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Addressing behavior and policy around meat: Associating factory farming with animal cruelty “works” better than zoonotic disease

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Abstract

Research on shifting attitudes or behaviours surrounding the use of animal products traditionally focuses on animal cruelty. How this approach may differ from exposure on the zoonotic disease transmission risk factory farms pose, is unclear. The present study sought to examine how information regarding zoonotic disease may stimulate concern for animals/ concern for human health, respectively, and thus predict lower willingness to consume meat, when compared to animal cruelty and a control condition. The extent to which such information could shift support for changing conditions on factory farms was also examined. In a preregistered experiment ($N = 454$), participants were exposed to an informative paragraph on either a) zoonotic disease transmission risk from factory farming, b) animal cruelty on factory farms, or c) a control paragraph. Those in the animal cruelty condition were significantly more likely to indicate lower meat consumption willingness and higher support for changing conditions on factory farms, when compared to the two other conditions. Concern for animal health and welfare mediated the relationship between the combined experimental conditions and both dependent variables, when compared to the control condition. Upon examining the moderating role of human supremacy beliefs, a conditional effect was found with higher human supremacy beliefs predicting higher meat consumption willingness and lower support for changing conditions on factory farms, across all conditions. This study offers evidence for the intervention potential of informative excerpts. These findings also emphasize animal cruelty as a more effective way to mobilize support for behaviours and policies aimed at reducing animal product consumption.

Keywords: factory farming, meat consumption, animal cruelty, zoonotic disease, COVID-19

Introduction

The human use of other animals for food is problematic for multiple reasons. For example, animals on factory farms are kept in unhygienic conditions (Fiber-Ostrow & Lovell, 2016) where they often cannot move, stand, or breathe fresh air (Appleby et al., 2004). Additionally, livestock production generates nearly a fifth of the world's greenhouse gases, along with major contributions to soil, air, and water pollution globally (Alvarado et al., 2021; Anastasiadis, 2004; Gerber et al., Food and Agriculture Organization of the United Nations, 2013; Godfray et al., 2018; Steinfeld et al., 2006). Further, diseases borne on factory farms pose public health risks (Bueno-Marí et al. 2015; Karesh et al., 2012), meat can be damaging to the humans who consume it (Wolk, 2017; Zhong et al., 2020), and humans who work in slaughterhouses often experience physical and psychological harm (Blanchette, 2019; Mitloehner & Calvo, 2008), with harm spilling over to the general community in the form of increased crime (Fitzgerald, 2009). It is no surprise then, that calls have been made for human diets to transition toward plant-based options (e.g., Humane Society International, 2022; Intergovernmental Panel on Climate Change, 2019).

Attempts to shift attitudes and behaviours about the use of animals for food traditionally focus on drawing attention to animal cruelty on factory farms (Freeman, 2010; Mathur et al., 2021). Although these have been effective in reducing the purchase or consumption of meat (Mathur et al., 2021), multiple approaches are likely necessary to engage a broader range of people, and research on the effectiveness of other approaches is needed. One such approach, especially amid the COVID-19 pandemic, is drawing attention to the conditions on factory farms being harmful to humans. Zoonotic diseases – such as COVID-19 – are those transmitted from animals to

humans via human exposure to animals or animal products. These will often emerge on factory farms before spreading to humans (Karesh et al., 2012). Drawing attention to zoonotic disease transmission risk or to animal cruelty on factory farms has the potential to impact willingness to consume animal products and to support changing policies related to factory farming. It is currently unclear however, whether this approach is effective (e.g., Dhont et al., 2021).

Exploring Ways to Shift Attitudes

Many meat-eaters are motivated to continue meat consumption and may actively avoid or disregard information that makes them feel uncomfortable with their consumption habits (Dhont et al., 2021; Leach et al., 2022; Piazza, 2020; Rothgerber & Rosenfeld, 2021). However, when information about the harm on factory farms is unavoidable and explicit, some people may change their attitudes. That is, some may be less willing to eat meat or more willing to support changing conditions on factory farms in light of such information. Of course, there are different aspects of factory farming to focus on in interventions. We sought to examine and compare the outcomes of explicitly presenting information on two different aspects of factory farming: animal cruelty and zoonotic disease risk.

