Abstract

Three studies investigated whether thoughts and feelings generated by baby animals might oppose appetite for meat. A prestudy established babyness as an important factor predicting moral concern for farmed animals. Study 1 showed that presenting images of baby animals, versus adult animals, as the source of meat reduced appetite for meat, but this effect was weak and found exclusively among women. Study 2 replicated and extended Study 1 using a larger sample and two new animal sources. Study 3 included a no animal comparison condition, and found greatest levels of reduced appetite for meat when the meat source was presented as a baby animal, as opposed to an adult animal or no visual indication of the animal source. A meta-analysis of the results using Bayes factors revealed considerable cumulative evidence in favor of the hypothesis that images of baby animals temporarily reduce women's appetite for meat. In contrast, the evidence for men was less strong. Our results highlight a tension within some omnivores between caring for baby animals and appetite for meat.

Keywords: baby animals; meat; appetite; cuteness; tenderness; moral concern

Introduction

As of September 28, 2016, the BuzzFeed video "Bacon Lovers Meet Baby Pigs" (https://www.youtube.com/watch?v=ZyrvMuNPJ-Y) had 9,489,563 views on YouTube. The video depicts five twenty-year-olds sitting at a dinner table excitedly awaiting an empty plate to be filled with mouth-watering bacon. However, as the video unfolds you watch their expressions morph from anticipation to astonishment, their voices rise to high-pitched squeals of affection, as they are handed a cute baby pig. While cuddling the piglet in her arms, one female respondent announces, "I'm never going to have bacon ever again," while another male respondent quips, "I mean, he does look delicious, let's be honest." While meant to entertain, the video raises an interesting question about our relationship with animals slaughtered for food.

Many animal advocacy groups seem to operate under the assumption that there is an opposition between our feelings of tenderness towards vulnerable animals and our appetite for meat. Many groups, including *Viva!*, The Humane League, PETA, Animal Equality, and The Humane Society, use images of baby animals on their websites and in their promotional material, chosen strategically to melt the heart of the most committed meat eater. Explicit appeals to sympathy for baby animals is a common persuasion tactic used to encourage people to reduce their meat consumption. For example, a promotional booklet for the international NGO, *Beyond Carnism* includes a photo of baby chicks in distress with the caption: "Because male chicks in the egg industry are considered useless, they are ground up alive, gassed, electrocuted, or suffocated shortly after birth."

The efficacy of images of baby animals as a meat-reduction tactic seems intuitive, yet empirical evidence for this strategy is lacking. Are there actual benefits to using images of baby animals within such campaigns? Might thoughts of baby

farmed animals temporarily disarm appetites for meat, and are there gender differences in this respect?

Baby Schemas and their Motivational Consequences

Many studies have shown that men and women tend to converge in their judgments of which *human* babies are cute (Alley, 1981; Glocker, Langleben, Ruparel et al., 2009a; Hildebrandt & Fitzgerald, 1979). Judgments of cuteness appear to involve the identification of what ethologist Konrad Lorenz called *Kindchenschema*, or baby schema, a set of infantile features that includes a large head, round face, high protruding forehead, large eyes, chubby cheeks, small nose and mouth (Lorenz, 1943/1977). Men and women both find highly schematic baby faces visually appealing and report greater motivations to care for infants with high *Kindchenschema* faces (Alley, 1983; Glocker et al., 2009a; Hildebrandt & Fitzgerald, 1979; Langlois, Ritter, Casey, & Sawin, 1995). Nonetheless, a few studies have found that women, particularly young women, are better than men at discriminating neotenous features (Lobmaier, Sprengelmeyer, Wiffen, & Perrett, 2010; Sprengelmeyer, Perrett, Fagan et al., 2009). Women with high maternal tendencies find cute infant faces especially rewarding (Hahn, DeBruine, & Jones, 2015), which suggests that motivational factors related to caregiving may contribute to this difference.

The emotional and motivating effects of baby features are not limited to human infants. Several studies have found that adults and children alike prefer animal targets with neotenous characteristics, perhaps because they associate these characteristics with being vulnerable and dependent on others for protection. Just as infants with enhanced neotenous features are preferred and found more attractive than infants lacking these features, similar preferences and ratings have been observed

with non-human targets (e.g., cats and dogs; Archer & Monton, 2011; Borgi & Cirulli, 2013; Borgi, Cogliati-Dezza, Brelsford, Meintis, & Cirulli, 2014; Sanefuji, Ohgami, & Hashiya, 2007). Other studies have found that viewing baby animals can promote caretaking behaviors, particularly among women. For example, Sherman, Haidt, and Coan (2009) exposed female undergraduates to images of kittens and puppies, or adult cats and dogs, and then had participants perform a task of fine-motor dexterity. Women who were exposed to baby animals received higher scores on the fine-motor task than those exposed to the adult animals, suggesting that they were influenced by the baby schema to behave more carefully. While men also display preferences for neotenous features in animals, baby animals may be particularly emotionally salient for women, mirroring findings with human infants.

Baby Animals, Gender, and Appetite for Meat

If baby schemas evoke feelings of tenderness and motivations to care for the vulnerable target, might these feelings be antithetical towards motivations to consume meat? To the best of our knowledge, only one published paper to date has examined this question. Ruby and Heine (2012) found that the appearance of an animal—how "ugly" vs. "cute" the animal is, on a sliding scale, with "neutral" as the midpoint—predicted levels of disgust toward eating animals. Meat from uglier *and* cuter animals were rated more disgusting. However, because this study was correlational, it remains to be seen if the baby status of an animal has a causal influence on appetite for meat. Recent related research has shown that people's beliefs about the mistreatment of animals raised for meat (e.g., animals raised in poor living conditions) can negatively impact upon people's appetite for meat, including considerations of the look, smell, and taste of meat (Anderson & Barrett, 2016). Yet, as far as we are aware, no

experiments to date have tested whether *positive* perceptions and feelings associated with baby animals might reduce people's appetite for meat.

Research into meat avoidance motives suggests that when people think about animals as living creatures they tend to exhibit more moral concern for the animal than when they conceive of animals as food (Bastian, Loughnan, Haslam, & Radke, 2012; Bilewicz, Imhoff, & Drogosz, 2011; Bratanova, Loughnan, & Bastian, 2011; Loughnan, Bastian, & Haslam, 2010), and directly linking an animal source with meat can reduce motivations for consumption (Kunst & Hohle, 2016; Tian, Hilton, & Becker, 2016). However, there are large gender differences in this respect. Women appear to have more chronically accessible thoughts about the animal origins of meat (Rothgerber, 2012), and tend to report more disgust and ambivalence toward meat than men (e.g., Beardsworth, Bryman, Keil et al., 2002; Kubberød, Ueland, Rødbotten, Westad, & Risvik, 2002; Kubberød, Ueland, Risvik, & Henjesand, 2006; Nordin, Broman, Garvill, & Nyroos, 2004; Ruby, 2012; Schösler, de Boer, Boersema, & Aiking, 2015). When combined with studies that show women on average respond with greater emotion to baby faces than men, we might speculate that women's appetite for meat from baby animals may be more labile and susceptible to influence compared to men's appetite.

The Present Studies and Hypotheses

In three studies, we tested the hypotheses that (a) directly associating baby animals to meat would temporarily reduce appetite for meat, more so than directly linking adult animals, and (b) women would be more likely than men to exhibit such reductions. We theorised that images of baby animals may serve to reduce appetite for meat largely due to appraisals of cuteness and associated feelings of tenderness generated by baby animals, which appear incompatible with thoughts about the

slaughter of animals for meat. In this way, we expect women to report greater feelings of tenderness toward baby animals used for meat, as well as reduced appetite towards meat associated with these baby animals, relative to adult animals. Indeed, in our prestudy (see below), women reported significantly greater feelings of tenderness towards baby farmed animals, including chicks, piglets, calves, and lambs (M=7.22, SD=1.73), than men (M=5.96, SD=2.04), $t(43)=2.22$, $p=.03$, $d=.67$, $B_{[U=0,2]}=7.51$. Because of men's overall higher levels of positivity towards meat, and their relatively lower feelings of tenderness toward baby animals, we did not expect men's appetite for meat to be reduced to much degree in response to baby animals.

