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M. G. S. McKendree, C. C. Croney and N. J. Olynk Widmar

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# BIOETHICS SYMPOSIUM II: Current factors influencing perceptions of animals and their welfare<sup>1</sup>

M. G. S. McKendree,\* C. C. Croney,<sup>†2</sup> and N. J. Olynk Widmar<sup>‡</sup>

\*Department of Agricultural Economics, Kansas State University, Manhattan 66506; <sup>†</sup>Department of Animal Science, Purdue University, West Lafayette, IN 47907; and <sup>‡</sup>Department of Agricultural Economics, Purdue University, West Lafayette, IN 47907

**ABSTRACT:** To address escalating concerns about livestock animal care and welfare it is necessary to better understand the factors that may predispose people to develop such concerns. It has been hypothesized that experiences with, beliefs about, and emotional connections to animals may influence level of perceived obligation toward and therefore concern for animals. However, the extent to which people's classifications of animals and their status as pet owners may impact their views on food animal care and welfare practices remains unclear. An online survey of 798 U.S. households was therefore conducted in June 2012 to understand differences in consumer sentiment towards various animal species, classification of certain species (as pet, livestock or neither), and variations in food animal welfare concerns between dog and/or cat owners and those who do not own such species. Sixty-six percent of households in the survey owned at least 1 animal. Forty-eight percent owned dogs, 41% owned cats, 3% owned horses, and 10% owned other animals. As expected, dogs and cats were classified by most respondents (90%) as pets. Most respondents similarly categorized rabbits (58%) and horses (55%) as pets, although consensus was not found for horses with 27%

classifying them as livestock animals and 18% as neither pets nor livestock. Over 80% of respondents classified beef cows, dairy cows, pigs, chickens, and turkeys as livestock. The majority of survey respondents were opposed to eating cats and dogs followed closely by horses due to ethical and/or spiritual reasons. Dog and/or cat owners more often reported having a source for animal welfare information (68%) than those who did not own these species (49%). Additionally, dog and/or cat owners were more concerned about food animal welfare for both domestically raised food animals and those raised outside the United States (dog and/or cat owners mean level of concern was 3.88 for domestic animal welfare and 5.16 for those raised outside the United States compared with non-dog or -cat owners with means of 4.46 and 5.46, respectively). Although a causal relationship cannot be established, pet ownership and increased concern for food animal welfare appear to be correlated. These data suggest that increased interest in protecting food animals may stem from interactions with and emotional connections to pets, especially when combined with other factors such as having a source for animal welfare information, education level, age, and gender.

**Key words:** animal welfare, ethics, livestock, pets, perceptions

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## INTRODUCTION

The ethical justification for large scale, industrialized animal agriculture (currently the predominant model of animal production in the United States and other developed western nations) is increasingly a

point of social debate. This type of modern animal production faces significant opposition from animal protectionists, environmentalists, members of the human health community, and a growing number of consumers. Concerns include the safety and quality of foods derived from such systems, the environmental and human-health impacts of intensification, and the welfare of animals used for food (Croney et al, 2012). The well-being of food-producing animals has received significant scrutiny and media coverage in recent years, resulting in heightened public attention and ongoing attempts to more stringently regulate farm animal care.

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<sup>2</sup>Corresponding author: ccroney@purdue.edu

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As interest in ensuring the well-being of animals grows in the United States, understanding the reasons for people's concerns about how farm animals are treated in modern production becomes a critical step toward addressing them. A number of factors appear to be linked to increased emphasis on food animal welfare. Among these is the lack of direct connection most people have to how their food is produced and what appears to be growing interest in changing this paradigm. The progressive expansion of circles of moral consideration to people who were historically excluded, such as women and minorities, which in recent years has been further extended to include nonhuman animals (Croney and Botheras, 2010), has also contributed to broad public interest in animal treatment.

The objectives of this study were to determine 1) how people classify animal species, 2) to what extent classification of species and/or animal ownership impacts opposition to eating certain species, 3) the level of concern people express about specific farm animal management practices, and 4) the interrelationships between these investigated characteristics and animal welfare concern.

### MORAL CONCERN FOR ANIMALS

Moral concern for animals can be linked to the idea of a "social contract" between animals and humans, which has been debated for many years (Larrère and Larrère, 2000; Te Velde et al., 2002; Rollin, 2004). Recent interpretations of such social contracts may be due to the evolution of philosophical views relating to acceptable use of animals, ranging from animal exploitation to animal rights (Croney and Botheras, 2010). Other work indicates that a contract exists between humans and domesticated animals; however, consumers and farmers have differing views on human obligations to animals (Te Velde et al., 2002; Croney and Anthony, 2011). Moreover, evidence that some consumers feel some moral obligations towards animals is evident via the growth of specialty food labels indicating "humane" treatment of animals, the significant membership of animal protectionist organizations, such as the Humane Society of the United States (HSUS) and People for the Ethical Treatment of Animals (PETA), and attempts to legislatively increase protection offered to animals via recent U.S. state ballot initiatives (Croney et al., 2012). Further evidence includes modifications of the Animal Welfare Act to increase species coverage (U.S. Code Title 7, 2009) and legislation to regulate commercial breeding of dogs (Wisch, 2012), equine slaughter (Lenz, 2009), and the use of nonhuman primates in biomedical research (Balcombe et al., 2011). Furthermore, terming owners of companion animals as "guardians" (Carlisle-Frank and Frank, 2006) may influ-

ence people's perceptions of the human-animal bond, at least for certain animal species.

