. 61.3, regardless of gender, [ $t(11) = 3.006$ ,  $P = 0.012$ ]) and (c) general community members (regardless of gender, 79.8 vs. 69.6, *ns*, and compared with women from the general community, 79.8 vs. 67.7, *ns*). Although only the comparison between AQ scores for women employed as meatworkers and AQ scores for farmers (regardless of gender) proved significant, the others approached significance and may have proved so with a larger sample.

## Discussion

The main aim of the current study was to investigate the interaction between occupation class (i.e., “primary industry,” here divided into “farmer” and “meatworker”), attitudes toward animals, and propensity for aggression. In line with previous research (e.g., Signal & Taylor, 2006a; Kellert, 1980), it was predicted that those currently employed within the primary industry sector (regardless of “farmer” or “meatworker” classification) would have significantly lower attitudes toward the treatment of animals (as measured by the AAS; Herzog et al., 1991) and significantly higher propensities for aggression than that found in a (geographically) related community sample. This hypothesis was only partially supported, with those in the current sample scoring significantly lower on the AAS than found previously. However, no significant difference between the current sample and the community “benchmark” was seen within the total propensity-for-aggression measure (AQ; Buss & Perry, 1992).

It was further predicted that an individual’s current type of employment within the sector (namely farmer or meatworker) would have a differential effect on AAS and AQ scores, given recent suggestions (e.g., Dillard, 2008; Fitzgerald et al., 2007; Porcher, 2006). Although farmers and meatworkers were found to have significantly lower overall AAS scores than was found within the general community sample, there was no significant difference between the two subgroups. These AAS scores were also similar to those reported by Signal and Taylor (2006a) within a primary industries cohort. As has been previously mentioned, individuals employed within these occupational fields tend to display more utilitarian attitudes toward animals, and, by virtue of their occupations, view animals as commodities. A written comment (on the survey document) from one of the meatworker participants regarding the AAS item “*Breeding animals for their skins is a legitimate use of animals*” provides a clear indication of this utilitarian view; the participant agreed with the statement, “provided there is no waste of the rest of the animal.”

There was a clear and significant difference, however, between farmers and meatworkers on propensity-for-aggression (AQ) scores, suggesting that occupation type within the overall class of primary industry had a significant effect on propensity for aggression. Specifically, those employed as meatworkers had substantially higher AQ scores than farmers (with the largest differences seen within the Physical Aggression and Hostility subscales). Worthy of note is the fact that these meatworker overall AQ and PA scores are high and are similar to some reported for incarcerated populations of both genders (e.g., Williams, Boyd, Cascardi, & Poythress, 1996). Not only does this provide some support

for assertions by Dillard (2008) about the potential psychological damage done to employees within meat processing plants (e.g., due to constant exposure to violence and the type of institutional climate present), it also corresponds well with Fitzgerald et al.'s (2007) findings of a differential effect on violent crime rates by employment within a meat processing facility. This is clearly an area in need of further investigation, as it has implications not only for the welfare of individuals (both human and nonhuman), but for the communities that surround such facilities (and that presumably supply the labor for them).

Interestingly, and contrary to expectations, farmers were found to have lower overall AQ (total and subscale) scores than those found within the community sample. While the reason for this is unclear, on face value there appear to be a number of factors associated with both work environments that may play a part in influencing propensity for aggression of individuals engaged in these related, but very different, occupations. Although farmers today work long hours and may experience considerable financial pressures (e.g., Porcher, 2006) the "farming" lifestyle (at least in Australia) is relatively independent and flexible (at least in terms of work schedule). In contrast, the meat industry is characterized by unpleasant work, difficult workplace relations and a work environment that is often pressured and dangerous, that places a high emphasis on throughput, and that involves working as part of a production line (e.g., Dillard, 2008).

Although the type of farmer (i.e., livestock vs. other) had no differential effect on AAS or AQ scores (despite a trend toward higher AAS scores for livestock farmers), type of employment as a meatworker did. Because of the small numbers within each meatworker employment type (particularly those on the "kill floor" and "load out"), only limited conclusions can be drawn regarding the influence of task. However, there is sufficient evidence to suggest that the type of task engaged in within the overall rubric of "meatworker" has a differential impact on measures such as AAS and AQ. Hence it is possible that in a larger, more representative sample of those employed within the meat-working industry, average AAS and AQ scores may be more extreme than found here.