Animal Cruelty

Support for animal rights and opposition to animal cruelty are common reasons for adopting and maintaining a plant-based diet (Kerschke-Risch, 2015; Rosenfeld & Burrow, 2017). Gaining awareness of animal cruelty has a longstanding history as an effective way to shift attitudes. A systematic review (Mathur et al., 2021) suggested that animal welfare interventions appear effective in short-term studies where outcomes involved self-report or intended future behaviour

and lower consumption was indicated. Tonsor and Olynk (2011) found that long-term demand for pork and poultry was hindered by increases in animal welfare issues addressed by the media. Experimental work also showed that targeting moral disengagement through displaying distressing animal agriculture scenes, followed by discussions on the feelings the video elicited can lead to more negative evaluations of meat and greater willingness to reduce meat consumption (Buttlar et al., 2021).

When evaluating support for policy change, Harris et al. (2022) found that providing information about animal welfare reforms did not increase opposition to animal farming, whereas providing information about the cruelty of current practice increased opposition. Given this work, we expected that presenting information about animal cruelty on factory farms would lead to lower willingness to eat meat and greater support for changing conditions on factory farms. We were curious, however, how this might compare to presenting information of zoonotic disease risk on factory farms, at a time when concern about zoonotic disease (COVID-19) was high.

Zoonotic Disease

Health concerns are an additional leading motive for adopting/maintaining a meat-free diet (Fox & Ward, 2008; Hopwood et al., 2021). This typically reflects concerns with optimizing one's personal health and fitness. Although it has yet to be examined, concerns about avoiding zoonotic disease may tie into this. With no clear consensus on whether animal or health motivations are more effective in shifting attitudes toward animal consumption (De Backer & Hudders, 2014; de Boer et al., 2017; de Oliveira Padilha et al., 2022), we opted to compare the

effects of information about zoonotic disease risk on factory farms to information about animal cruelty on factory farms.

The COVID-19 pandemic heightened public discourse around zoonotic disease. This could influence attitudes toward consuming meat. Research conducted following Hong Kong's SARS outbreak in 2003 indicated increased consumer concern with health (Lau et al., 2005). Wen et al. (2019) examined poultry purchase intentions during the 2013 avian influenza: the more a person believed that purchasing chicken products was a risk, the less likely they were to purchase chicken. A U.S. poll gauged the public's recognition of disease risk from animal agriculture and although 43.7% of participants indicated support for restrictions on animal agriculture to help prevent pandemics, only 15% agreed there is a direct link between disease outbreaks and livestock farming (Beggs & Anderson, 2020). When considering dietary changes, results were split: 17.9% indicated they were more likely to reduce meat intake, yet 17.0% reported they were less likely than before to reduce meat intake. Recent work by Dhont et al. (2021) suggests zoonotic disease information may not be as effective at shifting attitudes. Participants blamed infectious diseases on factory farms and global meat consumption less than wild animal trade and consumption or lack of government preparedness. This was particularly evident for those indicated as meat-committed persons.

Like information about animal cruelty on factory farms (Bastian & Loughnan, 2017; Loughnan et al., 2014) the above evidence suggests that people may be similarly resistant to information linking zoonotic disease with factory farms. Nonetheless, given that animal rights and health are primary motivations to forgo meat (De Backer & Hudders, 2014; de Boer et al., 2017), we

expected that information regarding animal cruelty/ zoonotic disease on factory farms could stimulate concern for animals/ concern for human health, respectively, and thus predict lower willingness to consume meat and/or greater support for changing conditions on factory farms. Past studies have suggested that informative interventions can effectively induce concern and this concern can subsequently shift attitudes towards meat and factory farms (Cordts et al., 2014; Mathur et al., 2021). We expected that both types of information would be effective in doing this, but in light of the salience of and concern about COVID-19 at the time the research was conducted, we expected that the zoonotic disease (vs. animal cruelty) information would be particularly effective.