These changing views may be connected to the growing body of literature relative to animal behavior, especially animals' mental capabilities. For example, it is hypothesized that people's perceived obligations to animals may be at least partly based on beliefs about animal mental capabilities (Davis and Cheeke, 1998), which are often tied to their degree of interaction with animals. Empirical evidence of animal intelligence and other mental abilities is likely to be found by laypersons given that most people's relationships with animals derive from their experiences with animals in the media and those encountered at zoos and from interactions with companion animals (Croney and Botheras, 2010).

In addition, the strength of the human-animal bond is likely to influence people's thought processes about how animals ought to be treated, for as people form close emotional connections to animals they categorize as companions, it is probable that those relationships may influence how they think about, view, and value other animals, including those used for food (Croney and Botheras, 2010). Thus, concerns about how livestock animals are treated and beliefs about how they ought to be cared for may be rooted, at least in part, in beliefs about companion and other animals (Croney and Botheras, 2010). Consequently, many questions related to factors that influence consumers' concerns and perceptions about obligations to animals classified in different ways, for example, as livestock or as companions, remain unanswered.

### MATERIALS AND METHODS

In-depth analyses of data derived from an online survey, administered in June 2012, were conducted to understand differences in consumer sentiment towards various animal species, classification of certain species (as pet, livestock, or neither), and variations in animal welfare concerns between dog and/or cat owners and non-dog or -cat owners. Survey respondents were recruited from a large opt-in panel by Survey Sampling International (Shelton, CT), which was representative of the U.S. population (in terms of U.S. state of residence, gender, age, income, and level of education), at least 18 yr of age and familiar with their household's food purchasing behaviors. Decipher, Inc. (Fresno, CA), a marketing research services provider specializing in online survey programming and administration, was used to conduct the online survey. Internet surveys are increasingly used because of their speedy completion times and relatively low costs (Louviere et al., 2008; Gao and Schroeder, 2009; Olynk et al., 2010; Tonsor and Wolf, 2010; Olynk and Ortega, 2013). Furthermore, internet surveys do not exhibit non-response bias (Hudson et al., 2004).

General information regarding households' demographic characteristics was collected in addition to animal ownership. Due to the recent media attention on livestock housing, especially with respect to cage and crate housing systems for pigs and chickens, dog and cat owners were also asked if they confined their cats and/or dogs to a cage, crate, or kennel. In addition, because animal classification has the potential to influence one's perceived moral obligations to animals, respondents were asked to classify 13 different animal species (i.e., cat, dog, beef cow, dairy cow, etc.) as pets, livestock, or neither. Respondents were also asked if they were opposed to eating, for ethical and/or spiritual reasons or for nonethical or nonspiritual reasons (e.g., taste, texture), different animals and animal products and whether they were opposed to other people eating the same animals and animal products. The animals and animal products investigated were dog, cat, horse, beef cow, dairy cow, pig, chicken, turkey, rabbit, sheep, goat, duck, geese, shellfish, finned fish, and milk and dairy products. For the survey, in its entirety, see McKendree (2013).

To address the research questions, relevant survey data obtained during previous studies (McKendree, 2013; McKendree and Widmar, 2013) were analyzed with a specific focus on cat and/or dog ownership and views on animal welfare and the consumption of animal products. Where it was appropriate, previous findings, such as the familiarity with livestock agriculture of the general public, general levels of self-reported concern for animal welfare, and the sources of information on animal welfare used in the United States, were incorporated from McKendree (2013).

A total sample of 798 respondents was obtained. A necessary sample size to obtain statistically meaningful results was calculated to be 384 people, given the total number of U.S. households, 114,761,359 (U.S. Government Printing Office, 2009). The necessary total survey sample size ( $S$ ) was calculated as  $s = x/[1 + (x/P)]$ , in which  $P$  is the total size of the population from which the sample is being drawn (114,761,359) and  $x = Z \times Z\{[F \times (1 - F)]/(D \times D)\}$ , in which  $Z$  is the area under the normal curve corresponding to the desired confidence level (1.96, per a 95% confidence interval),  $F$  is the frequency of the factor in the study (0.5), and  $D$  is the maximum acceptable difference between the sample and population means (0.05). Accordingly, the sample of U.S. residents who completed the survey used for this analysis was more than adequate to offer insights into U.S. households. Cross-tabulations were used to investigate relationships by comparing responses amongst key questions (i.e., caging dogs and cats versus not caging, animal ownership, etc.). Statistically significant differences amongst responses (using a z-score in cross-tabulations) were identified using data analysis software via Decipher,

