

Animal Disenhancement in Moral Context

Korinn N. Murphy · William P. Kabasenche

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Abstract To mitigate animal suffering under industrial farming conditions, biotechnology companies are pursuing the development of genetically disenhanced animals. Recent advances in gene editing biotechnology have brought this to reality. In one of the first discussions of the ethics of disenhancement, Thompson argued that it is hard to find compelling reasons to oppose it. We offer an argument against disenhancement that draws upon parallels with human disenhancement, ecofeminism’s concern with the “logic of domination,” and

a relational ethic that seeks to preserve a meaningful relationship between farmers and their animals. In addition, we respond to two arguments in favor of animal disenhancement—one grounded in the non-identity problem and one that argues disenhancement is the best we can do to protect animal well-being right now. We argue that animal disenhancement does not address the fundamental issue of oppression of animals in the context of contemporary animal agriculture. Therefore, we conclude that animal disenhancement is not nearly as valuable as it might appear initially.

Korinn N. Murphy and William P. Kabasenche are co-first authors and have equal contribution to the conception and writing of the article.

K. N. Murphy
School of Molecular Biosciences, Washington State University,
PO Box 647520, Pullman, WA 99164-7520, USA
e-mail: korinn.murphy@wsu.edu

K. N. Murphy
NIH Protein Biotechnology Training Program, Washington State
University, PO Box 647520, Pullman, WA 99164-7520, USA

W. P. Kabasenche (✉)
School of Politics, Philosophy, and Public Affairs, College of Arts
and Sciences, Washington State University, PO Box 644880,
Pullman, WA 99164-4880, USA
e-mail: wkabasenche@wsu.edu

W. P. Kabasenche
Elson S. Floyd College of Medicine, Washington State University,
PO Box 644880, Pullman, WA 99164-4880, USA

W. P. Kabasenche
Center for Reproductive Biology, Washington State University,
PO Box 644880, Pullman, WA 99164-4880, USA

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Introduction

In 2016, representatives from a biotechnology company called Recombinetics published a letter to the editor of *Nature Biotechnology* reporting on their development through gene editing of dairy cattle that mature without horns [1]. Polling of cattle horns through cutting or burning is common in the dairy industry. The authors of the letter explicitly cited animal welfare as a motivation for their development. This is a recent example of what is being referred to in the ethics literature, following Paul Thompson, as animal disenhancement [2]. Thompson argues that it is hard to find compelling reasons to oppose disenhancement. We attempt to offer an opposing argument here.

We begin, as others have done, by looking at past instances of human disenchantment. In looking for parallels, we identify reasons why human disenchantment has been seen as ethically problematic. From there, we consider animal disenchantment through the lens of an ecofeminist perspective and argue that disenchanting animals exacerbates a “logic of domination” [3]. And this, we believe, will undermine the prospect of preserving any kind of meaningful relationships between farmers and their livestock. We argue that these relationships have value both for those raising animals and for the animals themselves. Clare Palmer has argued that the non-identity problem undermines a variety of claims about why disenchantment would be wrong [4]. We respond to her objection by offering a character-based account of the wrongness of some types of actions which would otherwise be permitted according to the non-identity problem. We conclude by addressing the objection that animal disenchantment might be the best we can do to preserve animal welfare in the current animal agricultural context. This objection and our response to it highlight our analysis of what the problem is that animal disenchantment might attempt to address and why, on our view, it fails to really do so. Ultimately, the reasons one might use to support a fairly modest form of disenchantment such as the hornless cattle created by Recombinetics also support far more aggressive forms of disenchantment. And those more aggressive attempts at disenchantment threaten to undermine the *entire culture* of animal agriculture.

Situating Our Discussion

Our aim in this paper is to examine the ethics of animal disenchantment. However, much of the discussion in the animal ethics literature engages with the question of whether the practice of consuming animals should be *abolished* altogether. Peter Singer and Tom Regan set this agenda early in the discussion about animal ethics [5, 6]. We do not take a position in this paper on abolitionism. We believe the question of whether disenchanting animals is ethically permissible or beneficial is important in its own right. Further, within ecofeminist ethics, care ethics, and virtue ethics—three ethical approaches we discuss and draw on below—there is not a consensus that using any of these approaches inevitably leads to the conclusion that abolitionism is the correct view. Many proponents of each of

these approaches certainly do care about whether we ought to abolish animal use and consumption. We remain open to that conclusion. However, the conceptual resources of these approaches do not lead inevitably to one particular conclusion on that issue. As examples, consider the work of Deane Curtin and Karen Warren. In “Toward an Ecological Ethic of Care,” Curtin discusses “contextual moral vegetarianism” [7]. He offers as examples a number of contexts in which he believes a hybrid ecofeminist care ethic should not endorse a universal opposition to meat consumption, such as the Ihalmiut people who live in the Arctic region [7, p. 70]. Similarly, Karen Warren, in *Ecofeminist Philosophy: A Western Perspective on What It Is and Why It Matters*, says, “Moral vegetarianism is not a universally required practice in all contexts” [3, p. 133]. Of course, one might think that vegetarianism is required in the predominant context of a modern, developed country in a climate that allows for a diverse plant agriculture. Ralph Acampora and Richard Twine both discuss objections to “contextual moral vegetarianism” [8, 9]. But again, this is not a settled debate, nor is it the focus of our paper.