We also considered a potential moderator of these effects, human supremacy beliefs (HSB)- the extent to which one believes that humans are superior over other animals. Research has revealed that stronger endorsement of HSB is associated with higher meat consumption and stronger support for animal exploitation (Dhont & Hodson, 2014), making it likely that individuals higher in HSB would be particularly resistant to the effects of animal cruelty information (and possibly information about the risks of factory farming in general). Interestingly, a recent study revealed that among those higher in HSB who consume less meat, health and environmental (vs. animal-related) motives for doing so were cited (Weber & Kollmayer, 2022), suggesting that the zoonotic disease information could be more effective for those higher in HSB. Prior awareness of the connection between factory farming and zoonotic disease/animal cruelty was also gauged to see where the sample stood on awareness of these issues.

Hypotheses

We predicted that when comparing both experimental (zoonotic & animal cruelty) conditions to the control condition, there would be lower meat consumption willingness and greater support for changing the conditions on factory farms (Hypothesis 1). We also predicted that there would be lower meat consumption willingness and greater support for improving farm conditions in the zoonotic (vs. cruelty) condition (Hypothesis 2). Additionally, we predicted that the effects predicted in Hypotheses 1 and 2 would be weaker among those higher (vs. lower) in human supremacy beliefs (Hypothesis 3). These hypotheses were pre-registered through AsPredicted (56471) (https://aspredicted.org/NH9_G6P). For exploratory purposes, we also examined concerns for animals and concerns for humans as potential mediators of the relationship between the manipulation and meat consumption willingness.

Method

Participants

Ethics approval was received from the University of Calgary Conjoint Faculty Research Ethics Board (REB20-1621). Undergraduate students ($N = 454$, $Mage = 20.00$ years, $SD = 3.07$, Range: 17-47 years) at a Canadian (Alberta) University completed a 30-minute online survey for course credits. Participants were excluded from the analyses if they failed both attention checks and the manipulation check, or if they did not provide consent for their data to be used. The original sample had 469 participants; however, 10 participants failed the manipulation check and both attention checks and 5 did not re-consent to their survey data being used, reducing the sample to 454 participants. This included 234 women, 215 men, 3 nonbinary participants, and 2 transgender men. Ethnicity of the participants included Aboriginal/Indigenous/Inuit (1.1%),

Black (3.8%), East Asian (17.2%), European/White (39.3%), Hispanic or Latino (4.4%), Middle Eastern (including Northern African, West Asian, Arabic, and others) (5.5%), Pacific Islander or Native Hawaiian (0.4%), South Asian (21.6%), Southeast Asian (13.7%). In terms of diet, 89.8% indicated eating both meat and fish, 0.9% self-identified as pescatarian, 5.7% self-identified as vegetarian, and 1.5% self-identified as vegan.

Procedure

After providing consent, participants completed Dhont and Hodson's (2014) human supremacy beliefs scale (e.g., 'There is nothing unusual at all in the fact that humans dominate other animal species.'). Six items rated on a 7-point scale (1= *Strongly disagree*; 7= *Strongly Agree*) were averaged, after reverse-coding three items; higher scores indicated higher human supremacy beliefs ($\alpha = .84$). Participants reported their age, gender, ethnicity, and dietary status. Next, participants were randomly assigned to one of the three conditions. Each condition included a brief paragraph that either highlighted the connections between zoonotic diseases and factory farming, animal cruelty and factory farming, or a description of the activity of geocaching (i.e., control condition). In the *zoonotic disease* experimental condition, an example statement was "Scientists have been warning us for many years that factory farms are one of the most alarming causes of infectious diseases". In the *animal cruelty* experimental condition, an example statement was "Experts have been arguing for many years that factory farms are one of the most alarming causes of animal cruelty". In the *control condition*, an example statement was "In essence, geocaching is a GPS-enabled treasure hunt". Participants then completed the following measures in the following order (unless otherwise noted). Full paragraphs used in each condition

and all measures can be found in the online supplement:

https://osf.io/d4w73/?view_only=42adcfd626294ca5928f9f30429b0b69.