Inc. Specifically, to address the research questions outlined, relationships between animal ownership and care (for example, whether a respondent reportedly crated or caged their own animals) and concern for the welfare of livestock animals were investigated. Furthermore, cross-tabulations were used to investigate whether those respondents reportedly owning dogs and/or cats were significantly different from those without dogs or cats in terms of the sources they used to inform themselves about animal welfare, perceptions of livestock animal welfare, and opposition to eating various animal species.

## RESULTS AND DISCUSSION

### *Demographics and Animal Ownership*

Table 1 presents participants' demographic information for the entire sample as well as comparisons of demographic information across subsets of dog and/or cat owners and not dog or cat owners. Income, when converted to a continuous variable, resulted in a mean household income of US\$49,223, which is comparable to the median reported household income in 2011 of \$50,054 (DeNavas-Walt et al., 2012). According to the U.S. Census Bureau (2012), in 2010, 87% of Americans over the age of 25 were at least high school graduates and 30% had completed at least 4 yr of college. Our sample was slightly more educated with 97% graduating from high school and 33% receiving a bachelor's degree or higher.

Ownership of animals, especially companions, may potentially affect perceived obligations to other animals, such as livestock and poultry. A total of 530 (66%) households in the survey owned at least 1 animal. Out of the total sample of respondents, 386 (48%) households owned dogs, 324 (41%) owned cats, 20 (3%) owned horses, and 80 (10%) owned other animals. Additionally, all those who owned a horse also owned a cat and/or a dog. Other animals reported to be kept included fish, chickens, turtles, lizards, birds, ferrets, rabbits, goats, cows, deer, guinea pigs, snakes, hamsters, and mice. When analyzing demographic characteristics across the 2 subsets in Table 1, those who reported being dog and/or cat owners more frequently reported being female and younger in age and had larger households (more adults and children in the house), higher weekly food expenditures, and higher income levels than those who did not own a dog or cat.

### *Animal Classification*

It has been previously documented that people's classifications of animals and their perceptions of animal intelligence may influence the way they believe animals should be treated. Figure 1 details participants' classification of 13 different animals as pet, livestock, or

**Table 1.** Demographic information and summary statistics for entire sample ( $n = 798$ ) and subsets of dog and/or cat owners versus not dog or cat owners

Variable description	Entire sample, $n = 798$ A	Dog and/or cat owners $n = 518$ B	Not dog or cat owners, $n = 280$ C	Statistically significant difference between columns B and C
I am ____ years old	47	45	50	**
Male	48%	45%	53%	**
Adults in household	1.93	2.06	1.70	**
Children in household				
Under 3 yr	0.10	0.11	0.07	*
Ages 4 to 6	0.07	0.07	0.06	
Ages 7 to 9	0.08	0.09	0.05	**
Ages 10 to 12	0.08	0.11	0.04	**
Ages 13 to 15	0.10	0.13	0.03	**
Ages 16 to 18	0.07	0.09	0.03	**
Annual household pretax income				
Up to \$60,000	72%	67%	81%	**
\$60,000 to \$119,999	22%	27%	14%	**
\$120,00 or more	6%	6%	5%	
Education of survey participant				
Did not graduate from high school	3%	4%	3%	
Graduated from high school, did not attend college	23%	23%	22%	
Attended college, no degree earned	26%	24%	29%	*
Attended college, associates or trade degree earned	14%	16%	11%	**
Attended college, bachelor's (BS or BA) degree earned	23%	22%	24%	
Graduate or advanced degree (MS, PhD, or law school)	10%	10%	10%	
Other	1%	1%	1%	
Vegetarian	4%	4%	3%	
Vegan	2%	2%	2%	
Household weekly food expenditure	\$132.77	\$145.92	\$108.43	**

\*Significant at the 10% level; \*\*Significant at the 5% level.

neither. Not surprisingly, dogs and cats were classified as pets by over 90% of respondents. Rabbits (58%) and horses (55%) were classified as pets by the majority of respondents. Additionally, 27% of respondents classified horses as livestock animals and 18% classified horses as neither pet nor livestock animals. Over 80% of respondents classified beef cows, dairy cows, pigs, chickens, and turkeys as livestock animals. Sheep (78%), goats (72%), ducks (51%), and geese (55%) were predominantly classified as livestock animals although there was less consensus on these species than on others. For example, over 30% of respondents classified ducks and geese as neither pet nor livestock.