Those who endorse abolitionism and who think that the question of ultimate importance is whether animals should be eaten or used at all can consider whether animal disenchantment is more or less likely to lead the world to a place where abolitionism becomes the predominant position. We suspect that disenchantment will make people less likely to move toward abolitionism. If so, for those inclined toward abolitionism, this is one more reason, on top of those we discuss below, to object to animal disenchantment.

There is a vast and growing literature on the ethics of human enhancement through biomedical means [10–12]. And Richard Twine points out that what little discussion there has been, until recently, of animal enhancement has been primarily for the benefit of humans [13]. However, Paul Thompson’s pathbreaking discussion of animals differs in two respects from this trend. First, as his title indicates (“The Opposite of Human Enhancement”), disenchantment does not seek to enhance capacities as much work in human enhancement has done [2]. Rather, it seeks to incapacitate animals. But, second, this is done, ostensibly, for the animals’ sake. Recombinetics, the company that has created genetically “polled” cattle touts their work as likely improving the welfare of animals. If so, then human enhancement and animal disenchantment are linked in the

sense that both projects aim to improve the well-being and experience of the recipient of the intervention. But as we argue below, even though animal disenchantment is alleged to benefit the animals created by it, we are not so sure it truly does. Rather, it might represent a form of oppressive domestication, whose primary aim is to promote human interests vis a vis the production and consumption of animals.

Human Disenchantment in Historical Context

Following Arianna Ferrari, we believe that instances of *human* disenchantment shed light on the ethics of animal disenchantment [14]. While they are now widely condemned as unethical, lobotomies were, for a time, a common form of treatment for patients with a variety of mental and behavioral disorders. Between 1936 and 1956, approximately 60,000 patients were treated using these surgeries in the USA. In 1949, the Nobel Prize in physiology or medicine was awarded to the neurologists who developed the prefrontal lobotomy [15]. But these procedures had horrible outcomes for patients as a result of the loss of brain function caused by the surgeries. Some patients underwent permanent personality changes, others lost the ability to function independently, and the most severe cases resulted in patients in a mostly nonresponsive “vegetable-like” state. The prefrontal lobotomy was used to treat patients by effectively reducing their cognitive and affective capacities. In short, the technique disenchanted patients, ostensibly in order to reduce their immediate experience of suffering. In this respect, it is very much like some proposed forms of animal disenchantment.

But lobotomies are now widely condemned. For the most part, they are viewed as a medical intervention whose “benefits” to the patient came at far too high a price. Peter Breggin argues that lobotomies are unethical because they lack informed consent and they infringe on the personal freedom for those who receive them [16]. Thus, his opposition is grounded in the failure to respect the autonomy of individuals who are lobotomized. However, an individual whose mental state was impaired enough to warrant consideration for a lobotomy would likely lack a capacity for autonomous action, particularly the capacity to give meaningful consent to such a procedure. It is not clear, then, that this explains widespread opposition to lobotomies.

Like animal disenchantments of various kinds, lobotomies represent an attempt to modify an individual to make their existence better for them. On those terms, it seems difficult to say why this would be wrong if we focus exclusively on alleged harm experienced by the individual. We might concede that in *some* cases, it is better for the individual lobotomized—better for them in terms of their own direct experience, perhaps by removing agitation and other forms of emotional distress. But doing so would require that we are confident there are not any other better options available for such individuals. An intervention that is costly to the recipient in terms of other capacities lost cannot be justified unless those costs are outweighed by a greater benefit. Lobotomies are very costly to the recipient, so even if we thought they could be justified on some occasions, this would only be after we have made every attempt to provide treatment or relief in any other, less incapacitating way. A lobotomy costs the patient a lot in terms of capacities for experience. Where those experiences are negative, this might be considered a good outcome. However, a lobotomized patient’s frontal cortex also provides the capacity for a great many positive experiences and the capacity for these is lost as well.

A proponent of lobotomies might press the claim that the overall benefits of the procedure outweigh the overall costs. Again, we acknowledge that this might sometimes be the case. Although, as we discuss below, in the history of lobotomies, it is not at all clear that proponents of the procedure took seriously their need to establish the case that the benefits outweighed the risks for a patient. Nor did proponents seem to grapple with the possible objection that such a form of mutilation is wrong for rights-based or deontological reasons, even if it had the possibility of creating a “net positive” experience for the recipient. Lobotomies are dehumanizing in that they take away capacities we think of as characteristic of human beings. Indeed, sometimes, lobotomized patients are referred to as “vegetables”—an indication of their dehumanizing effect.