Prestudy. While our main studies were aimed at testing the demotivating influence of baby animals on appetite for meat, we first ran a prestudy that established an image set of 40 farmed animals (20 baby, 20 adult; chickens, cows, sheep, and pigs) to use in the subsequent studies. In this prestudy, the images of baby farmed animals were rated significantly higher on appraisals of cuteness and vulnerability, and evoked significantly greater feelings of tenderness and warmth, than the images of adult farmed animals. These four items formed a tightly associated index, which we labelled "babyness," to denote the appraisals and emotions associated with the animal's status as a baby (Cronbach's $\alpha = .98$)—see Supplementary Materials for each image and its corresponding babyness rating. Because these four components formed a single construct, for expediency, we used only one of the four items to confirm the success of our subsequent manipulations (appraisals of cuteness in Studies 1-2, and feelings of tenderness in Study 3). Of note, the prestudy also demonstrated that the appraisal and emotional aspects of perceiving baby animals predicted people's moral attitudes towards animals independent of perceptions of animals' intelligence and harmfulness, two factors previously shown to predict the

moral status of animals (see e.g., Piazza, Landy, & Goodwin, 2014; Sytsma & Machery, 2012).

Bayes factors and Open Science. In line with guidelines offered by Dienes and McLatchie (2017), we report Bayes factors (*B*) alongside *p*-values for all one degree of freedom effects. Our analyses are interpreted principally with regards to Bayes factors, which provide a continuous measure of evidence for one hypothesis (e.g., H0) relative to another hypothesis (e.g., H1). Values greater than 1 (towards infinity) indicate support for the alternative hypothesis. Values less than 1 (towards zero) indicate support for the null hypothesis. Here we use Dienes' (2008) calculator that compares a specified alternative hypothesis (H1) to a point null hypothesis (H0) (R script created by Baguely & Kaye, 2010). Throughout the current paper we specify the uniform prior on the assumption that raw effects of greater than 2 on scales of 1-9 are uncommon (i.e., $B_{U[0-2]}$). Indeed, gender differences in evaluations of meat often fall within this range (see, e.g., Hayley, Zinkiewicz, & Hardiman, 2015; Rothgerber, 2012; Tian et al., 2016). Note however that the conclusions we draw based on the uniform distribution are consistent with other ways of modelling H1 (see the Analysis Script in the Supplementary Materials for Bayes factors that model H1 also using half-normal and normal distributions). Conventionally, *B*s < 0.33 have been considered noteworthy evidence for the null hypothesis while *B*s > 3 have been considered noteworthy evidence for the alternative hypothesis; values between 0.33 and 3 have been considered as only weak or inconclusive evidence (Jeffreys, 1939/1961). The R script for all *B*s, SPSS data files and Qualtrics files for all studies are available via the Open Science Framework: https://osf.io/m9v5q/. All conditions and measures are reported.

Study 1 – Babyness, Gender, and Appetite for Meat

In Study 1, we sought an initial test of whether an image of a baby animal, when paired with an image of meat, might effectively reduce appetite toward the meat, relative to when the meat is paired with an image of the adult version of the same animal. We also examined, in an exploratory manner, whether this might be the case independent of whether the animal is from a familiar animal (cow) or exotic source (kangaroo). Since unfamiliar meat is often met with reduced sensory appeal (e.g., Tucker, 2014), we expected meat from exotic animal sources to be rated less appetizing than the same meat from a familiar source, but we refrained from speculating about whether familiarity would interact with baby status or gender in any manner. We hypothesized that gender would moderate the influence of baby animals on appetite for meat, such that women would find meat from baby animals less appetizing than meat from adult animals, while there would be little or no impact of babyness on men's appetite. We also expected women to find meat from baby animals much less appetizing than men did, while we expected women and men to converge more closely in their appetite for meat produced from adult animals.

Method

Participants. We recruited 172 participants via Amazon's Mechanical Turk online labor market (www.mturk.com; for information about Mechanical Turk, see Paolacci, Chandler, & Ipeirotis, 2010). All participants were located in the United States and were paid $.50 for their participation. Four participants reported eating no meat at all or only fish, and thus were excluded from the analysis. The final sample was comprised of 168 omnivores (i.e., individuals who "eat meat and other animal products", or who "eat meat, but only on rare occasions or only certain types of meat"). There were 100 males, 68 females (M_{age}=31.92 years, SD=9.54).

Design. We used a 2 (adult vs. baby animal source) x 2 (familiar vs. exotic animal source) x 2 (male vs. female participants) between-subjects factorial design, with random assignment.

Procedure and materials. Participants were invited to take part in a study on "food preferences," and were randomly assigned to one of the four conditions. They were presented an image of a cooked meat dish (same for all participants) paired with an image of one of the four animals (calf, bull, baby kangaroo ["joey"], or adult kangaroo; see Supplementary Materials for images). The animal was presented above the meat dish on the page and participants were told the meat "comes from the animal depicted above." The task was to rate how "appetizing" they found the meat on a sliding scale from 0 (*Not at all appetizing*) to 100 (*Extremely appetizing*). Afterwards, on a separate page, participants were presented the image of the animal a second time and rated how "cute" the animal is on a 0 (*Not at all cute*) to 100 (*Extremely cute*) scale.

Lastly, participants answered a dietary questionnaire used to assess their stance towards meat (omnivore, semi-vegetarian, pescatarian, lacto- or ovo-vegetarian, strict vegetarian, dietary/lifestyle vegan) and the frequency with which they ate various meat products on a scale from 1 (*Never*) to 7 (*Every day*). Definitions were provided for each dietary classification. The meat items included pork, bacon, ham, beef, steak, veal, kangaroo meat, lamb, chicken, turkey, fish, and seafood. Afterwards, participants answered some basic demographic questions, were debriefed and paid.

Results

Cuteness. Baby animals were rated cuter (M = 85.36, SD = 19.47) than adult animals (M = 48.71, SD = 28.60), $F(1,160) = 100.27$, $p < .001$, $\eta^2_p = .385$, $B_{U[0\text{-}20]} >$

100, confirming the success of our manipulation of babyness. The exotic animal was also overall rated cuter ($M_{kangaroo}$ = 74.73, *SD* = 26.05) compared to the familiar animal (M_{cow} = 60.31, *SD* = 32.95), $F(1,160) = 15.59$, $p < .001$, $\eta^2_p = .089$, $B_{U[0\text{-}20)]} > 100$. There was also an interaction of babyness and familiarity on cuteness ratings, $F(1,160) = 6.29$, $p = .013$, $\eta^2_p = .038$. This interaction may be explained by a smaller (although significant) difference in the perceived cuteness of the joey (M_{joey} = 87.96, *SD* = 3.34) and calf (M_{calf} = 82.87, *SD* = 3.53), $t(85) = 6.91$, $p < .001$, $B_{U[0\text{-}20)]} > 100$, compared to the difference between the adult kangaroo ($M_{kangaroo}$ = 61.45, *SD* = 3.41) and bull (M_{bull} = 38.66, *SD* = 3.83), $t(79) = 28.35$, $p < .001$, $B_{U[0\text{-}20)]} > 100$. Finally, women rated the animals cuter overall (*M* = 74.58, *SD* = 27.63) compared to men (*M* = 63.01, *SD* = 31.44), $F(1,160) = 7.23$, $p = .008$, $\eta^2_p = .043$, $B_{U[0\text{-}20)]} = 19.47$. There were no other two-way interactions, *p*s > .170, and the three-way interaction was marginally significant, $p = .086$.