Understanding respondents' characterizations of the respective animal species may shed light on the level of concern shown for their welfare. For instance, Davis and Cheeke (1998) polled university researchers, graduate and undergraduate students, and others about their views on whether animals have minds and an ability to think and about the relative intelligence of different species. The majority agreed that animals have minds and the ability to think; of these, a large percentage believed that management practices should be changed to better suit

the needs and intelligence levels of the species in question (Davis and Cheeke, 1998). Davis and Cheeke (1998) also explored the idea of different species of animals having differing levels of intelligence; the order of perceived intelligence from the greatest to the least intelligence of the animals surveyed was dog, cat, pig, horse, cow, sheep, chicken, and turkey. In this grouping, with the exception of pigs, the animals with which most Americans interact were perceived to be most intelligent. Additionally, those categorized as the "most intelligent" animals tended to be those typically classified in developed western nations as companion animals (Davis and Cheeke, 1998). Therefore, it is conceivable that how people classify an animal, as a pet, livestock animal, or neither, could potentially impact their perceptions of the animal's intelligence and their feelings towards the animal, specifically with regard to their treatment, use, and human obligations to animals.

Cross-tabulations revealed statistical differences between how dogs and cats were classified by dog and/or cat owners versus non-dog or -cat owners as a pet, livestock, or neither (Table 2). Dog and/or cat owners more often classified both cats and dogs as pets compared with non-cat or -dog owners. However, it is still worth noting



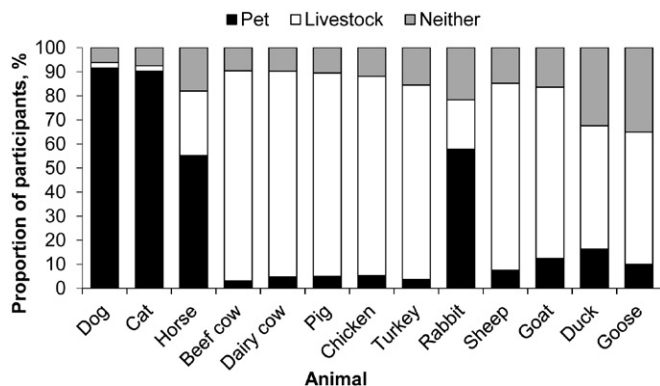


Figure 1. Classification of animals as pets, livestock, or neither as perceived and self-reported by survey respondents. See online version for figure in color.

that 7% of cat and/or dog owners did not classify dogs as pets and 8% did not classify cats as pets. These participants may view these dogs and cats as family members or conversely as working animals, such as livestock herders or pest controllers (e.g., cats that help control mice and rat populations). Non-cat or -dog owners more frequently classified dogs and cats as neither a pet nor livestock animal. It is hypothesized that those indicating that animals were neither pet nor livestock may have perceived them to be wildlife, or it is possible that they simply did not categorize animals at the species level. For example, it is possible that an individual might classify their own dog as a pet but might not classify all dogs as such.

Taylor and Signal (2009) discuss classifying animals as pet, pest, or profit animals, arguing that an animal can have intrinsic value, an inherent morally absolute value, or extrinsic value that they derive from their worth to humans (Taylor and Signal, 2009). Potentially, pets and livestock animals have different values in the minds of consumers. Therefore, classification of animals as pets, livestock, or neither could provide insight into the value an animal holds in the mind of a consumer.

**Opposition to Eating Animals and Animal Products**

Respondents were asked if they were opposed to eating 16 different animals or animal products. However, one’s views on whether it is acceptable to eat certain animals may differ depending on whether the question pertains to their own or others’ choices. For example, does an individual extend their personal ethical or spiritual obligations towards animals to other members of society? Much of the debate in popular press surrounds the idea of altering regulations or norms to change consumption patterns for a society overall. Therefore, in addition to answering for themselves, respondents were asked about their opposition to other people eating those same animals and animal products.

Table 2. Dog and/or cat owners’ versus non cat and dog owners’ classifications of cats and dogs as pet, livestock or neither

	Dog and/or cat owners, n = 518	Not dog or cat owners, n = 280	Statistically significant difference
Do you consider the following animal a pet, livestock, or neither?			
Dog			
Pet	93%	89%	*
Livestock	3%	2%	
Neither	4%	9%	**
Cat			
Pet	91%	88%	*
Livestock	3%	1%	
Neither	6%	11%	**

\*Significant at the 10% level; \*\*Significant at the 5% level.

As shown in Fig. 2, participants could indicate if they were opposed to eating an animal or animal product due to ethical or spiritual reasons or nonethical and/or non-spiritual reasons or not opposed to eating the animal or animal product. The majority of survey respondents were opposed to eating cats and dogs followed closely by horses, with more participants opposed due to ethical and/or spiritual reasons than nonethical or nonspiritual reasons.