In the historical context of the use of lobotomies in the middle of the twentieth century, it is pretty clear that these interventions sometimes served other interests besides those of the patient. At its worst, the lobotomy represents an extreme measure to “domesticate” a patient. And during an era when institutionalization was already the most common response to mental illness, the lobotomy begins to look like simply a more aggressive tool for domestication. An ecofeminist perspective,

which we discuss further below, would predict that if lobotomies are a form of human domestication, then the parties in power would likely be primarily men and the targets of this technique would likely be primarily women. And indeed, this is just what we see historically. Just as women's bodies underwent domestication in the realm of pregnancy and childbirth [17], mentally ill women were disproportionately targeted for psychosurgery. Despite men outnumbering women in state hospital systems, 60% of lobotomized patients were women. Of 20 initial psychosurgery patients chosen by Dr. Walter Freeman, the physician who brought the lobotomy to the USA, 17 were women. Psychiatrists believed women could more easily return to a domestic life than men to a career post-operation [18]. In short, it was believed that women were more suited to being “domesticated” by the operation.

The parallels here with animal disenchantment are clear. It, too, represents a more aggressive form of domestication, particularly when placed in the wider context of current animal agricultural practices. And it, too, serves a number of interests other than those of the animals themselves. And like the lobotomy, whose categories of use expanded until it garnered enough backlash to earn it wide condemnation, first steps in animal disenchantment also seem likely to open the door to increasingly severe forms of incapacitation. And animal disenchantment hardly represents our last, best option for improving animal well-being.

Another widely discussed case of human disenchantment is that of Ashley X—the “pillow angel.” Ashley is a severely developmentally impaired young woman who, in 2004, began to show signs of precocious puberty at about age 7. Her parents requested a number of surgical (e.g., hysterectomy and removal of breast buds) and hormonal interventions (e.g., estrogen therapy) to permanently prevent the onset of puberty and sexual maturity and to keep her body weight low enough to allow her to be easily moved by caregivers and to reduce Ashley's own discomfort. While these interventions (which actually became known as the “Ashley treatment”) remain quite controversial, they did have some vocal defenders [19, 20]. At the very least, the polarized response to Ashley's treatment demonstrates a level of discomfort in making physical disenchantment a routine response to suffering. This case might be used to justify further incapacitating interventions. It raises the question of whether the “treatment” actually does guarantee a reduction in

suffering. And it raises the question, as with lobotomies, of whether the benefits to Ashley are outweighed by the deficits she might suffer due to imposed incapacity.

These ethical issues are, again, closely connected to the case of animal disenchantment. We should be asking the same sorts of questions about those procedures as well. Animal disenchantment also seems poised to begin with modest interventions and quickly move to more radical ones. The “animal microcephalic lumps” (AMLs—see below) discussed in Schultz-Bergin represent the far end of a spectrum of disenchantments [21]. And they might be indicative of how far we need to go to guarantee the elimination of animal suffering, given our resistance to other forms of fundamental change in animal agriculture. Some, such as Shriver, argue that animal disenchantment represents a “second-best” option in a less than ideal world [22]. Defenders of the Ashley treatment made similar claims. While in Ashley's case there may well be real questions about whether we can wait on society to change while she lives with her impairments, this is less open to question in the case of animal disenchantment. In the latter case, we are talking about a planned intervention to be used on a large, industrial scale (whereas even defenders of the Ashley treatment recognize it should be used very, very rarely).

If the starting point for justifying disenchantment is the reduction of animal suffering, there are many ways we could achieve that. Any number of improvements to animal agriculture could achieve a reduction of suffering for animals. One example would be the work of Temple Grandin, who has advocated for curved loading chutes to reduce the stress and panic cattle exhibit when they can see other cattle being slaughtered ahead of them. She realized that since cattle have wide angle vision, simple interventions like solid walls and curved chutes substantially reduce their stress. Grandin's interventions aimed to reduce suffering by changing the system itself, as opposed to a disenchantment-oriented approach which would focus intervention on the animal's capacity for wide-angle vision. Grandin views her advocacy as directly tied to her ability to empathize with animals and the value she places on their unique sentience and experience of their surroundings [23]. It is hard to argue that the only option available to us is to modify animal bodies when changes to an animal's environment have also been shown to reduce animal suffering. And this of course raises the question of whether the changes being proposed in animal disenchantment are truly for the

sake of the animals, or whether they represent an attempt *not* to change most of the other features of the system.