Appetite. We conducted a 2 (male, female) x 2 (baby, adult) x 2 (familiar, exotic) ANOVA on appetite ratings. Unsurprisingly, there was strong evidence for an effect of familiarity, $F(1,160)=45.66$, $p<.001$, $\eta^2_p=.22$, $B_{U[0\text{-}20)]}=1.85\text{x}10^7$. Meat from an exotic animal was rated less appetizing (*M*=39.55, *SD*=35.16) than when it was from a familiar animal (*M*=72.75, *SD*=27.47). The main effect of babyness was inconclusive, $F(1,160)=2.81$, $p=.10$, $\eta^2_p=.02$, $B_{U[0\text{-}20)]}=1.44$, with baby animals being rated somewhat less appetizing overall (*M*=53.36, *SD*=37.48) compared to adult animals (*M*=58.33, *SD*=33.66). There was considerable evidence for the effect of gender, $F(1,160)=10.59$, $p=.001$, $\eta^2_p=.06$, $B_{U[0\text{-}20)]}=66.53$. Overall, women rated the meat less appetizing (*M*=42.84, *SD*=36.99) than men (*M*=64.55, *SD*=34.49). Critically, the Bayes factor suggested there was substantial evidence for the interaction between baby and gender, $F(1,160)=3.62$, $p=.06$, $\eta^2_p=.02$, $B_{U[0\text{-}20)]}=4.30$

(see Figure 1 for appetite means and standard errors as a function of gender and babyness). All other interactions were inconclusive, *p*s>.10, *B*s<2.78.

[Insert Fig. 1 about here]

We conducted simple-effects tests to further decompose the interaction effect. As can be seen in Figure 1, there was strong evidence that men and women differed in their appetite for the meat when the meat was paired with a baby animal, $t(85)=3.73$, $p<.001$, $B_{U[0-20]}=97.70$, with women desiring the meat less than men. Interestingly, when the meat was paired with an adult animal, the evidence suggested that the difference between men and women was still substantial, $t(79)=1.93$, $p=.06$, $B_{U[0-20)]}=4.50$, although the evidence for gender differences in appetite following adult images was considerably weaker than the evidence for gender differences in appetite following baby images ($B= B_{baby}/B_{adult} =21.71$). The influence of babyness on appetite when focusing only on women provided weak or inconclusive evidence in favor of the experimental hypothesis, $t(66)=1.51$, $p=.14$, $B_{U[0-20)]}=2.46$; for men, the evidence offered weak or inconclusive evidence in favour of the null hypothesis, $t(98)=-.10$, $p=.92$, $B_{U[0-20)]}=0.40$.

Finally, there was noteworthy support for the negative correlation between animal cuteness ratings and appetite for the meat dish, $r(167)=-.14$, $p=.07$, $B_{U[0-.20)]}=3.76$. However, because the total effect of babyness on appetite was inconclusive, we were not justified to test whether cuteness appraisals played any mediating role between babyness and appetite in this study.

Discussion

In Study 1, as predicted, reductions in appetite due to babyness interacted with participant gender, with Bayes factors revealing substantial evidence for an interaction effect. We found that men and women differed in their appetite toward

meat when the meat was paired with a baby animal image, with women's appetite for meat much lower than men's appetite, regardless of whether the meat was from a familiar or exotic source. Although Bayes factors suggested that the data for women do support a decline in appetite when meat is paired with a baby animal, the evidence was weak and not conclusive. The evidence also provided inconclusive support for the hypothesis that men were uninfluenced by the animal source.

There were several limitations with Study 1 that restrict the conclusions we can draw from its results. First, the size of the sample, which was determined by resources available to the authors at the time, was not ideal. Several of the analyses offered only weak, inconclusive evidence for our experimental hypotheses. As sample size increases towards infinity, Bayes factors will provide stronger evidence for the hypothesis that best predicts the data. Increasing the sample size also has the beneficial outcome of improving statistical power for making frequentist inferences. Although we interpret our results in terms of Bayes factors throughout, it is nonetheless the case that to make accurate frequentist inferences, studies must be sufficiently powered to reliably detect small effects (e.g., f =.20). For the current study, setting α to .05, we would want at least N=277 to maintain power at .80 (N=359 at .90) to identify small between-participants effects and two-way interactions, as calculated in G*Power 3.1 (Faul, Erdfelder, Lang & Buchner, 2007). Therefore, in Study 2 we sought to more than double our N.

Secondly, Study 1 used a single, familiar animal source (cattle). In Study 2, we sought to determine if babyness exerts an influence on appetite for meat using two other animals: sheep and pigs, to test the generalizability of our findings. We also included a new meat dish, both for generalizability and for pragmatic reasons (i.e., we needed a meat dish believably derived from both animal sources). Finally, in Study 1,

the animal images used for the adult and baby counterparts had some incidental differences (e.g., the baby kangaroo was being held by a person but the adult kangaroo was not; the bodily orientation of the calf and bull differed) that we sought to minimize in Study 2, to isolate babyness as the principal variable.

Study 2 – Replication and Generalizing to Other Animal Types

Method

Participants. We recruited a sample of 361 participants via MTurk. All participants were located in the United States and were paid $.50 for their participation. Twenty-two participants reported being vegetarian or vegan; however, three of these participants also reported eating various non-fish, non-seafood meat products to some extent, and thus were retained in the sample. In the end, nineteen participants were removed from the sample who reported not eating meat products, including pork, bacon, ham, beef, steak, lamb, chicken, and turkey (M=1.09, SD=0.29, on a scale 1=*Never* to 7=*Every day*). Of the remaining 342 omnivores (meat consumption frequency M=3.49, SD=0.88), 159 were female and the mean age was 34.88 years (SD=10.94).[2]

Design. We used a 2 (babyness: adult vs. baby) x 2 (animal type: sheep vs. pigs) x 2 (male vs. female participants) between-subjects factorial design, with random assignment.

Procedure and materials. The procedures were identical to Study 1, except in three respects. First, we replaced the animal images to an adult sheep and adult pig, and, for the baby condition, a lamb and piglet. These images were derived from our prestudy. The orientation and setting (standing on grass) of the adult and baby counterpart were matched for each animal type. Second, the image of the meat dish was replaced with an image of meat suggestive of meat sourced from sheep and pigs.

The meat, which was the same in all conditions, was actually lamb chops, but resembled pork chops as well – see Supplementary Materials for images. All images were set to a standardized width of 500mm. Finally, in addition to making appetite ratings on the same 0-100 scale as in Study 1, we added a second measure of appetite: how willing participants would be to eat the meat depicted in the photograph (0 = *Not at all willing*, 100 = *Very willing*). These two ratings were highly interrelated (α = .93), and thus were averaged into a single index of appetite. As in Study 1, participants rated how cute they found the target animal on the same 0-100 scale from Study 1. All participants provided their meat consumption frequencies (same items as Study 1 minus "veal" and "kangaroo meat"), dietary classification (same categories as Study 1 plus "meat lover") were fully debriefed and paid.

Results

Cuteness. Confirming the success of our choice of baby and adult images, there was a very large effect of perceived cuteness, as baby animals were rated overall cuter (M=82.37, SD=19.89) than adult animals (M=58.46, SD=26.81), $F(1,334)=92.66$, $p<.001$, $\eta^2_p=.91$, $B_{U[0\text{-}20)]}=2.41\text{x}10^{18}$. Sheep were also rated cuter (M=77.02, SD=21.88) compared to pigs (M=63.42, SD=28.95), $F(1,334)=30.45$, $p<.001$, $\eta^2_p=.08$, $B_{U[0\text{-}20)]}=1.26\text{x}10^{6}$. Overall, women rated the animals slightly cuter (M=72.65, SD=26.74) than did men (M=68.34, SD=26.11), but the results were inconclusive, $F(1,334)=1.91$, $p=.17$, $\eta^2_p=.006$, $B_{U[0\text{-}20)]}=0.93$. All interaction effects were inconclusive, Fs<.80, ps>.36, η^2_ps<.003, 0.67< Bs<0.89