For beef cow, dairy cow, pig, chicken, turkey, rabbit, sheep, goat, duck, geese, shellfish, finned fish, and milk and dairy products, the majority of participants were not opposed to eating the animal or animal product. Of those that were opposed, except for turkey and milk or dairy products, more respondents were opposed due to nonethical or nonspiritual reasons. Aside from cats, dogs, and horses, most participants were opposed to eating rabbits and goats, potentially due to these animals being kept as pets by many people in the United States. Ninety more people were opposed to eating a dairy cow than the dairy cow’s milk or dairy products; furthermore, 70 more people were opposed to eating a dairy cow than a beef cow. It is hypothesized that more respondents may perceive dairy cows as animals that provide food

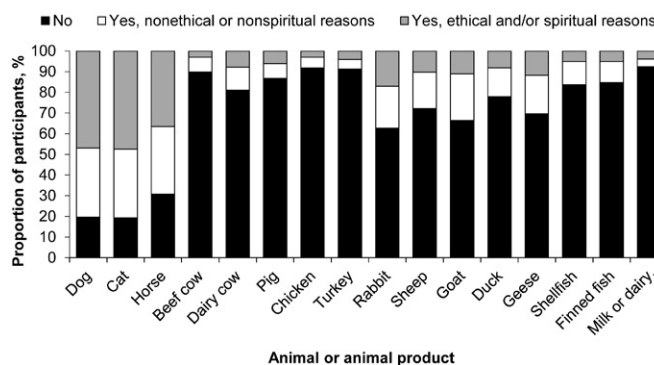
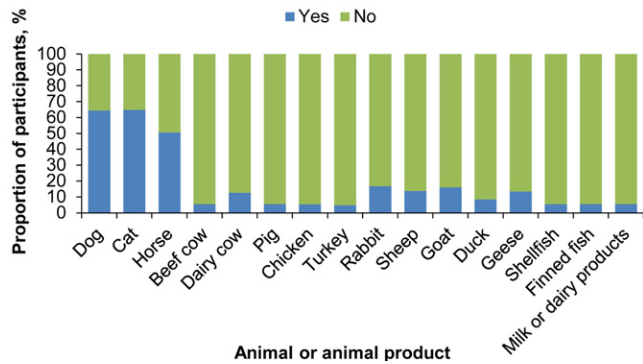


Figure 2. Survey respondents’ self-reported opposition to eating animal species and animal products for nonethical and/or nonspiritual or ethical and/or spiritual reasons. See online version for figure in color.



**Figure 3.** Survey respondents' self-reported opposition to other people eating animal species and animal products. See online version for figure in color.

products without being slaughtered and that the public may not necessarily link dairy cows to meat products. While the foods produced by dairy cows may be varied, beef cattle, by definition, are expected to be harvested for meat. Thus, this difference in opposition to eating may partially stem from these animals' perceived roles in production of animal products.

Given the culture surrounding dogs and cats in the United States and consequent beliefs about the intelligence and emotional natures of these species, it is probably not surprising that most people were opposed to eating cats, dogs, and horses. If this study was repeated in other countries, it is hypothesized that different results would be found depending on the respective norms therein. Potentially, obligations to animals and the ideas of different social contracts with different animals vary by country, region, culture, and spiritual or ethical beliefs held. For example, beef and pork are 2 meats that are commonly consumed in some regions of the world but are not consumed in others for various reasons. Furthermore, consumption of certain animals is often tied to cultural norms or views of the roles of those animals in celebrations or holidays. For example, in the United States the Easter Bunny, Rudolph the Red Nosed Reindeer, Babe, and Bambi are culturally and emotionally significant animal icons that may lead some people to be apprehensive about eating animals of these species or others they perceive to play a significant role in society other than as food animals. This could partly explain the finding that 57% of respondents in our study classified rabbits as pets and 37% were opposed to eating them.

Figure 3 details responses to "I am opposed to other people eating" select animals. For all animals and animal products in question, fewer people were opposed to other people eating the animals or animal products in question than they were to eating them themselves. Wenz (1988) proposes that people have multiple moral circles in a concentric pattern. Most people hold their family and friends in the closest circle and strangers in a circle further away. Extending this to animals, some may

position pets and other domesticated animals (livestock) in inner circles, while wildlife, akin to strangers, may be placed further away. Depending on their view towards and potentially perceived value of animals, some people may place pets in the same circle as their family and friends, while others place them in more distant circles. However, Te Velde et al. (2002) believe that moral circles cannot adequately describe the complex and fragmented values and norms that differ across society. Nevertheless, the idea of moral circles (Wenz, 1988), coupled with the idea of extrinsic and intrinsic value (Taylor and Signal, 2009) and cultural norms could potentially help to explain differences between the animals that people were opposed and not opposed to eating. Essentially, our results suggest that people place common household pets (i.e., cats and dogs) in closer moral circles than other domesticated and wild animals.