We acknowledge that Temple Grandin’s work is controversial to factory farming abolitionists, many of whom believe that incremental welfare improvements simply normalize animal slaughter. From our perspective, it seems that normalizing animal disenchantment is also likely to maintain our current agriculture system. For those who situate animal disenchantment as a “second-best” option, questions regarding the moral difference between interventions aimed at animal’s bodies and those directed at an animal’s environment still need to be answered. Richard Twine emphasizes that these interventions will not always be morally equivalent. While they may ultimately strive toward the same goal of reducing animal suffering, we offer ethical considerations in favor of environmental changes below. One concern raised by Twine is the tendency for molecular interventions to increase the “threshold of control” humans hold over other species [13]. This seems particularly relevant to disenchantment in industrial agriculture, where animals are already largely treated as production units. We return to this conflict between healthy relationships and control in our discussion of farmer-animal relationships.

Here, one might object that there ought not to be an automatic preference for changing environments rather than changing the animals themselves. But as our discussion of lobotomies and the Ashley treatment attempts to show, there are indeed reasons to be concerned about changing bodies in the direction of incapacitation. For one, this undermines the integrity of the organism. With lobotomies of human beings, we might call this “dehumanizing.” Something similar occurs when an animal is altered so as to take away their capacity for experiencing their world and for having any kind of meaningful relationship with conspecifics or with humans. Below, we argue that there is value in preserving the possibility of some kind of meaningful relationships between agricultural animals and the human beings who are most directly involved in their rearing.

Disenchantment Utilizes a “Logic of Domination”

We acknowledge there are some laudable motivations for doing animal disenchantment, particularly with respect to reducing animal suffering. However, we are concerned that justifications for animal disenchantment

share some similarities with other forms of social oppression. For example, there is a wide breadth of ecofeminist scholarship that has analyzed the interconnection between the exploitation of women and nonhuman animals. Ecofeminists claim the logic used to justify the domination of animals often reinforces and parallels the logic used to oppress women. Historically, ecofeminists have worked to create a non-hierarchical and contextualized ethic that calls attention to the “othering” of women and nonhuman animals [24].

Applying an ecofeminist lens to the issue of animal disenchantment requires us to think about the power dynamics and full social/economic context under which disenchantment would occur. As we demonstrated above, the historic misuse and controversy of *human* disenchantment have been primarily centered on women’s bodies. If we consider oppression to be an “enclosing structure” of systematic abuse and exploitation, then the oppression of animals in our current agricultural system certainly mirrors the oppression of women [25].

Karen Warren argues that the common oppressive framework applied to women and nonhuman animals in society exhibits three basic principles: (a) value hierarchies, (b) value dualisms, and (c) a principle of domination [3]. In our view, each of these principles is evident in the logic of disenchantment. First, it is clear that we assign value hierarchies in how we perceive and experience empathy for animals. In the USA, farm animals currently fall outside the protection of many anti-cruelty laws including the federal Animal Welfare Act [26]. In addition to discrepancies in legal protection, socially, we assign value to animals based on our preferred use or relationship with them (farm animals, research animals, animals we own as pets).

In addition, it is well-defined by ecofeminists that women and nonhuman animals occupy the same undervalued side of a problematic value dualism. In a patriarchal culture, the natural/physical realm is assigned less overall value than the mental realm associated with men. Situating women and nonhuman animals in the physical realm places them lower in the hierarchy of value assigned to the physical/mental value dualism. As discussed by Carol Adams, this positioning of women and nonhuman animals as inferior occurs in a mutually reinforcing manner [27]. Linguistically, women are often “animalized” and animals are “feminized” when those in power justify their exploitation (e.g., describing women in pejorative animal terms such as dogs, chicks, old hens).

Furthermore, a principle of domination appears to be present in the logic of disenchantment. Warren identifies this principle as the assumption that superiority (i.e., moral or otherwise) justifies the subordination of those deemed inferior. We are concerned that disenchantment is a domination-oriented solution to animal suffering. In so far as it functions as a tool of enhanced animal domestication, disenchantment can be understood to dominate animals. It seems that if we truly valued the capacities of animals, we would try and improve an animal's experience, rather than eliminate the animal's capacity for experience altogether. Certainly, when it comes to humans, we do not address suffering by discarding our capacity to feel or experience the world; rather, we seek to identify and change the harmful conditions that have caused the suffering to occur.

While an increased concern for suffering may seem like a positive, feminists have shown that actions which may appear benevolent can actually be harmful when properly contextualized in an oppressive framework. Feminists support this claim by pointing to examples of "benevolent sexism." Some actions may seem intended to help, such as those that arise from the belief that it is men's responsibility to take care of women (e.g., always paying the bill) but become more insidious when we look at the action in the context of a systemic oppressive ideology (perhaps that women are and should be economically dependent on men). For this reason, feminists encourage us to look macroscopically, rather than at single actions, in order to recognize oppression. While animal disenchantment may appear benevolent, looking macroscopically at animal treatment and industrial agriculture, it is clear that disenchanting animals could operate to keep animals trapped within an oppressive system, much like benevolent sexism keeps women trapped in oppressed roles.