Concern for Human Health/Welfare and Animal Health/Welfare

Participants specified the extent to which they agreed with statements reflecting concern for human health/welfare and animal health/welfare (e.g., ‘How much do you care about human health/welfare?’). The six items created by the authors were rated on a 7-point scale (1= *Not at all*; 7= *Very much*). All items were averaged, with higher scores indicating higher concern for human health/welfare and animal health/welfare ($\alpha = .89$).

Meat Consumption Willingness

The attitudes participants held towards their current consumption of meat (e.g., ‘To what extent do you want to reduce your consumption of animal products from factory farms?’) were measured by this scale (modified from Earle et al., 2019 ($\alpha = .93$)). The three items were rated on a 7-point Likert scale (1= *Not at all*; 7= *Very much*). All items were averaged, with higher scores indicating a higher willingness to consume meat ($\alpha = .87$).

Support for Changing Conditions on Factory Farms

The extent to which participants would endorse altering conditions on factory farms (e.g., ‘Improving hygiene on factory farms’) was measured by this scale. The five items created by the authors were rated on a 7-point Likert scale (1= *Not at all*; 7= *Very much*). All items were averaged, with higher scores indicating stronger support for changing the conditions on factory farms ($\alpha = .87$).

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229 ***Manipulation check***

230 The manipulation check asked participants which topic their vignette addressed (i.e., animal
231 cruelty, zoonotic disease, or geocaching).

232

233 ***Prior Awareness of Animal Cruelty, Zoonotic Diseases, and Factory Farming***

234 Participants indicated their prior awareness of the connection between animal cruelty, zoonotic
235 diseases, and factory farming (e.g., ‘Before participating in this study, I was aware of the
236 connections between animal cruelty and factory farming’). The three items created by the authors
237 were rated on a 7-point Likert scale (1= *Strongly disagree*; 7= *Strongly Agree*). The items were
238 averaged with higher scores indicating higher previous awareness ($\alpha = .71$).

239

240 ***Attention checks***

241 The first attention check was placed directly after the vignette and asked, “What is two plus
242 six?”. The second was placed before the last prior awareness item and stated, “This is an
243 attention check question. Please choose disagree as your answer”.

244 All measures appear in the supplemental material.

245

246 **Results**247 ***Preliminary Analysis***

248 The data were checked for outliers (more than three standard deviations from the mean). Three
249 participants were deemed outliers and as per our pre-registration decision, these scores were
250 winsorized (i.e., converted to values at three standard deviations from the mean). Table 1

displays descriptive statistics and correlations. Table 2 displays means and standard deviations by condition.

Primary Analysis

Multiple regression analyses with the manipulation represented by orthogonal contrast codes were used to examine our hypotheses. Orthogonal contrasts assign numerical weights to compare conditions or groups of conditions with others (Cohen et al., 2003). Contrast 1 compared the two experimental conditions (zoonotic disease and animal cruelty) to the control condition ($-2/3$, $1/3$, $1/3$), and contrast 2 compared the zoonotic condition to the cruelty condition (0 , $-1/2$, $1/2$).¹ First, meat consumption willingness was regressed on the two experimental conditions versus the control, the zoonotic condition versus the cruelty condition, and mean-centered human supremacy beliefs (HSB), as well as the interaction terms between mean-centered HSB and each of the two contrast variables. All five variables were entered simultaneously. This same regression analysis was then repeated separately with support for changing conditions on factory farms as the dependent variable.