Meat appetite. We conducted a 2 (babyness) x 2 (animal type) x 2 (gender) ANOVA on mean appetite scores. There was a main effect of babyness, $F(1,334)=9.24$, $p=.003$, $\eta^2_p=.03$, $B_{U[0\text{-}20)]}=42.24$. Meat sourced from a baby animal was rated overall less appetising (M=49.28, SD=32.91) than the same meat sourced

from an adult animal (M=59.42, SD=31.83). There was inconclusive evidence for the effect of animal type, $F(1,334)=2.96$, p=.09, η^2_p=.009, $B_{U[0\text{-}20)]}$=2.15, with the meat rated less appetising when a sheep was presented as the source (M=50.93, SD=33.73), compared to a pig as the source (M=57.95, SD=31.35). Overall, women rated the meat dish less appetising (M=44.82, SD=32.88) than did men (M=62.69, SD=31.25), $F(1,334)=26.26$, p<.001, η^2_p=.07, $B_{U[0\text{-}20)]}=1.61\text{x}10^5$. However, this time the evidence for the two-way interactions, Fs<.30, ps>.58, η^2_ps<.001, 0.78<Bs<1.36 and the three-way interaction was also inconclusive, $F(1, 334)=.14$, p=.71, η^2_p<.001, $B_{U[0\text{-}20)]}$=1.06. See Figure 2 for means and standard errors by babyness, animal type and gender. Separating by gender, we obtained strong evidence for a moderate effect of babyness on appetite for meat, for women (M_{baby}=38.57, SD=31.87 vs. M_{adult}=50.98, SD=32.90), $t(157)=2.41$, p=.02, d=.38, $B_{U[0\text{-}20)]}$=10.95. We also observed weaker, inconclusive evidence for an effect of babyness on appetite for meat for men (M_{baby}=58.57, SD=31.09 vs. M_{adult}=66.76, SD=29.11), $t(181)=1.84$, p = .07, d = .27, $B_{U[0\text{-}20)]}$=2.92.

[Insert Fig 2 about here]

Mediation analysis. Animal cuteness ratings were weakly negatively correlated with appetite ratings, $r(341)=-.13$, p=.02, $B_{U[0\text{-}.20)]}$=8.96. Since we observed an effect of babyness on both cuteness and appetite ratings, we conducted a mediation analysis with bootstrapping (5,000 resamples) using Hayes' (2013) PROCESS macro for SPSS (model 4). Babyness was entered as the independent variable (0=adult, 1=baby) predicting appetite scores with appraisals of cuteness as the mediator. The indirect effect of babyness on appetite scores via cuteness ratings was not significant, coefficient = -2.05, SE = 1.77, 95% CI = [-5.69, 1.29] (*a* path $B_{U[0\text{-}20]}=2.10\text{x}10^{17}$; *b* path $B_{U[0\text{-}20]}$=0.20). The evidence for the null hypothesis for the *b* path offers

substantial support for the conclusion of no indirect effect. Furthermore, there was substantial evidence for a direct effect of babyness on appetite when cuteness was entered as a mediator, coefficient = -8.09, SE = 3.92, 95% CI = [-15.81, -0.37], $B_{U[0-20]}$=5.52.

Discussion

In Study 2, we found yet more support for our main hypothesis that meat sourced from baby animals is considered less appetizing than meat from adult animals. Babyness had a reducing influence on appetites across two animal types, sheep and pigs. This time the gender did not quite moderate the influence that babyness had on appetite scores. Nonetheless, while the effect was observed for both groups, the effect was larger for women, and the strength of evidence for men would conventionally be considered weak and inconclusive. Finally, although appraisals of animal cuteness and appetite were negatively correlated, appraisals of cuteness did not mediate the effect that babyness had on appetite in this study.

One limitation with Studies 1-2 is the absence of a comparison condition with no mention or depiction of the animal source. How does presenting meat with a baby animal source compare with presenting no animal image at all? Might baby animal images reduce appetites more strongly in this respect compared to adult animal images? In Study 3, we contrasted the influence of presenting an image of a familiar animal (cow), either baby or adult, with the absence of any visual reminders of the animal source. We also switched from appraisals of cuteness to feelings of tenderness as our check on the manipulation of babyness.

Study 3 – Baby vs. Adult vs. No Animal

Method

Participants. We recruited two waves of participants via MTurk on April 16, 2016 and May 2, 2017. All participants were located in the United States and were paid $.50 for their participation. In the first wave "women who eat at least some meat" were invited to participate, while the second wave invited "men who eat at least some meat". We recruited 134 females in the first wave, and 144 males in the second. In the combined datasets, seven participants reported eating no meat at all or only fish, and thus were excluded from the analysis. The final sample was comprised of 271 omnivores (126 female, 145 male; M_{age}=35.04 years, *SD*=10.40).

Please note that Study 3 was originally conducted exclusively with women, on the basis of the results of Study 1, which revealed no discernible influence of baby animal images on men's appetites (historically, we ran Study 3 prior to Study 2). However, in response to reviewer comments, we later deemed the lack of men in our recruitment strategy premature, and therefore ran a separate replication of Study 3 in 2017 with male omnivores.

Design. We used a 3 (image condition) x 2 (gender) between-subjects design. Participants were randomly assigned to the baby animal (*n*=91), adult animal (*n*=87), or no image (*n*=93) condition.

Procedure and materials. The procedures and materials were identical to Study 1, except we used a different image of a calf from our prestudy than the one used in Study 1 (the same bull image from Study 1 was used as our adult animal), we used a different meat dish from the previous studies, and this time we defined the animal as a "baby cow" or "adult cow" rather than using the generic designation "animal" (see Supplementary Materials for images of the animals and meat dish used). The same 0-100 ratings of appetite were used as in Study 1. This time, as our check on babyness, we had participants rate the level of tenderness, 0-100, they felt

toward the animal (calf or bull; "I feel tenderness towards this animal"), after making their appetite rating. Participants in the no animal condition did not make a tenderness rating, since there was no accompanying animal image presented alongside the meat dish. Self-reported dietary classifications (omnivore to lifestyle vegan), frequency of meat consumption (same items from Study 1 minus "kangaroo meat"), and demographics were collected. All participants were then debriefed.

Results

Tenderness. Our participants had more tender feelings toward the baby animal (M_{calf}=69.55, *SD*=28.08) than the adult animal (M_{bull}=52.77, *SD*=31.55), $F(1,174)=14.64$, $p<.001$, $\eta^2_p=.08$, $B_{U[0\text{-}20)]}=638.83$, confirming the success of the image selection. Also, women felt more tenderness overall towards the animals (*M*=72.24, *SD*=26.78) compared to men (*M*=51.62, *SD*=31.22), $F(1,174)=22.91$, $p<.001$, $\eta^2_p=.12$, $B_{U[0\text{-}20)]}=2.27\text{x}10^4$. The interaction of image condition and gender offered only weak evidence in favour of the null hypothesis, $F<1$, $p=.70$, $\eta^2_p=.001$, $B_{U[0\text{-}20)]}=0.40$.

Appetite for meat. A 3 (image condition) x 2 (gender) ANOVA on appetite scores revealed only weak evidence for the main effect of gender, $F(1,265)=26.45$, $p<.001$, $\eta^2_p=.09$, $B_{[0\text{-}20]}=1.71$, and a significant effect of image condition, $F(2,265)=8.88$, $p<.001$, $\eta^2_p=.06$. As in previous studies, men overall rated the meat dish more appetizing (*M*=77.76, *SD*=26.36) than did women (*M*=59.57, *SD*=32.15). The interaction of image condition and gender was not significant, $F(2, 265)=1.08$, $p=.34$, $\eta^2_p=.008$ (see Figure 3 for means and standard errors as function of gender and image condition). Collapsing across gender, the meat was least appetizing when it was presented along with an image of a baby animal (*M*=59.38, *SD*=35.14) as the source and most appetizing when it was presented without any image of the animal source

(*M*=76.89, *SD*=25.99), with the adult animal source falling in between (*M*=71.56, *SD*=27.17). Bayes factors indicated strong evidence for the contrast of baby vs. adult animal images, *MD*=12.18, *SE*=4.46, *p*=.02, $B_{U[0-20]}$=22.28, and the contrast of baby animal vs. no image, *MD*=17.51, *SE*=4.38, *p* < .001, $B_{U[0-20]}$=1161.47. However, the contrast of adult animal vs. no image was inconclusive, *MD*=5.33, *SE*=4.43, *p*=.45, $B_{U[0-20]}$=1.01.