Cross-tabulations are shown in Table 3 to better understand how dog and/or cat owners answered questions regarding their opposition to eating and opposition to others eating cats, dogs, and horses. Dog and/or cat owners more frequently reported being opposed to eating dogs, cats, and horses for ethical and/or spiritual reasons while non-cat or -dog owners were more frequently opposed to eating cats and dogs but not horses, due to nonethical/nonspiritual reasons. Although owning a cat and/or dog was not associated with greater opposition to eating these animals, the reasoning behind opposition was different; ethical and/or spiritual reasons were given for cat and/or dog owners, but nonethical/nonspiritual reasons were provided for non-cat or -dog owners.

When comparing opposition to other people eating cats, dogs, and horses, statistical differences were found between owners of cats and/or dogs and non-cat or -dog owners. Overall, cat and/or dog owners more often reported, by nearly 10%, being opposed to other people eating dogs, cats, and horses. It is hypothesized that dog and/or cat owners may have more established human-animal bonds with these species than others who do not own them and therefore could have perceived different obligations to these animals. It is also plausible that since more dog and/or cat owners were opposed to eating these animals themselves for ethical and/or spiritual reasons, that they felt that these obligations should be held by others also. The long domestication history and close connections many people feel for these particular species, as a function of their cultural and national identities, especially in developed western nations, may further explain some of these responses.

**Table 3.** Dog, cat, and horse cross-tabulations for dog and/or cat owners

	Dog and/or cat owners, n = 518	Not dog or cat owners, n = 280	Statistically significant difference
I'm opposed to eating the following:			
Dog			
Yes – Opposed due to ethical and/or spiritual reasons	50%	41%	**
Yes – Opposed due to nonethical/nonspiritual reasons	30%	40%	**
No	20%	19%	
Cat			
Yes – Opposed due to ethical and/or spiritual reasons	52%	39%	**
Yes – Opposed due to nonethical/nonspiritual reasons	29%	42%	**
No	19%	19%	
Horse			
Yes – Opposed due to ethical and/or spiritual reasons	40%	30%	**
Yes – Opposed due to nonethical/nonspiritual reasons	31%	36%	
No	29%	34%	
I'm opposed to other people eating the following:			
Dog			
Yes	68%	58%	**
No	32%	42%	**
Cat			
Yes	68%	59%	**
No	32%	41%	**
Horse			
Yes	55%	43%	**
No	45%	57%	**

\*Significant at the 10% level; \*\*Significant at the 5% level.

### Effects and Interrelationships of Individual Characteristics and Responses

In addition to the demographic differences shown in Table 1, dog and/or cat owners were found to be statistically different from those who did not own a cat or dog across other factors (Table 4). Data analyzed in McKendree (2013) was used for cross-tabulation analysis. McKendree (2013) used last farm visit as a proxy of familiarity with agriculture finding that 14% of respondents had visited a farm with animals being raised for milk, meat, or egg consumption in the last year, 16% visited 1 to 5 yr ago, 7% 6 to 10 yr ago, 31% over 10 yr ago, and 31% had never visited such a farm. Additionally, McKendree (2013) asked multiple questions regarding general concern for animal welfare and views on specific pork industry practices as well as concern for pork industry segments. On a scale from 1 (not concerned) to 7 (most concerned), respondents were asked to rank their concern for the welfare of animals used in domestic (U.S.) food production and those produced outside the

**Table 4.** Cross-tabulations for dog and/or cat owners by those who do not own a dog or cat

	Dog and/or cat owners, n = 518	Not dog or cat owners, n = 280	Statistically significant difference
	A	B	
Last farm visit			
I have never visited such a farm	27%	37%	**
Over 10 yr ago	29%	36%	**
6–10 yr ago	8%	5%	*
1–5 yr ago	18%	14%	
Within the last year	18%	8%	**
Please indicate your level of concern regarding the welfare of livestock animals employed in food production, where 1 indicates not concerned and 7 extremely concerned			
Domestically produced	4.46	3.88	**
Produced outside of the United States	5.46	5.16	**
Animal welfare information source			
Information source not Humane Society of the United States (HSUS) or People for the Ethical Treatment of Animals (PETA)	28%	20%	**
HSUS or PETA	23%	12%	**
No animal welfare source	49%	68%	**
Over the past 3 yr have you reduced your overall pork consumption because of animal welfare/handling concerns?			
Yes	14%	13%	
No	86%	87%	
How much do you agree that the following practices seriously reduce the welfare of pigs, where 1 indicated very strongly agree and 7 very strongly disagree?			
Castration (neutering) of male pigs	4.09	3.90	
Confining hogs indoors	3.64	3.72	
Use of farrowing crates <sup>1</sup>	3.71	3.71	
Use of gestation crates <sup>2</sup>	3.55	3.69	
Housing sows in group pens <sup>3</sup>	3.63	3.83	
Ear notching for identification	4.21	4.33	
Tail docking	4.02	4.16	
Teeth clipping	3.79	3.97	
Have you seen media stories regarding the welfare of pigs on/in:			
Television	20%	21%	
Internet	24%	15%	**
Printed newspaper	8%	6%	
Magazines	9%	6%	
Books	5%	5%	
I have not seen any media stories regarding pig welfare.	63%	69%	*

<sup>1</sup>A crate or cage in which a sow is individually confined at time of farrowing (giving birth to piglets).