For meat consumption willingness, the experimental conditions against the control condition was a significant predictor ($\beta = -0.13$, $SE = 0.14$, $p = .001$), revealing that participants in the control condition were significantly more willing to consume meat in comparison to the experimental conditions combined, supporting H1. The contrast between the zoonotic and cruelty conditions was also significant ($\beta = 0.10$, $SE = 0.17$, $p = .016$). Those in the zoonotic disease condition were unexpectedly more willing to consume meat in comparison to the animal cruelty condition (contrary to H2). HSB was also significant ($\beta = 0.46$, $SE = 0.05$, $p < .001$), such that those higher

in HSB had a significantly higher willingness to consume meat. No interaction terms were significant (see Table 3).

For changing conditions on factory farms, the experimental conditions against the control condition was a significant predictor ($\beta = 0.13$, $SE = 0.11$, $p = .002$). Participants in the experimental conditions combined were significantly more likely to support changing conditions on factory farms in comparison to the control condition (supporting H1). The contrast between the zoonotic and cruelty conditions was also significant ($\beta = -0.12$, $SE = 0.120$, $p = .003$), such that those in the animal cruelty condition were significantly more likely to support changing conditions on factory farms when compared to the zoonotic disease condition (contrary to H2). HSB was also significant ($\beta = -0.51$, $SE = 0.04$, $p < .001$). Those higher in HSB were significantly less likely to support changing conditions on factory farms. However, no interaction terms were significant (see Table 3).

Mediation analyses using Hayes Process macro model 4 in SPSS (Hayes, 2013) were performed to examine the mediating role of concern for animal health and welfare, or the separate role of concern for human health and welfare, in the relationship between manipulation and meat consumption willingness or support for changing conditions on factory farms. There was a significant effect of condition on concern for animal health and welfare when comparing the control condition to the experimental conditions combined (IV on Mediator: $b = .35$, $SE b = .13$, $p = .041$), but not when comparing the two experimental conditions. There was no effect of condition, among either of the contrasts, when looking at concern for human health and welfare.

Concern for animal health and welfare mediated the relationship between the experimental conditions against the control condition and meat consumption willingness (indirect effect: -.23, 95% CI [-.40, -.06]), as well as between the experimental conditions against the control condition and support for changing conditions on factory farms (indirect effect: .20, 95% CI [.05, .35]. This suggests that compared to the control group, those in the experimental groups were less likely to endorse meat consumption willingness and more likely to indicate support for changing conditions on factory farms. This effect can be partially explained by the participants' concern for animal health and welfare.

However, concern for animal health and welfare did not mediate the relationship between the zoonotic versus cruelty conditions and meat consumption willingness or changing conditions on factory farms. Human health and welfare did not act as a mediator in any of the analyses. It appears that the experimental conditions resulted in heightened concern for animals, which in turn, was associated with decreased meat consumption willingness and increased support for changing conditions on factory farms (see Table 4).

Discussion

We examined two possible strategies for influencing meat consumption willingness and support for changing factory farming conditions. Hypothesis 1 — that when comparing both experimental conditions to the control condition, there would be lower meat consumption willingness and greater support for improving factory farming conditions — was supported. The animal cruelty condition demonstrated effectiveness in shifting attitudes however, the zoonotic disease condition did not differ significantly from the control.² Hypothesis 2 — that when

comparing the zoonotic condition to the animal cruelty condition, there would be lower meat consumption willingness and greater support for improving factory farming conditions — was not supported. Those in the animal cruelty condition had significantly lower meat consumption willingness and significantly higher support for changing conditions on factory farms. Even at a time where human health fears may have been heightened given the context of the COVID-19 pandemic, animal cruelty (vs. zoonotic disease) information still has a stronger impact. This is consistent with recent findings that zoonotic concerns are relatively dismissible in contexts linked to meat (Dhont et al., 2021). Contrary to predictions, human supremacy beliefs did not moderate either contrast.