[Insert Fig. 3 about here]

Follow-up contrasts (Tukey's HSD tests) were conducted for each level of image condition, first for women and then for men. For women, there was a main effect of image condition on appetite scores, *F*(2,123)=6.47, *p*=.002, η^2_p=.10. The contrast between the baby and no animal condition provided substantial evidence in favour of the experimental hypothesis, *MD*=23.42, *SE*=6.65, *p*=.002, $B_{U[0-20)]}$=125.08; the contrast between the baby and adult condition also offered substantial evidence in favor of the experimental hypothesis, *MD*=15.80, *SE*=6.73, *p*=.05, $B_{U[0-20)]}$=9.62; the contrast between the adult and no animal condition was inconclusive, *MD*=7.62, *SE*=6.81, *p*=.505, $B_{U[0-20)]}$=1.33.

For men, the overall effect of animal condition on appetite scores was not significant, *F*(2,142)=2.37, *p*=.10, η^2_p=.03. The comparison of appetite for the baby animal and no-image condition was not significant, but indicated substantial evidence for the alternative hypothesis, *MD*=11.22, *SE*=5.28, *p*=.09, $B_{U[0-20]}$=5.92. The comparison of appetite for baby and adult animal, however, revealed only weak evidence in favour of the alternative hypothesis, *MD*=8.02, *SE*=5.39, *p*=.30, $B_{U[0-20]}$=1.88. Finally, the comparison of appetite for the adult animal vs. no-image meat constituted only weak, inconclusive evidence in favour of the null hypothesis, *MD*=3.19, *SE*=5.28, *p*=.817, $B_{U[0-20]}$=0.58.

Mediation analysis. There was strong evidence for a negative correlation between feelings of tenderness and appetite for the meat, $r(177)=-.42$, $p<.001$, $B_{U[0-.20)]}=1.34x10^9$. To test whether feelings of tenderness mediated the effect of babyness on appetite for the meat, we conducted a mediation analysis as in Study 2. This analysis revealed that there was a significant indirect effect of babyness (adult=0 vs. baby=1) via tenderness on appetite scores, coefficient = -6.81, SE = 2.24, 95% CI = [-11.98, -3.05]. Bayes factors of the indirect pathway provided evidence for mediation as well (*a* path $B_{U[0-20]}=488.93$; *b* path $B_{U[0-20]}=3.49x10^4$). The direct effect of babyness on appetite was not significant, coefficient = -5.37, SE = 4.54, 95% CI = [-14.34, 3.59], suggesting full mediation. The Bayes factor for the direct effect, $B_{U[0-20]}=1.53$, suggests the evidence for full mediation however is inconclusive (i.e., more evidence is needed to determine whether the mediating role of tenderness is partial or full).

Bayesian Meta-Analysis of Main Experimental Hypotheses

A fixed-effects Bayesian meta-analysis was conducted using Dienes' (2008)[3] calculator to test the main experimental hypotheses that across three studies participants would rate meat as less appetizing when the meat came from a baby source relative to an adult source, and that this would be largely the case for women more so than men. For discussion regarding the advantages of such internal meta-analyses within multi-study psychology reports, see Goh, Hall and Rosenthal (2016) and Maner (2014). Bayes factors were calculated on the meta-analytic data for each gender separately and combined. These cumulated Bayes factors were calculated using a half-normal distribution, which is generally more conservative than other models used to represent H1, requiring greater evidence to distinguish evidence for H1 from evidence for H0. The raw effects and Bayes factors are shown in Table 1,

along with the meta-analytic posterior means, standard deviations and 95% credible intervals. The posterior data represents the best representation of the true population parameter given the data collected across all three studies. The meta-analytic 95% credible intervals suggest that the true effect size for both genders combined and individually is likely to be greater than zero. Furthermore, if we calculate the ratio of the Bayes factors for appetite reduction (baby vs. adult animals), we observe that the evidence is considerably larger for females than males, B_{female}/B_{male}=69.67.

[Insert Table 1 about here]

General Discussion

Three studies revealed that women's appetite towards meat declines when meat products are paired with images of a baby animal source. We observed this effect on appetite across four different animal species (cattle, kangaroos, pigs, sheep) and three different meat dishes (each study used a different image of meat). Study 3 showed that this decline in appetite was largest when comparing a baby animal condition with a condition where there is no reminder of the animal source. Reductions in appetite were weaker when contrasting adult animal images with no image. When we focus on the critical animal comparison, babies vs. adults, as we did in our meta-analysis, the data presented here offer strong support for a small effect of babyness on appetite for meat among women (cumulative B = 257.58). The best estimate of the reduction in appetite for women is 13.62, along our 0-100 scale, when comparing baby and adult animals. In contrast, the reduction in men's appetite for meat from baby animals, compared to meat from adult animals, was approximately half that of women (a posterior mean of 6.31 along the 0-100 scale). The pooled data presented here provide weaker evidence (a cumulative B = 3.70) that men experience

a reduction in their appetite for meat when it is from baby animals versus adult animals.

Connections with Prior Work, Limitations, and Future Directions

That the appetite of women was more affected by images of baby farmed animals than the appetite of men is consistent with past research that has found that women tend to be more emotionally responsive to cute babies (Glocker et al., 2009b) and to display caretaking motivations in response to human and animal infants (Glocker et al., 2009a; Sherman et al., 2009). Our findings are also in line with a large literature that has consistently uncovered greater ambivalence, and negative attitudes, towards meat among women, compared to men. Our findings extend this literature by revealing that the impact baby animals have on people's appetite for meat is more strongly observed among women.

Past work on baby animals has focused mainly on pet animals, such as dogs and cats (e.g., Archer & Monton, 2011; Borgi et al., 2014; Borgi & Cirulli, 2013; Levin, Arluke, & Irvine, 2017; Sanefuji et al., 2007; Sherman et al., 2009), while very little work has examined the role of baby status among *farmed* animals or animals traditionally used for meat. Our studies are the first, as far as we are aware, to experimentally manipulate the animal's status as a baby or adult and examine the consequences for appetite towards meat. Our findings suggest perceptions of babyness and accompanied feelings of tenderness can reduce appetite toward meat in the short term, when directly linking thoughts of the meat product to the animal source.

Our findings also extend research on how people judge the moral status of animals (e.g., Piazza et al., 2014) by highlighting babyness as a potential source of moral standing beyond intelligence and harmfulness. Studies show that people loosen

their moral concern for animals, and disregard otherwise morally relevant features (e.g., intelligence), when an animal is categorised as food (Bratanova et al., 2011; Loughnan, Bastian, & Haslam, 2014; Piazza & Loughnan, 2016). Yet ethical concerns for animals can impact on meat enjoyment (Anderson & Barrett, 2016), as can associating meat with the animal source (e.g., Kunst & Hohle, 2016). In our prestudy, we found that people, of both genders, think that baby farmed animals deserve to be protected from harm more so than adult animals. However, images of baby animals as the source of meat only reliably impacted on women's appetite for meat. The overall evidence of the impact that babyness had on men's appetites would conventionally be considered weak and inconclusive, thus, pointing to a potential disconnect between moral concern for farmed animals and appetites. In Study 1 we found no discernible evidence that men's appetite for meat from cows and kangaroos was affected by the baby status of the animal source, and indeed the data showed inconclusive but weak evidence for the null hypothesis. Study 2, using sheep and pigs as the target animals, obtained more positive but still weak evidence that men's appetite was affected by baby relative to adult images. Study 3, which utilised cows as the target, again revealed only inconclusive and weak evidence that reductions in appetite for men existed when comparing babies and adults. When pooling the data within a meta-analysis (see Table 1) we found that the data across all three studies offered weak but ultimately inconclusive evidence for men. In contrast the data overwhelmingly supported the experimental hypothesis for women. Future research should continue to investigate individual differences in the way people utilise information about animals used for meat and how this information impacts on people's appetites, as our results highlight one attributional dimension, babyness, for which gender seems to be an important moderator.