<sup>2</sup>A crate or cage in which a sow is individually confined during the animal's 4-mo pregnancy until the time of farrowing (giving birth to piglets).

<sup>3</sup>A pen in which a group of sows is placed during the animal's 4-mo pregnancy until the time of farrowing (giving birth to piglets).

\*Significant at the 10% level; \*\*Significant at the 5% level.



United States. The mean level of concern for the welfare of livestock animals outside the United States was 5.4 while the mean level of concern for animals domestically was 4.3 (McKendree, 2013). In this analysis, dog and/or cat owners had also visited a farm with animals raised for meat or milk production more recently and were more concerned about food animal welfare for both domestically raised food animals and food animals raised outside the United States. Furthermore, McKendree (2013) analyzed primary animal welfare information sources and found that most of respondents indicated that they did not have a source for animal welfare information. Of those who reported a source, an equal percentage of participants reportedly used HSUS and PETA as those who used federal or state governmental agencies, university scientists/researchers, and the agricultural industry groups provided (McKendree, 2013). In this analysis, dog and/or cat owners more often reported having a source for animal welfare information than those who did not own these species. It is hypothesized that owning a pet may predispose one to be more concerned about animal welfare and to seek or attend to information on the topic. Thus, having a bond with companion animal species potentially influences a person's perceptions regarding food animal welfare.

It is apparent that there were differences between households that had dogs and cats and those that did not in terms of concern for animal welfare, animal welfare sources, and various demographic factors. It was found that of the 518 (65%) households that owned dogs and/or cats, 416 (80%) did not cage their dogs and/or cats. The majority of those who reported that they did cage their dog and/or cat did so for less than 6 h/d. Specifically, 56 (11%) households confined their dogs and/or cats for less than 6 h/d, 27 (5%) households caged animals for 7 to 12 h/d, 13 (3%) households did so for 13 to 18 h/d, and 6 (1%) households caged animals for 19 to 24 h/d. Additionally, it was found that those dog and/or cat owners who reported caging their animals were younger, more frequently had a college education, had greater incomes, and more frequently stated they had visited a farm recently (Table 5).

McKendree (2013) found that 14% of respondents indicated they had reduced their pork consumption, with an average reduction of 56% from their previous consumption, in the past 3 yr due to animal welfare and handling concerns. Additionally, participants were asked if they recalled seeing media stories regarding pig welfare on/in the television, internet, printed newspaper, magazines, and books or if they have not seen any media stories regarding pig welfare (McKendree, 2013). Multiple media story outlets could be selected unless "I have not seen any media stories regarding pig welfare" was chosen. Sixty-five percent of respondents stated that they had not seen any media stories regarding pig

welfare (McKendree, 2013). Those who caged their dog and/or cat more frequently stated that they had reduced their pork consumption due to animal welfare concerns and recalled media stories regarding pig welfare. When looking at information sources, those who caged their dog and/or cat more commonly stated that they had an information source and additionally they more frequently used a source that was not HSUS or PETA. More dog and/or cat owners who caged their animals also reported being concerned about domestic food animal welfare.

Multiple reasons may exist to explain why dog and/or cat owners who caged their own animals may have been more concerned about food animal welfare. It is possible that dog and/or cat owners view caging their own animals for specified periods during the day as a necessary safety precaution while they see continuous confinement of animals as being unnecessary and, therefore, a welfare concern. In addition to the differences in the length of time that the respective animals are caged, the size of the cage (relative to the size of the animal) and the total restriction of movement might all influence dog and/or cat owners in their perceptions of the welfare effects of caging pigs compared with their own animals. It is also possible that those dog and/or cat owners who caged their animals were more hands-on and concerned about animal care and protection in general, thus making them more concerned for food animal welfare as well.

Those who caged their cat and/or dog did not differ in their mean level of concern for pig housing situations (i.e., confining hogs indoors, farrowing crates, gestation crates, and group pens) from those who did not cage. On the contrary, as evidenced by higher reporting of reduction in pork consumption due to animal welfare concerns and more concern for domestic food animal welfare, those who caged their animals seemed to be overall more concerned about food animal treatment. While some proponents of gestation stalls for sows have suggested recently that continuous confinement of sows should not be problematic for members of the lay public who also confine their companion animals, our results suggest that this argument is not likely to be effective, especially given the small percentage of owners who reported caging their animals, particularly for extended periods of time, and the overall higher level of welfare concerns these respondents exhibited.