Ultimately, it is unclear whether animal disenchantment could ever be implemented outside of an oppressive framework. Viewing the capacities of animals as disposable is concerning, in part because of the strong connection between the oppression of animals and the oppression of women. Indeed, in the historic misuse of the lobotomy, the targeting of mentally ill women suggests disenchantment is more likely to be used on those whose capacities are valued less to begin with. Many ecofeminists view "contextual moral vegetarianism" as the logical endpoint of a feminist approach to animal advocacy [3, 7]. From our perspective, a shift toward disenchantment in industrial agriculture would most likely decrease the

number of people willing to adopt a vegetarian diet, as perceptions of animal suffering decline, and the perceived permissibility of consuming animals for food increases.

The Extent of Disenchantment

Proponents of animal disenchantment will likely want to press the basic claim that disenchantment constitutes a benefit for the animal who receives it because the animal's immediate experiential well-being will be improved. However, this claim requires examination. In an article on breeding for behavioral change, D'Eath et al. offer some examples that should give us pause [28]. They note that scientists will often need proxy measures to assess when they have successfully introduced a genetic change. One example they discuss is "flight speed from a crush in beef cattle" as a proxy for calm animals [28, p. 20]. But they note that animals might be slow for reasons unrelated to a calm disposition or that the response measured might not successfully generalize to other situations where animal well-being is at stake. They also discuss pigs bred without tails which would otherwise be a target for biting by other conspecifics [28, p. 22]. But then point out that genetically induced tail docking helps the pig bitten while leaving untouched the instinct to bite. A more suitable environment for pigs with these instincts would provide space and appropriate substrates for rooting and chewing. These two examples suggest that modest disenchantments like genetically selected "calmness" or genetically induced tail docking do not really address fundamental well-being issues for the animals in question. Even worse would be "stoic" animals who still feel frustration, anxiety, or pain, but do not indicate by their behavior that this is so [28, p. 23]. This could easily be perceived by humans who lack direct access to the animals' experience as an improvement when in fact it is not an improvement in the animals' experiential well-being. This suggests that disenchantments which truly do address well-being might have to be quite aggressive. D'Eath et al. mention "zombie" animals that are generally unreactive to environment, although even here we would need to be concerned that what we think is a "zombie" animal is actually a "stoic" animal.

A better example of where disenchantment might truly need to go to successfully address concerns about animal well-being would be the "animal microcephalic lumps" (AMLs) mentioned earlier. We could be

reasonably confident that AMLs, lacking frontal cortexes and other neurological components necessary for any kind of experience, would not have negative experiences and suffer deficits of well-being as a result. But this is a very aggressive sort of modification. And it destroys the possibility of any kind of meaningful relationship between farmers and their animals. We see this as a reason to favor modifications to the environment in an effort to improve animal well-being as opposed, as a general rule, to modifications of the animals themselves through disenchantment. Environmental changes can be made with the aim of preserving some level of farmer-animal relationship. Animal disenchantment, if we are honest about what we will need to do to truly address well-being, seems likely to undermine such relationships. Another reason to favor environmental changes over genetic ones is that the latter are permanent and irreversible. This would be a concern if, as has happened previously in genetic modification, we discovered off-target effects that cause harm to the animal.

Preserving Human-Animal Relationships in Agriculture

As a society, we are at a fork in the road concerning our treatment of farm animals. The end of one path is complete disconnection between humans and animals in agriculture. This path values animals solely as production units and erodes opportunities for meaningful connection between humans and the animals they raise. The other path favors the preservation of meaningful human-animal relationships and interactions. In short, either we reject any reasons not to go “all in” on the disconnection created by industrial agriculture or we decide that while industrial agriculture may not be ideally conducive to meaningful relationships, we at least do not want to create scenarios where it is any *harder* for these types of relationships to form. We see disenchantment as an obstacle toward relationship between farmer and animal. As disenchanted animals become increasingly more incapacitated and less aware of the environment around them, the potential for meaningful interaction diminishes. We view the creation of extremely incapacitated animals as the logical end to disenchantment, since it is the only option that will ultimately guarantee no suffering in an industrial agricultural setting. We argue that for the sake of humans

and animals, we should preserve agricultural contexts in which human-animal relationship is possible.