While our findings suggest that there may be some value in using baby animals as images within meat reduction campaigns, it is important to note several limitations of our studies. First, we only examined short-term influences on appetite within cross-sectional designs. It is questionable whether exposure to baby animals would have long-term effects on appetite for meat. Second, Study 3 labelled the animal image ("baby animal," "adult animal"), which raises the question of whether it was the image or the label that carried the effect. Though Studies 1 and 2 did not use labels, further research should continue to isolate these variables. Finally, we measured appetite for meat primarily with rating tasks and not actual food choices. Future studies should examine the influence of baby schemas within actual food selection or point-of-purchase paradigms.

Conclusion

We found that both men and women find baby farmed animals to be cute and vulnerable, and experience feelings of tenderness and warmth towards them. Further, results indicated that female omnivores exhibited temporary reductions in appetite towards meat sourced from baby animals, while the results were less conclusive for male omnivores. Feeling tenderness towards a baby animal appears to be an oppositional force on appetite for meat for many people, especially women. How some individuals are able to keep their affections and appetites separate remains an interesting and important topic for future research.

Notes

1. Bayes factors for omnibus ANOVAs with *k* degrees of freedom depend on assumptions of independent *k* contrasts which is difficult to theoretically determine. Our hypotheses are sufficiently tested using Bayes factors conducted on analyses where df=1. We know of past research that has reported omnibus (df>1) *B*s but only for completeness and after acknowledging that none of the conclusions were drawn from the omnibus *B*s (see Lush, Naish & Dienes, 2016).

2. The conclusions drawn from the data in Study 1 do not change when all 361 participants are included in the analysis.

3. See Dienes (2008, box 4.5, p.94) for an overview of Bayesian updating used by the calculator. The corresponding R script has been provided in the supplemental materials.
http://www.lifesci.sussex.ac.uk/home/Zoltan_Dienes/inference/bayes_normalposterior.swf.

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Table 1.

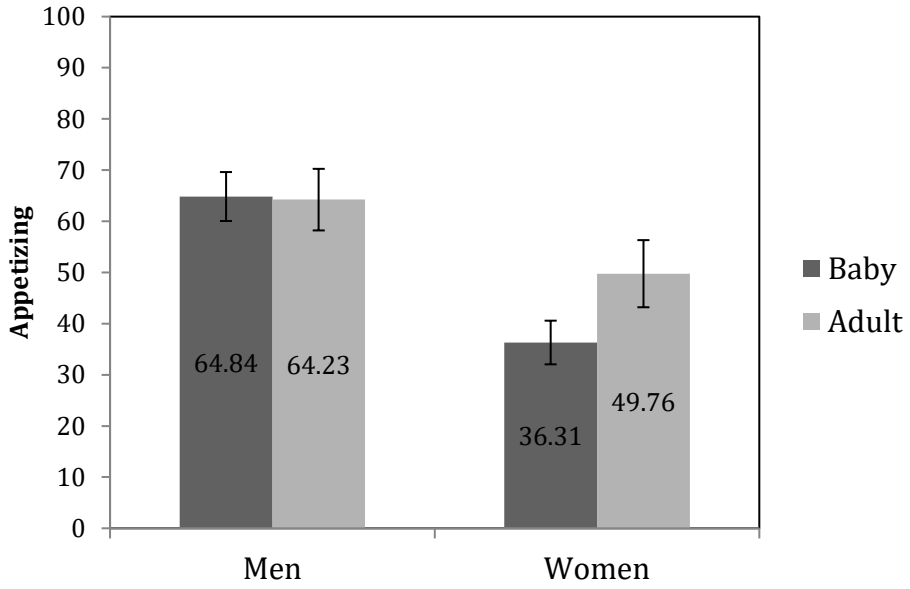
Bayesian meta-analysis of data across Studies 1-3 investigating the experimental hypothesis that participants reduce their appetite for meat when associating meat with baby animals, compared to adult animals. Statistics given for both genders combined, and each individually.

Study	Mean diff [adult -baby]	SE	t	Study $B_{U[0\text{-}20]}$	Cumulative $B_{H(0, 10)}$	Posterior Mean	Posterior SD	Meta 95% Credible Interval
Both genders								
1	4.97	2.96	1.68	1.44				
2	10.14	3.34	3.04**	42.24	70.90	7.24	2.21	2.90, 11.59
3	12.18	4.59	2.66*	18.62	1271.41	8.18	1.99	4.27, 12.09
Women								
1	13.44	8.90	1.51	2.46				
2	12.41	5.14	2.41*	10.95	23.75	12.66	4.45	3.94, 21.39
3	15.80	6.73	2.35*	9.62	257.58	13.62	3.71	6.34, 20.89
Men								
1	-0.62	6.86	-0.10	0.40				
2	8.19	4.45	1.84^{+}	2.92	1.71	5.58	3.73	-1.74, 12.90
3	8.02	5.73	1.40	1.72	3.70	6.31	3.13	0.18, 12.44

$^{+}$ $p < .10$. *$p < .05$. **$p < .01$.

747 **Figure 1.**

748 Appetite for meat means and standard errors by gender and babyness (Study 1).



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753 **Figure 2.**

754 Appetite for meat means and standard errors (±1 S.E.) by gender, babyness, and

755 animal type. Left side: Pigs. Right side: Sheep (Study 2).

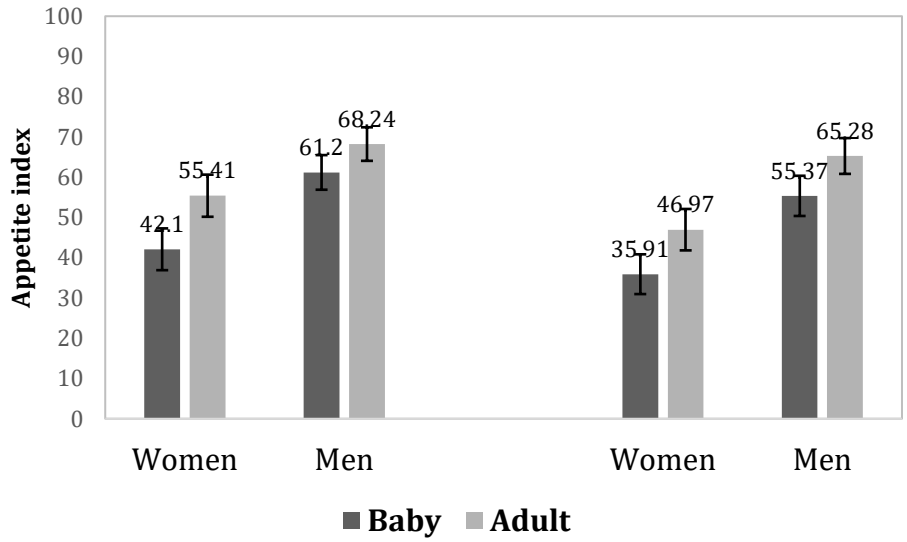

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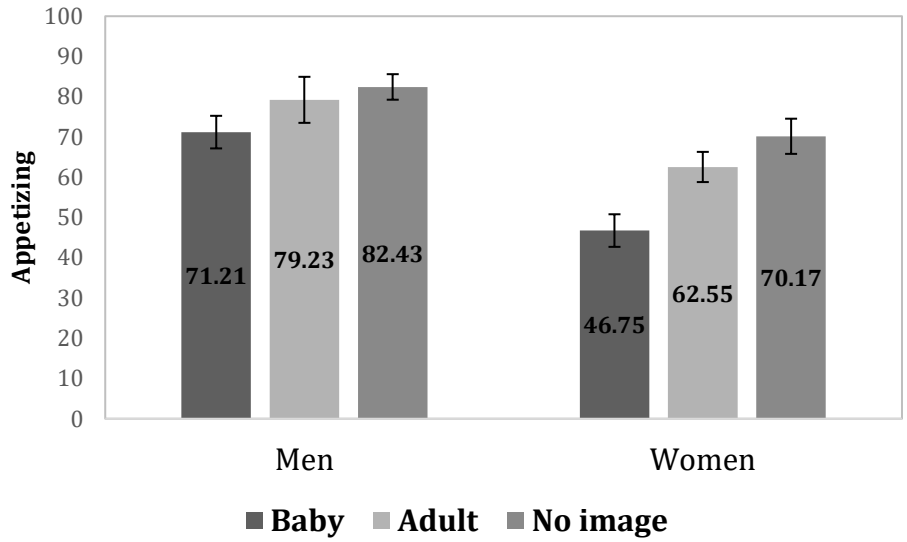
Figure 3.

