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Meat and Health

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FROM THE EDITOR

Meat and Health

Elena Diller

The earth provides enough to satisfy every man's need but not every man's greed.
Mahatma Gandhi[1]

When we're dead and buried, our bones will keep hurting.
Ignacio Davalos[2]

Human health is inextricably related to our surrounding environment—the air we breathe, the water we drink, the soil in which we grow our food. Practitioners, philosophers, and professional health associations have long recognized this connection. For example, American Medical Association House Policy H-135.938, "Global Climate Change and Human Health," tasks physicians with the responsibility "to assist in educating patients and the public on environmentally sustainable practices."[3] So, what should be done by stewards of health, such as clinicians and public health officials, when humans threaten the world upon which they rely?

Meat processing and consumption is at an all-time worldwide high due to an increase in both average per-person consumption and number of consumers, particularly within middle-income countries.[4,5] This demand is being met by an oligarchy of meatpacking companies composing the global meat sector that were collectively worth 1.3 trillion USD in 2021 and are projected to be worth 1.6 trillion USD by 2027.[6] Meat consumption, particularly red and processed meat, is linked to negative health outcomes, including increased total mortality, coronary artery disease, and colorectal cancer.[7] Yet the industry's practices have wider implications for efforts to promote human health that must be considered.

There is a human, animal, and environmental cost to raising, slaughtering, and processing over 100 billion animals worldwide annually.[5] Livestock, slaughterhouse, and meat processing workers "have some of the highest rates of occupational injury and illness" in the United States and are often under duress while working.[2] Animal agriculture contaminates fresh water and soil sources with pollutants, such as livestock waste.[4] It also contributes to deforestation, as 63% of clearing in the Brazilian Amazon is due to cattle ranching.[8] Moreover, the sector produces almost 15% of total greenhouse emissions,[4] which contribute to extreme weather conditions and subsequent food safety and distribution issues,[9] as well as respiratory diseases from smog and air pollution.[9,10]

We, as stewards of health, have responsibilities to help ourselves, our patients, and our communities. This issue of the *AMA Journal of Ethics* seeks to educate readers on how meat is processed and consumed and on the resulting health consequences for humans, animals, and the environment. In doing so, the collected papers question how health professionals can and should respond to the challenges that meat consumption creates both within clinical practice and at an institutional level. These articles are brought to you by a diverse array of contributors who share their expertise and unique perspectives on how meat is shaping our health. We thank them—and you, the reader—for exploring how the meat on our plates transcends our bodies.

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CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

Which Concerns Deserve Consideration in Dietary Counseling of Patients Earning Low Incomes?

Laura Williamson, PhD and Lee Merchen, MD

Abstract

This commentary on a case considers when physicians offering health advice on diet has potential to undermine trust. If physicians fail to model behaviors for which they advocate, they could be targeted by media or have disputes with colleagues, which could further undermine trust. To better manage professional obligations to both individual patients and the public, this article proposes prioritizing interprofessional, community-engaged approaches to advocacy.

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Case

At an American Academy of Family Physicians (AAFP) conference, Dr M learned about the AAFP's environmental health initiatives and attended a presentation about meat's contributions to pollution, greenhouse gas emissions, and climate change and the importance of physicians' clinical and public health roles in counseling patients to reduce industrial meat production and consumption.

One of Dr M's patients is JT, who washes dishes in a local restaurant known for its "cheap and delicious" barbeque. JT eats there regularly since a meal is free with each shift. Dr M, who eats animal protein only when it's locally sourced and organic, wonders about the nature and scope of their responsibility as a health professional to promote environmental health patient education through dietary counseling to JT, whose cardiovascular risk is currently low.

Commentary

Calls for physicians to act as health advocates—as individuals or as part of an organization—are ubiquitous in professional guidance and literature.[1,2,3,4] As the present case notes, while physicians have traditionally been expected to advocate for their patients, they are increasingly tasked with broader social responsibilities. The American Medical Association (AMA) has declared that physicians have a duty to "educate the public and polity about present and future threats to the health of humanity."[1] Physicians' advice on health that encompasses individual and public health has the

potential to be conflicting, although physicians' advocacy in the public interest cannot supersede their guidance and care of each individual patient. In this commentary, we point to the importance of promoting physician advocacy in a manner that maintains the sanctity of individual care and relationships.