We should focus on the impact animal disenchantment might have on farmers. Indeed, if we are going to pursue the development of disenchanted animals, we should take the time to ask what effects such an endeavor could have on the people whose livelihood involves raising and interacting with farm animals. Farming is an important occupation; in 2012, there were an estimated 2.1 million principal farm operators employed in the USA [29]. Farming has long been recognized as a stressful occupation. In 2016, the CDC released its findings that agricultural workers (including farmers, farm laborers, ranchers) take their lives at a higher rate than any other occupation [30]. Therefore, it is particularly important that we consider the well-being of farmers when making decisions that may impact their job satisfaction. Many farmers report meaningful relationships with their animals as one benefit and rewarding aspect of farming. The feelings of alienation that can arise when this relationship is compromised, such as within an industrial agriculture setting, are harmful to the human spirit. In industrial agriculture, farmers have already begun to lose the connection between the process of raising and caring for an animal and eventually slaughtering that animal for food. Disenchantment could further alienate a farmer from the process of raising animals for food, by creating disconnection and less overall satisfaction with the activity of labor [31].

We believe actions which seek to preserve, rather than weaken, the potential for meaningful human-animal relationships in agriculture can enhance the well-being of farmers and the animals they raise. Research has shown that farmers who are more invested in relationships with their animals are more likely to raise animals with higher welfare and productivity. One study attempting to correlate human attitudes to animal productivity and welfare found that milk yield in cows was related to higher levels of human empathy and job satisfaction [32]. Those people who scored as more agreeable and conscientious on the personality questionnaire were found to have less negative beliefs about cows (such as cows are dirty, cows are hard to handle, cows are unable to feel happiness). The authors of this study proposed that increased welfare and productivity may be a result of the increased satisfaction agreeable/conscientious people gain from time and effort invested in their livestock, as well as an increased willingness to

empathize and try and understand their cows. Importantly, higher levels of negative attitudes also correlated to lower milk yields. Other studies support this correlation between human attitudes and behaviors and animal productivity and welfare [33, 34]. It is reasonable to assume disenchantment could contribute to negative beliefs about livestock animals, potentially decreasing farmer's willingness to invest in a caring relationship and thereby compromising the animal's welfare or productivity.

Fundamentally, we argue that we should be wary of creating contexts in which we do not have to care. Indeed, a feminist ethic of care holds that cultivating the ability to care for others is central to moral action. This ethical theory was founded by the pioneering work of Carol Gilligan and Nel Noddings starting in the mid-1980s [35, 36]. It attributes moral significance to relationships, caregiving activities, and empathy-based responses. Ruth Groenhout identifies relationships of care as a critical component of human flourishing and a deeply ingrained part of our psychology. In addition, she believes we should analyze the ways in which social structures support or fail to support caring relationships [37].

An ethic of care recognizes the benefit of maintaining conditions where relationships can flourish, and imagines that healthy relationships with animals can stimulate the empathy necessary for successful social morality among humans [38, 39]. Lori Gruen believes that an ethic of care will be central to understanding and improving our relationships with animals. She uses the term “entangled empathy” to highlight that we are in relation with animals, and therefore responsible for responding to animal's needs [40]. We acknowledge that not every farmer will have a personally meaningful relationship or connection to their animals, and that caring relationships are unlikely to live up to their full potential in an inherently oppressive agriculture system. Many care ethicists, including Lori Gruen, are quick to point out that relationships of exploitation are the sorts of relationships that need to change, ideally by working to make relationships more meaningful and mutually satisfying. Is disenchantment a step in that direction? We believe that disenchantment is counterproductive to that goal. It seems clear to us that at least *maintaining* the possibility for human-animal relationship is more likely to result in care, and the motivation to abolish factory farming, than going all in on animal disenchantment.

Care ethicists have focused on debunking the “myth of the autonomous individual.” Fundamental to an ethic of care is a recognition that humans are inherently interdependent, making us inevitably in relation with one another, as well as reliant on care and caring relations [41]. Animal advocates have used this framework to highlight interdependent relationships between humans and nonhuman animals. Since domesticated animals are often in positions of dependency, much discussion in care ethics has centered on how to acknowledge our responsibilities to animals without paternalism. We have previously discussed Richard Twine's idea that genetic interventions can increase the “threshold of control” humans hold over other animals [13]. With an ethic-of-care framework in mind, it seems to us that an important distinction exists between the desire to exert control over those who we are in relation with and the desire to recognize and respond in a thoughtful manner to relationships of dependency. While there will always be some measure of control in any relationship with a domesticated animal, we believe that controlling outlooks or behaviors can negatively impact the capacity to recognize and prioritize another's needs and interests. Many types of dependent relationships (e.g., parent-child, teacher-student) are more fulfilling when the caregiver is responding to the unique needs of the cared for rather than merely imposing their own set of needs or desires. For many relationships, a motivation of control can quickly become abusive or exploitative. Disenchantment in many ways is eradicating rather than responding to an animal's needs. It also seems poised to increase human control over animals. Suffice to say, disenchantment does not seem to embody the type of motivations most conducive to ethical care. We believe that genetic modifications that increase the control humans have over animals are in conflict with the aim of promoting or aiming at meaningful relationships between humans and animals. One need not romanticize farmer-animal relationships in contemporary agriculture to recognize that increasing the threshold of control over an animal through genetic modification sets a trajectory that moves away from the sort of relationships that will motivate and exemplify care for animals.