Appetite for meat means and standard errors (±1 S.E.) by gender and animal condition (Study 3).



Supplementary Materials

Prestudy

Method

Participants. The sample was recruited via Amazon's Mechanical Turk. Fifty-seven workers started the study, but only 45 completed it or passed a Captcha bot check. This included 18 males, 27 females (M_{age} = 33.57 years, *SD* = 10.94), 89% White, 11% other ethnicity. All participants were located in the United States and were paid $1.00 for their time; 76% were omnivore ("eat meat and other animal products, like dairy and/or eggs"), 11% semi-vegetarian ("eat meat, but only on rare occasions or only certain types of meat"), 2% lacto- or ovo-vegetarian ("eat dairy products and/or eggs, but no meat or fish"), 4% strict vegetarian ("eat no animal products, including dairy and eggs, but would not consider myself full 'vegan'"), and 7% vegan ("eat no animal products, including dairy, eggs, honey, etc., and avoid all non-food animal products").[1]

Procedure and materials. The first author selected five baby images and five adult images of pigs, sheep, cattle, and chickens using Google Images. Most of the photos depicted the full body of the animal, either with a frontal or side profile, though a few images focused on the face with the body partly cropped out. Participants were presented a random set of half (n=20) of the animal images, and rated each on seven measures, all on 1-9 scales (1 = *Not at all*; 9 = *Extremely*). Four items captured perceptual and affective aspects of neoteny: "How cute is this animal?"; "How vulnerable is this animal?"; "How warm does this animal make you feel?"; "How tender does this animal make you feel?" The four measures (cute, vulnerable, warm, tender) were highly internally reliable (Cronbach's α = .98), and

[1] Since Study 1 did not involve any measure of appetite for meat, it was deemed acceptable to retain vegetarians and vegans in the sample.

thus they were averaged together to form a *babyness* index. Intelligence was measured with one item: "How intelligent is this animal?" Harmfulness was measured with one item: "How dangerous is this animal?" The final item was a measure of moral standing: "How morally wrong would it be to harm this animal?" (adapted from Piazza, Landy, & Goodwin, 2014). All participants were debriefed at the end. No other measures or conditions were used.

Results

Because participants rated only a subset of the images, mean scores were calculated for the four measures (babyness, intelligence, harmfulness, moral standing) across the 40 images, and the mean scores for each image were treated as cases (N = 40) in the subsequent analyses. Table S1 presents the zero-order correlations for the four measures. The babyness index correlated highly (and positively) with moral standing judgments, but was unrelated to ratings of intelligence, and was highly (and negatively) correlated with appraisals of harmfulness. Finally, intelligence correlated weakly and non-significantly with moral standing, while ratings of harmfulness correlated significantly (and negatively) with moral standing.

Table S1.

Pearson's correlations between the measures used in prestudy. The correlations were calculated using the mean scores for the animal images (N=40) as individual cases.

	Intelligence	Harmfulness	Moral Standing
Babyness	.00	-.82***	.93***
Intelligence	-	.16	.11
Harmfulness	-	-	-.65***
Moral standing	-	-	-

Collapsing across animal category, the baby farm animals (n=20) were rated substantially higher on babyness (M = 6.97, SD = .60) than the adult farm animals (M = 4.43, SD = .51), $t(38)=14.42$, $p < .001$, $B_{U[0-2)]} = 5.43 \times 10^{39}$, confirming the success of the image selection. The baby animals were also rated less harmful (M = 1.47, SD = .24) than the adult animals (M = 2.72, SD = .69), $t(38) = -7.58$, $p < .001$, $B_{U[0-2)]} = 3.60 \times 10^{12}$, but the baby and adult animals were rated equally intelligent (M_{babies} = 4.15, SD = .74; M_{adults} = 4.18, SD = .82), $t(38) = .12$, $p = .905$, $B_{U[0-2)]} = 0.173$. Overall, the baby animals generated more moral concern (M = 6.77, SD = .63) than the adult animals (M = 5.17, SD = .66), $t(38) = 7.83$, $p < .001$, $B_{U[0-2)]} = 1.32 \times 10^{12}$.

To test the independent contributions of babyness and harmfulness to moral concern for the animals, we conducted a linear regression entering babyness and harmfulness simultaneously into the model as predictors of moral standing (intelligence was not included in the model, since it did not correlate significantly with moral standing judgments). Babyness was a strong, independent predictor of moral standing, $\beta = 1.18$, $t(37) = 12.49$, $p < .001$, $B_{U[0-2)]} = 2.40 \times 10^{36}$, alongside harmfulness, $\beta = .32$, $t(37) = 3.34$, $p = .002$, $B_{U[0-2)]} = 62.72$ (multicollineary between babyness and harmfulness was not an issue, Tolerance = .33, VIF = 3.00).

Discussion

The results of this prestudy support the hypothesis that perceptions of baby animals and feelings of tenderness towards them contribute to the moral standing of farmed animals, over and above the contribution of intelligence and harmfulness—two factors that previous studies have found to be important predictors of moral attitudes towards animals (e.g., see Bastian, Loughnan, Haslam, & Radke, 2012; Gray, Gray, & Wegner, 2007; Piazza et al., 2014; Piazza & Loughnan, 2016; Sytsma

& Machery, 2012). Furthermore, while babyness and harmfulness were (negatively) correlated, they independently predicted judgments of moral standing, which suggests they are related yet separate constructs.

Images used in Prestudy

Baby animals

Chick 1 – Babyness mean = 7.63, Moral standing = 7.64

Chick 2 – Babyness mean = 7.35, Moral standing = 7.18

Chick 3 – Babyness mean = 7.33, Moral standing = 7.59

Chick 4 – Babyness mean = 7.36, Moral standing = 7.15

Chick 5 – Babyness mean = 7.67, Moral standing = 7.52

Piglet 1 – Babyness mean = 6.24, Moral standing = 6.30

Piglet 2 – Babyness mean = 6.25, Moral standing = 6.13

Piglet 3 – Babyness mean = 6.73, Moral standing = 6.68

Piglet 4 – Babyness mean = 7.31, Moral standing = 7.25

Piglet 5 – Babyness mean = 6.24, Moral standing = 6.30

Lamb 1 – Babyness mean = 7.55, Moral standing = 6.90

Lamb 2 – Babyness mean = 7.30, Moral standing = 7.18

Lamb 3 – Babyness mean = 6.99, Moral standing = 6.86

Lamb 4 – Babyness mean = 7.81, Moral standing = 7.50

Lamb 5 – Babyness mean = 7.41, Moral standing = 7.00

Calf 1 – Babyness mean = 7.17, Moral standing = 6.67

Calf 2 – Babyness mean = 6.94, Moral standing = 6.57

Calf 3 – Babyness mean = 6.08, Moral standing = 6.16

Calf 4 – Babyness mean = 6.07, Moral standing = 5.43

Calf 5 – Babyness mean = 6.08, Moral standing = 5.77

Adult animals

Chicken 1 – Babyness mean = 4.52, Moral standing = 4.52

Chicken 2 – Babyness mean = 3.78, Moral standing = 3.88

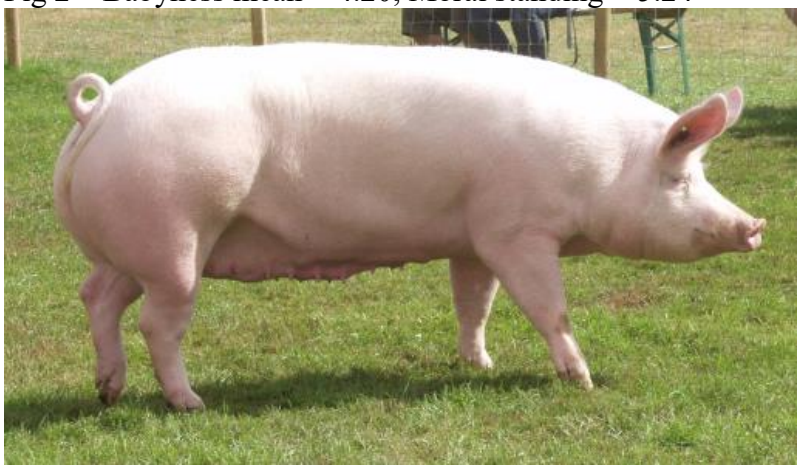
Chicken 3 – Babyness mean = 4.61, Moral standing = 5.24