This then raises the question, why did animal cruelty information impact outcomes significantly more than information about the threat of zoonotic disease? This could potentially be due to participants viewing animal cruelty as more emotionally arousing and morally relevant (Feinberg et al., 2019; Herchenroeder et al., 2022). The zoonotic disease condition may not evoke the same visceral feelings that reading about animal cruelty could. Pre-established associations of COVID-19 origins in Wuhan, China may have also made the risk that factory farms pose resonate less with participants. Participants may have dismissed the potential for factory farms to generate zoonotic diseases to the same direct extent that a wet market with wild animals could (Beggs & Anderson, 2020; Dhont et al., 2021). Research also suggests that the threat of zoonotic diseases may resonate less within the age group we examined. A North American online survey with a sample average age close to the present study (28.6 years) found that a significant number of individuals believed they were at less risk of contracting the disease, when compared to the

general population (Beggs & Anderson, 2020). The possibilities are speculative at this point but could be examined in future work.

The insignificance of the predicted interactions suggests that the experimental effects were similar for both those lower and higher in HSB. These results demonstrate that the intervention “works” regardless of variation in the extent to which one views humans as hierarchically above other animals. Our results did show that HSB was correlated with prior awareness of zoonotic disease risk and animal cruelty such that as HSB increased, awareness decreased. This suggests that despite generally having lower awareness, those high in HSB still were not differentially influenced by any of the manipulations. Awareness was also associated with lower meat consumption willingness and greater support for changing conditions on factory farms, consistent with previous work (Harguess et al., 2020).

Implications

Although we had expected that zoonotic disease information would influence outcomes more strongly given the life-changing and ever-salient COVID-19 pandemic, our results fall in line with previous work (Buttlar et al., 2021; Harris et al, 2022; Mathur et al., 2021), in which animal cruelty was demonstrated to be a more effective connection to underscore. This further establishes the intervention potential of exposure to such informative excerpts, coinciding with past research (Amiot et al., 2018). Companies seeking to persuade consumers to reconsider their dietary choices, such as plant-based alternatives, can use this insight for marketing strategies.

There are also broader implications for both public health and policy making. It appears to be difficult for people to comprehend the danger factory farm conditions will continue to pose if changes are not made. A lack of understanding of local risk, such as the threat of zoonotic disease outbreaks on factory farms, will be a barrier in fostering preventative action. The human-animal relations discourse surrounding the COVID-19 pandemic has largely been focused on exotic animal consumption and so, efforts to educate the public on how their own behaviour can minimize the risk of future outbreaks will be critical. If preventative behaviour (eating less meat, supporting changing factory farming systems) is motivated more by a focus on animal cruelty than zoonotic disease, then perhaps emphasizing the treatment of animals on factory farms may prove to be a more effective way to mobilize public concern and to promote support for policies seeking to prevent future outbreaks. Thus, although companies, policy makers, or lobbyists may be tempted to employ zoonotic disease arguments in an attempt to reduce meat consumption, our results demonstrate that this will not be as effective as animal cruelty information.

Limitations and Future Directions

First, our study is limited in that our manipulation involved reading informative paragraphs. Although this is often how people acquire new information, participants may have struggled to visualize the information (Law, 2009). Presenting the same information through videos and/or virtual reality would likely be more effective, consistent with evidence that these are successful advocacy tools (Faunalytics, 2017; Herchenroeder et al., 2022; Herrewijn et al., 2021). Our study was also limited in our focus on self-reported attitudinal measures rather than objective behavioural measures. As with all self-report data, it may be subject to bias and in particular, social desirability. Our study also only reflects attitudes immediately after reading the

manipulation paragraph and it is unclear if long-term attitude shifts would occur. It is also worth acknowledging that internal validity may have been reduced through minor phrasing differences between the manipulation paragraphs (e.g., “scientists have been warning” [zoonotic disease condition] vs. “experts have been arguing” [animal cruelty condition]).