### *Gender and Occupation*

Within and across groupings (i.e., primary industry combined and farmer, meatworker separately), it was anticipated that the commonly found gender differential would hold true—i.e., women would have more pro-animal welfare attitudes (e.g., Herzog, 2007) and an overall lower propensity for

aggression than men (specifically PA; e.g., Gerevich, Bacskai, & Czobor, 2007; Archer, 2004), regardless of employment classification. This was not the case, however, with women from the current primary industry sample (regardless of classification) scoring significantly lower on the AAS than their male counterparts and lower than male and female community members. Equally unexpectedly, women who identified as being employed as meatworkers were found to have higher propensities for aggression (particularly physical and verbal aggression) than males employed as meatworkers and than farmers (regardless of gender). This surprising result suggests that, despite assertions (e.g., Dillard, 2008) that males would be more affected by the type of work implicated within meatwork, female employees may be equally at risk for emotional and psychological sequelae of this type of work. It should be noted that within this (small) sample, female participants were of a similar age (i.e., average age 32 compared to 38 years old,  $P = 0.088$ ), and as likely to be employed within the production chain (particularly the boning room) as the male participants. Given that, in Australia, over 80% of meatwork employees are male (Australian Productivity Commission, 1998), it would be interesting to see whether this pattern (of women being equally employed across the “chain”) holds in other locales/countries. However, given that the extant literature surrounding the negative effects of meatwork/slaughterhouse employment focuses exclusively on male experiences (as does most of the literature on farmers), this is an area in desperate need of further investigation.

The current findings also present a challenge to the gendered assumptions behind some of the work done in human-animal studies. For instance, there seems to be an assumption in human-animal studies that males predominantly abuse animals while women neglect/hoard them—an assumption that is reflected in (and caused by?) the vast number of studies that investigate animal abuse occurring within male-only samples (see Herzog, 2007, for a review of studies of human-animal interactions and gender). This is particularly the case within research into the human-animal abuse link and especially research involving retrospective accounts of abuse committed by incarcerated individuals as a predictor of human-human violence (e.g., Tallichet, Hensley, O’Byrne, & Hassel, 2005). In one notable exception to this focus, Felthous and Yudowitz (1977) found that a self-reported history of cruelty to animals was significantly related to assaultive convictions for female offenders (along with experience of severe paternal “discipline”), as well as for male offenders. Given that researchers are suggesting that gender roles are not only dynamic but that what is considered “masculine” and/or “feminine” has been converging over the past 50 years (and will continue to do so; e.g., Diekmann & Eagly, 2000), it would seem that the intersection between gender and animal

attitudes/experience of animal cruelty (both witnessing and perpetrating) warrants further attention.

One of the implications from the current study is that there is a need for ever more sophisticated and sensitive research instruments within human-animal studies. Not only should we consider more sensitive instruments to measure attitudes toward animals, but we should also be attentive to the mistake of collapsing multiple groups (in this case, by occupation) together. It is clear from the current research that there are differences between those who work with animals as livestock and those who work with animals in a meat-processing capacity. Future research must be attentive to this difference. Similarly, future research also needs to be attentive to the fact that attitudes toward animals on the farm may also change with the changing role of the animal at any given time. For example, as Wilkie (2005) points out, farmers are expected to display “concerned detachment” toward store stock but are able to develop “concerned attachment” for breeding stock (p. 218). There is thus an ever-present ambiguity for farmers in their relationships with farm animals because of the differing roles of the animals, which, presumably, is absent for those in a context where all the animals will be processed (fairly immediately) as meat. While this issue needs to be addressed at a design level—i.e., by ensuring that occupational categories are not conflated—it also needs to be addressed at the instrument level. For example, farmers in the current study were found to have higher AAS scores than those in the general community in a comparison population. Given that previous studies have shown that farmers adopt a utilitarian approach toward animals (e.g., Signal & Taylor, 2006a; Kellert, 1980), this may well indicate that the AAS, despite being seen as a measurement of overall attitudes toward the treatment of animals, actually assesses utilitarian attitudes toward animals.

Despite the admittedly small sample size of the current study (which is an obvious limitation), it presents a preliminary exploration of meatworker and farmer attitudes regarding animals and propensity for aggression, which served to test some initial hypotheses and point the way toward a need for further studies that adopt a refined methodology and/or sample focus based on the current findings. While meatworkers are a population that is hard to access (for a number of reasons, including gender, literacy levels, industrial culture, etc.), further research with this population is urgently needed, given suggestions by various authors outlining the potential socio-psychological effects of being employed within the industry for individuals, the community they reside in, and the animals with whom they come into contact (e.g., Dillard, 2008; Fitzgerald et al., 2007; Porcher, 2006). Finally, given the recent attention given to animal processing in the Australian press (e.g., Four Corners,

2011) and the overwhelming public response, it is clear that this is an issue of great interest to the public and policy makers alike, and there is thus a need for empirical work that attempts to unpack the multiple issues linked to animal processing.

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