If we acknowledge that our relationships with animals can broaden our capacity for care, we must reject disenchantment for the harm it poses not just to animals, but to successful human relationships. We cannot expect farmers to be as fulfilled or their animals to reach the

same standard of welfare if we compromise the ability for a satisfying human-animal relationship. Therefore, for the sake of human and animal well-being, we should reject animal disenchantment and avoid committing ourselves to a path of animal agriculture devoid of care.

The Non-identity Problem in Animal Disenchantment

One objection to our view, and to any view that opposes animal disenchantment, is rooted in the non-identity problem [4]. The genetic modifications that create the disenchantment are also conditions of the very existence of animals with those particular disenchantments. Thus, those particular animals could not exist any other way. And so long as their existence is not worse than death, it is hard to see how existence with an identity-constituting disenchantment is a bad thing for *that* particular animal. On this view, no one could oppose the existence of such animals because those particular animals could not exist another way. There is not another, better option *for them*.

While some forms of animal disenchantment might seem extreme enough to qualify as being worse than death, even this is not certain. Animal microcephalic lumps (AMLs) represent probably the most advanced proposed attempt at instrumentalization of animals for food production purposes [21]. But for those “individuals,” their lack of awareness of their own stunted existence seems to justify their creation. It cannot be wrong *for them* because they cannot experience such an existence as a harm. Indeed, they cannot experience anything.

But even less extensively modified animals would still seem to be justified on the claim that they are not harmed by their creation, if their unique existence is the result of those modifications. A different animal might not have such modifications, but because the two are not two different versions of one existence but two different individuals, they cannot really be compared. Life for the disenchanted animal cannot be made better with respect to those features that make that animal what it is and not some other animal.

Palmer discusses a way to oppose these implications with an argument that a state of affairs can be worse than another even if we cannot identify the individuals for whom it is worse. However, it is not at all clear how we can make sense of something being a harm, if we cannot

identify someone for whom it is harmful. Impersonal harms are vacuous [42]. Who is worse off in a world with disenchanted animals? Not the animals themselves. They would not exist were it not for the genetic modifications that led to their very existence. Unless their existence is worse than non-existence, we cannot say that they, as individual animals, suffer a harm. And if they do not, then in what sense could we say that this is a worse state of affairs? We can imagine better worlds with less suffering, but not *for them*.

While Palmer represents one type of response to the non-identity problem that attempts to show how we can still say that harm is caused, there are other options for responding. Some actions are wrong, even if they do not harm any identifiable individual. One way to support this claim would be to shift the focus from the allegedly harmed individual to the moral agent engaged in actions we might be pre-reflectively inclined to call wrong or harmful [43]. On this view, the motivations of the agent would be subject to evaluation as well as the relationship between humans (or some of them) and the animals they raise for food production. Both Thompson and Palmer consider and reject a character-based approach to the non-identity problem and its implications for animal disenchantment [2, 4]. Palmer says, “it’s hard to get a grip on why we should think [there is a problem with the moral character of those who would engage in disenchantment]” [4, p. 47]. One important feature of moral character is the motivations from which one acts.

If animal disenchantment were done out of a motivation that we could characterize as primarily good in nature, we would have reason to think it is a good act. And indeed, it is easy to imagine some having just such a motivation. However, in the context of contemporary animal agriculture, other, less noble motivations seem close at hand as well. If the aim of animal disenchantment were merely to reduce our sense of guilt about the suffering animals experience, but with no further commitment to improving the experiences of animals in agricultural settings, this motivation seems suspect.

Have we exhausted other options for improving animal well-being? In its historical context, it seems that there has been a trend in animal agriculture toward increasing production quantity and efficiency, often at the expense of animal well-being. If this is true, then the motivation to improve animal well-being is conditioned by other motivations, such as to maintain current production levels and to minimize costs in producing at

those levels. A motivation that says: “we want to improve the experience of these animals, but only if we can do so without sacrificing production and efficiency” is not a purely altruistic motivation. Must our motivations be purely altruistic? That is surely too high a standard for many circumstances. A more modest standard might simply ask if we can demonstrate a reasonable amount of consistency across contexts in displaying a motive. Even by this standard, contemporary animal agriculture seems suspect, primarily because there appear to be many more things that could be done to improve animal well-being than are being done. Indeed, in the larger historical context of the relationship between humans and animals, we might even see contemporary animal agriculture as a movement away from serious concern for animal well-being, even if there have been some recent corrections toward a higher level of well-being. Adam Shriver concedes that his support for animal disenchantment is, at least in part, because of his lack of optimism that the contemporary animal agricultural industry will do anything significant to otherwise improve animal well-being any time soon [22]. The non-identity problem precludes saying that the animals who result from the genetic modifications are harmed in the sense of being made worse off than they otherwise might have been. However, we can still say that the motivations that support a meaningful relationship between farmers and animals are in conflict with disenchantment.