Timing is another limitation, as participants may have felt a sense of “covid fatigue”. Due to the amount of time that the pandemic had already been going on for (11 months at data collection), stronger initial concern may have faded, leaving some potentially more indifferent (Zerbe, 2020). Given the sample of undergraduate students who were in a psychology course at the time, the generalizability is also worth considering. Links have been identified between higher education and a lower likelihood of consuming beef or pork (Guenther et al., 2005) and with an increased likelihood of following a vegetarian diet (Hoek et al., 2004). With a mean age of 20 among our sample, it is important to consider potential age-related impacts. A Canadian survey showed that of those identifying as vegetarian or vegan, more than half are under the age of 35 (Charlebois et al., 2018). This suggests that even though the vast majority of our participants did not identify as vegetarian, they are likely to know those who are or to potentially be more open to the concept.

Additionally, research indicates that political orientation, specifically a desire for more economic equality and greater tolerance of outgroups, is related to concern for farm-animal welfare (Deemer & Lobao, 2011; see also Dhont et al., 2016, Study 3). University samples tend to reflect these more liberal-leaning views, especially among social science students (Hastie, 2007). It is also critical to note the local culture of Alberta (the location of the university our

sample was drawn from). Despite the presence of the Alberta beef industry and reports indicating that Alberta has the highest red meat intake across all Canadian provinces (Statistics Canada, 2018), our study nonetheless demonstrated the effectiveness of an animal cruelty manipulation in shifting meat-eating intentions. Future research should examine how attitudes on meat consumption and factory farming may shift in differing cultural contexts.

Lastly, when discussing attitudes towards lowering meat consumption, environmental considerations should not be overlooked. Recent work by Herchenroeder et al (2022) suggests that environmental video appeals may be the most effective for increasing intentions to change future meat intake. A recent meta-review also echoed these sentiments (Grundy et al., 2022). Diving further into why some motivational factors may work better on a moral or personal level and who is most likely to be influenced by such factors would be a meaningful pursuit for future inquiries.

Conclusion

Research continues to stress the need to shift away from intensive farming practices and animal product consumption. In order to raise public concern and to catalyze action, we must understand how apathy or disengagement from these issues can be targeted most effectively. The present study contributes to a growing narrative suggesting zoonotic concerns do not evoke a response strong enough to broadly shift attitudes surrounding animal products and factory farming. Our findings instead offer support for the ability of informative paragraphs on animal cruelty to establish a desire to consume less meat and to support changes on factory farms. This research

432 should inform future endeavours seeking to spark support for behaviours and policies that
433 address the profound harm of factory farming and animal product consumption.

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Notes

1. Those who self-identified as pescatarian, vegetarian, or vegan ($N = 37$) were retained in the analyses.
2. A multivariate analysis of variance indicated that there was no significant difference between the zoonotic condition and the control in predicting meat consumption willingness, $M = -.25$, $SE = .19$, $p = .176$ or in predicting support for changing conditions on factory farms; $M = .12$, $SE = .14$, $p = .384$.

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723 **Table 1**724 *Descriptive Statistics & Intercorrelations Between Variables*

Measure	Mean	SD	1	2	3	4	5	6
1. Human Supremacy Beliefs	3.80	1.24	-					
2. Concern for Human Health/Welfare	6.03	0.95	-.08	-				
3. Concern for Animal Health/Welfare	5.18	1.30	-.45**	.49**	-			
4. Meat Consumption Willingness	3.80	1.64	.47**	-.18**	-.55**	-		
5. Support for Changing Conditions on Factory Farms	5.73	1.21	-.50**	.33**	.61**	-.62**	-	
6. Prior Awareness	4.55	1.35	-.14**	.22**	.25**	-.24**	.12*	-

725 *Note.* N= 454, Scale ranges 1-7, * p < .05, ** p < .01 (2-tailed).