## SUMMARY AND CONCLUSIONS

As questions about the ethics of modern animal agriculture continue to be raised, the factors underlying concerns and their implications for animal care and use decisions and policies must be better understood. To that end, an online survey was conducted in the summer of 2012 to better understand consumer classification of dif-

**Table 5.** Cross-tabulations for dog and/or cat owners who report caging their dog and/or cat and those who reported not caging their dog or cat

	Does not cage cat and/or dog <i>n</i> = 416 A	Does cage cat and/or dog <i>n</i> = 102 B	Statistically significant difference
I am ____ years old	46.79	35.95	**
Not a college grad	55%	37%	**
College graduate	45%	63%	**
Household income			
Lower income (less than \$60,000)	69%	56%	**
Middle income (\$60,001 to \$199,999)	25%	37%	**
High income (greater than \$120,000)	6%	7%	
Last farm visit			
I have never visited such a farm	29%	20%	*
Over 10 yr ago	31%	20%	**
6–10 yr ago	7%	14%	**
1–5 yr ago	15%	26%	**
Within the last year	18%	20%	
Over the past 3 yr have you reduced your overall pork consumption because of animal welfare/handling concerns?			
Yes	11%	29%	**
No	89%	71%	**
How much do you agree that the following practices seriously reduce the welfare of pigs, where 1 indicated very strongly agree and 7 very strongly disagree?			
Castration (neutering) of male pigs	4.14	3.87	
Confining hogs indoors	3.58	3.90	
Use of farrowing crates <sup>1</sup>	3.65	3.94	
Use of gestation crates <sup>2</sup>	3.52	3.70	
Housing sows in group pens <sup>3</sup>	3.62	3.64	
Ear notching for identification	4.26	4.01	
Tail docking	4.00	4.12	
Teeth clipping	3.69	4.19	**
Have you seen media stories regarding the welfare of pigs on/in:			
Television	17%	34%	**
Internet	21%	36%	**
Printed newspaper	6%	18%	**
Magazines	6%	21%	**
Books	3%	14%	**
I have not seen any media stories regarding pig welfare.	69%	38%	**
Animal welfare information source			
Information source not Humane Society of the United States (HSUS) or People for the Ethical Treatment of Animals (PETA)	24%	46%	**
HSUS or PETA	22%	26%	
No animal welfare source	54%	28%	**
Concern for animal welfare of domestic food animals			
Not concerned <sup>4</sup>	31%	21%	*
Neutral <sup>5</sup>	20%	16%	
Concerned <sup>6</sup>	49%	63%	**

<sup>1</sup>A crate or cage in which a sow is individually confined at time of farrowing (giving birth to piglets).

<sup>2</sup>A crate or cage in which a sow is individually confined during the animal's 4-mo pregnancy until the time of farrowing (giving birth to piglets).

<sup>3</sup>A pen in which a group of sows is placed during the animal's 4-mo pregnancy until the time of farrowing (giving birth to piglets).

<sup>4</sup>Not concerned was indicated by 1 to 3 on a 7-point Likert scale

<sup>5</sup>Neutral was indicated by 4 on a 7-point Likert scale

<sup>6</sup>Concerned was indicated by 5 to 7 on a 7-point Likert scale

\*Significant at the 10% level; \*\*Significant at the 5% level.

ferent animal species and opposition to eating different animals and animal products.

A key factor that was associated with general animal welfare concern was dog and/or cat ownership. It is hypothesized that human-animal bonds and having a source for animal welfare information play significant roles in an individual's concern for animal welfare. One implication of this finding could be that those who own pets feel greater moral obligations to animals in general and are therefore more likely to be concerned about animal well-being. The increased interest in protecting food animals may stem from interactions with and emotional connections to pets, especially when combined with other factors such as the source for animal welfare information, education level, age, and gender. Although a causal relationship cannot be established, pet ownership and increased concern for food animal welfare seem to be correlated. However, it is not necessarily that activists targeting information toward pet owners cause people to become more concerned about animal well-being, but rather it may be that those who are already interested in and concerned about animals tend to connect with groups that share their concerns. Latent moral beliefs about perceived obligations to livestock animals seem to be correlated with pet ownership and human animal bonds. This finding has implications for education and outreach relative to food animal welfare in that those attempting to disseminate sound information about animal welfare are likely to find companion animal owners to be more receptive and attentive audiences than those who do not own pets.

In summary, it is plausible that consumers perceive different contract "terms" to exist depending on the animal species or even the specific animal (i.e., individual dog or cat) in question. As a result, they may hold different perceived obligations to specific animal species when purchasing meat and milk products. Due to the complexity of the food supply chain, it is conceivable that no single contract can exist between a consumer and a specific animal but that a series of intertwined contracts is more likely. As intensive, industrialized food animal production continue to present socioethical challenges in the United States and abroad, it is increasingly important to explore the latent beliefs and values that contribute toward and ultimately may determine which animal care and use practices are deemed socially acceptable.

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