Chicken 4 – Babyness mean = 5.10, Moral standing = 5.38

Chicken 5 – Babyness mean = 3.90, Moral standing = 4.09

Pig 1 – Babyness mean = 5.16, Moral standing = 5.62

Pig 2 – Babyness mean = 4.20, Moral standing = 5.24



Pig 3 – Babyness mean = 4.43, Moral standing = 5.22

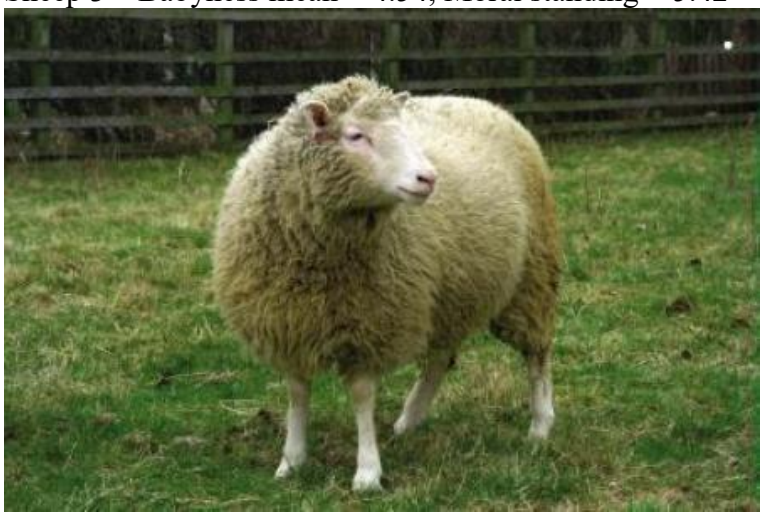
Pig 4 – Babyness mean = 4.22, Moral standing = 4.83

Pig 5 – Babyness mean = 4.89, Moral standing = 5.48

Sheep 1 – Babyness mean = 4.47, Moral standing = 5.09

Sheep 2 – Babyness mean = 5.07, Moral standing = 6.04

Sheep 3 – Babyness mean = 4.54, Moral standing = 5.42



Sheep 4 – Babyness mean = 5.17, Moral standing = 6.50

Sheep 5 – Babyness mean = 4.63, Moral standing = 5.79

Cattle 1 – Babyness mean = 3.53, Moral standing = 4.16

Cattle 2 – Babyness mean = 3.92, Moral standing = 5.35

Cattle 3 – Babyness mean = 4.32, Moral standing = 4.87

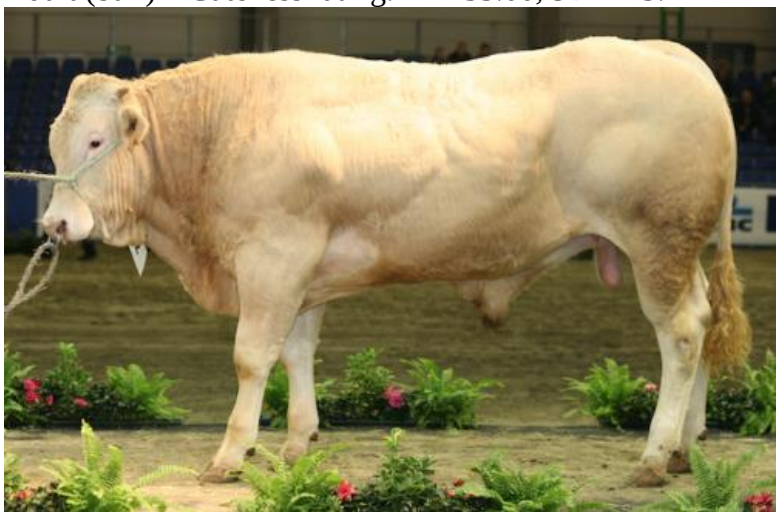
Cattle 4 – Babyness mean = 4.45, Moral standing = 5.86

Cattle 5 – Babyness mean = 3.56, Moral standing = 4.91

Images used in Study 1

Baby (calf) – Cuteness rating: *M* = 83.28, *SD* = 19.74

Adult (bull) – Cuteness rating: *M* = 35.00, *SD* = 25.11



Baby (joey) – Cuteness rating: *M* = 87.41, *SD* = 19.22

Adult (kangaroo) – Cuteness rating: *M* = 61.45, *SD* = 25.83

Meat dish (actually kangaroo meat)

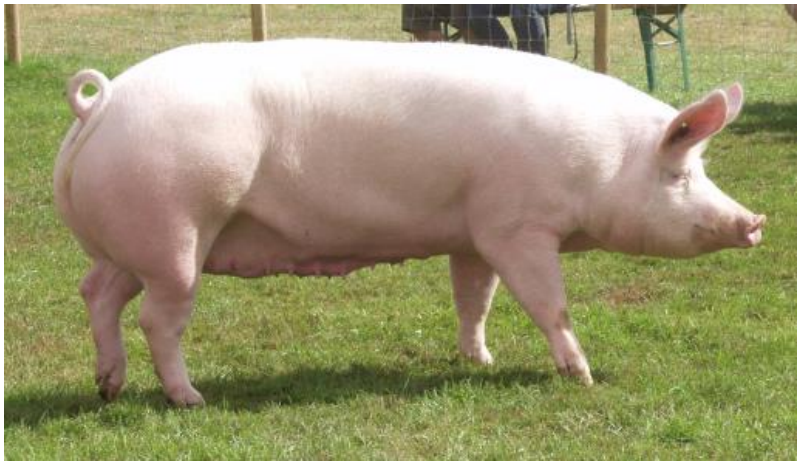
Images used in Study 2

Baby – lamb

Adult – sheep

Baby – piglet

Adult – pig

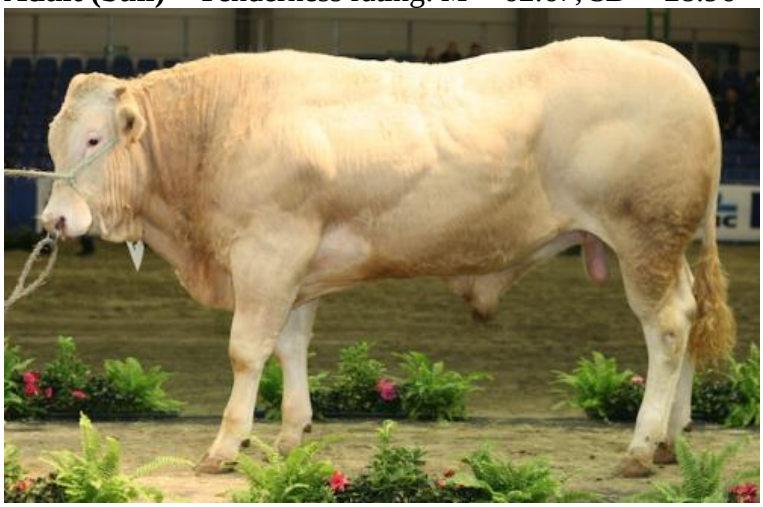


Meat dish (actually lamb chops)

Images used in Study 3

Baby (calf) – Tenderness rating: *M* = 79.07, *SD* = 23.71

Adult (bull) – Tenderness rating: *M* = 62.67, *SD* = 28.96



Meat dish (actually beef steak)

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