In the previous section, we described some features of the character of a farmer who remains capable of having a meaningful relationship with his or her agricultural animals. Indeed, one feature of the virtue of care is precisely a desire to have a meaningful relationship with others for whom one cares. Given that animal disenchantment will make that less possible, on the assumption that ameliorating a capacity for suffering will also negatively affect a capacity for experience and relationship, a person who embodies the virtue of care for her animals would be opposed to such interventions precisely because of how they would impact the possibility of a meaningful relationship.

Concluding Thoughts

The impetus to consider doing animal disenchantment in an agricultural context starts from an alleged concern to mitigate the experience of suffering. On the face of it, this

is a laudable motivation. But we argue that the logic of this justification for genetically modifying animals does not have a clear stopping point. There is no reason to think it would or should, given that justification, be restricted to modest, minor changes to animals’ capacities. Thus, we are skeptical of even starting down that path.

But we can imagine the following sort of objection, possibly from Adam Shriver who has argued for seeing animal disenchantment as the best we might be able to do under the current cultural and practical circumstances [22]. The prospect of significantly changing the animal agriculture system in the near term is dim. Given this, the objection goes, we should be thinking in terms of a “theory of second best,” of what is feasible in the near term. And one of the constraints on feasibility for now is the continuing desire for large amounts of inexpensive meat and other animal agricultural products. Given this constraint, and the unlikelihood of wholesale changes to the system that delivers these products, maybe animal disenchantment is the best option for minimizing the experiential cost to animals. So, perhaps we should not be so critical of disenchantment. So the objection might go.

This objection starts with the concession that something is wrong with the current animal agricultural system. While not everyone agrees with that, the impetus to do animal disenchantment does seem to be linked to that concession. Animals currently suffer, and disenchantment might be a way to relieve that suffering. Perhaps animal disenchantment is a near-term solution before longer-term solutions can be enacted. Is animal disenchantment a step in the direction of making systemic changes? This might depend on what we see the ultimate problem of the “the system” to be. For those who think only in terms of the immediate, experiential suffering of the animals, disenchantment is not a temporary measure at all. Rather, on this view, we should follow the route of disenchantment until we can be confident we have created animals with no experiential suffering. And this, we argue, will lead us to something like “animal microcephalic lumps” (at least until synthetic meat becomes a comparable product). AMLs have no capacity for experience, and therefore no capacity for suffering. We argue that for those who think immediate, experiential suffering is the root problem, there is no reason to stop disenchanting until we can be confident that we have created animals with no capacity to suffer. For some, this will be an acceptable conclusion and outcome. However, we see the fundamental problem differently, and we are uncertain that we should embrace

AMs as the future of ethical meat production, recognizing, of course, that for some abolition of meat production is the only ethical outcome.

If immediate, experiential suffering is not the root problem, then what is? Another possibility is that our current animal agricultural system fundamentally oppresses animals and that this harms both the animals and those in close relationship with the animals by disrupting the prospect of meaningful relationship. On this view, animal suffering is a by-product (albeit a serious one for the animals who suffer) of the oppressive conditions in which they live and die. Does animal disenchantment address this problem? While it does address the by-product, it does not appear to address the oppression at all. Arguably, disenchantment creates the possibility of even more oppressive conditions. In our analysis above, the loss of meaningful relationship between farmer and animal is a significant sign of this oppression. Animal disenchantment will only make *that* problem worse.

Thus, we see two possible outcomes to deliberation about whether to engage in animal disenchantment. Either, we diagnose the immediate, experiential suffering of the animals as the root problem, in which case we have reason to take animal disenchantment to its logical end—animals with no capacity for experience or suffering. Or, we diagnose the larger oppressive conditions in which modern animal agriculture occurs as the root problem, in which case disenchantment either, at best, does nothing to address the root problem, or, at worst, might make us complacent about the larger context of oppression, because we have mitigated the immediate suffering of agricultural animals and might be tempted to think that this is all there is to the problem. On this account, animal disenchantment does not look like a valuable step in the direction of addressing the root problem of oppression.

Thus, whether animal disenchantment is seen as a solution to an immediate problem (of experiential suffering) or as a temporary measure en route to addressing the deeper issues of oppression, it does not appear to us to be nearly as valuable as its proponents might believe it is.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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