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729 **Table 2**730 *Means and Standard Deviations by Condition*

	Mean	SD
Zoonotic Disease Condition n = 153		
Meat Consumption Willingness	3.89	1.59
Support for Changing Conditions on Factory Farms	5.63	1.22
Concern for Animal Health and Welfare	5.15	1.30
Concern for Human Health and Welfare	6.02	.89
Animal Cruelty Condition n = 151		
Meat Consumption Willingness	3.36	1.59
Support for Changing Conditions on Factory Farms	6.04	1.10
Concern for Animal Health and Welfare	5.43	1.22
Concern for Human Health and Welfare	6.14	.92
Control Condition n = 150		
Meat Consumption Willingness	4.14	1.66
Support for Changing Conditions on Factory Farms	5.52	1.24
Concern for Animal Health and Welfare	4.95	1.32
Concern for Human Health and Welfare	5.94	1.03

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Table 3*Multiple Regressions with Orthogonal Contrasts*

Model	$\beta(SE)$	[CI _{95%}]	Standardized Coefficients Beta	t	p
Meat Consumption Willingness Coefficients					
Constant	3.80(.07)	3.67/3.94		56.55	<.001
OC1	-.46(.14)	-.74/-.18	-.13	-3.24	.001
OC2	.40(.17)	.07/.72	.10	2.41	.016
HSB	.61(.05)	.50/.72	.46	11.23	<.001
OC1xHSB	.03(.12)	-.20/.26	.01	.25	.803
OC2xHSB	-.19(.13)	-.45/.07	-.06	-1.47	.143
Support for Changing Conditions on Factory Farms Coefficients					
Constant	5.50(.05)	5.40/5.60		109.18	<.001
OC1	.34(.11)	.13/.55	.13	3.17	.002
OC2	-.37(.12)	-.61/-.13	-.12	-3.02	.003
HSB	-.52(.04)	-.60/-.44	-.51	-12.79	<.001
OC1xHSB	.01(.09)	-.17/.18	.00	.07	.947
OC2xHSB	.04(.10)	-.15/.23	.02	.40	.690

Note. Constant= control condition; OC1= experimental contrast 1 (experimental compared to control); OC2= experimental contrast 2 (zoonotic compared to cruelty); HSB (Human Supremacy Beliefs; OC1xHSB= Moderation of HSB on OC1; OC2xHSB= Moderation of HSB on OC2.

739 **Table 4**740 *Mediation Analyses*

Mediator	Dependent Variable	Contrast	IV on Mediator <i>a</i>	Mediator on DV <i>b</i>	Direct Effect <i>c'</i>	Indirect Effect (ab) [CI _{95%}]
<i>b (SE b)</i>						
Concern for animal health and welfare	Meat	C1	.35*(.13)	-.67**(.05)	-.28*(.14)	-.23(.09) [-.40;-.06]
	Consumption	C2	.28(.15)	-.67**(.05)	-.34*(.16)	-.19(.10) [-.38;.01]
	Willingness					
	Support for	C1	.35*(.13)	.58**(.04)	.18(.10)	.20(.08) [.05; .35]
	Changing	C2	.28(.15)	.58**(.04)	.31**(.12)	.16(.09) [-.00; .33]
	Conditions on Factory Farms					
Concern for human health and welfare	Meat	C1	.13(.09)	-.28**(.08)	-.48(.16)	-.04(.03) [-.10; .01]
	Consumption	C2	.12(.11)	-.28**(.08)	-.49(.18)	-.03(.03) [-.10; .02]
	Willingness					
	Support for	C1	.13(.09)	.36**(.06)	.33**(.12)	.05(.04) [-.02; .14]
	Changing	C2	.12(.11)	.36**(.06)	.43**(.14)	.04(.04) [-.03; .13]
	Conditions on Factory Farms					

741 *Note.* *<.05 **<.01

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