Counseling patients with low income, such as JT, to make dietary changes—primarily to protect the environment—raises a range of issues: (1) whether people have different degrees of responsibility to support public interests based on their personal circumstances, (2) how the personal responsibilities of physicians are affected by their giving general health advice to the public, and (3) how physicians' awareness of the wider culture of advocacy and mobilizing a wide range of expertise can support their efforts to advocate for complex public and private issues. Before addressing these topics, we will examine the importance of ensuring that advocacy on social issues does not undermine the trust that people place in physicians.

Advocacy and Trust

Physician advocacy seeks to capitalize on the trust that individual patients place in their doctor to support the medical profession's efforts to address health challenges that extend from the clinic to society. This rationale depends, in part, on research showing that physicians' competence significantly contributes to their being seen as trustworthy.[5] But it is important to recall that patients' trust is also based on their believing that their particular or best interests are at the heart of physician practice.[6,7] It is a matter of concern that physicians may engage in public health or social advocacy by offering general health advice without considering the specific challenges that individuals might encounter in following that guidance. Such advocacy has the potential to undermine trust in physicians if people perceive physicians as not acting in their interests.

Foundational to the current case is evidence that intensive animal agriculture fuels climate change and so threatens human health.[8] A number of professional medical associations have pointed to the responsibilities that physicians have in helping to respond to the climate crisis.[9,10] The AMA specifies that physicians have a responsibility for "educating patients and the public on environmentally sustainable practices, and to serve as role models for promoting environmental sustainability."[9] The trusted status of physicians as skilled, competent advisors regarding complex health information makes their involvement in such contemporary challenges unsurprising, even desirable. But essential to any expanded public role for physicians are strategies and education to help them navigate issues that might negatively impact the trust placed in them. We now turn to examine some of these issues.

Assessing Capacities and Responsibilities

Physicians' providing only utilitarian advice to reduce meat consumption risks overlooking the complex range of factors that influence individual health-related behaviors.[11] Specifically, counseling behavior change without consideration of how factors like culture, race, and socioeconomic status affect peoples' established preferences and receptiveness to advice could make advocacy efforts appear irrelevant or "out of touch" for parts of the intended audience, including their own patients.[12] As a result, physicians must find ways for public advocacy to accord their focus on individual patient needs and preferences in order to maintain their trustworthy status. Failure to strike the right balance could further disenfranchise hard-to-reach groups within health care, exacerbating health disparities.[13]

The case provides no information on the relationship between JT and Dr M, but the outcome of Dr M's counseling JT to reduce meat consumption will be significantly influenced by this relationship. It is at this level that best practice in the case should be determined. A long-standing, trusting patient-physician relationship would enable Dr M to acquire authentic, comprehensive knowledge of JT's socioeconomic status and awareness of JT's access to fresh foods and current dietary patterns. Dr M's discussion of JT's diet and lifestyle choices should focus on the best care for this patient. JT currently has low cardiovascular risk. We know little else about JT's health story, family history, body mass index, or social living arrangements. While there is clear evidence that plant-based diets and reduced red meat consumption lower risk for cardiovascular disease, obesity, and diabetes,[14] adding a further element to this discussion—choosing foods that mitigate climate impact—would hamper the clearer message of choosing a diet that promotes health.

It is important for clinicians to be aware of the potential for their general environmental advocacy to harm the individuals they counsel in a number of ways. Firstly, physicians must be mindful of what advice is realistic for patients to follow, as this advice has implications for trust. JT's low socioeconomic status and habit of eating meat-based free meals at work could limit the effectiveness of any dietary advice that Dr M would ideally like to offer, even if Dr M was already counseling JT on how to better manage personal health issues. If not carefully framed, Dr M's advice could harm their relationship and act as a barrier to JT engaging with health services. Consideration of this point is of particular importance when providing advice that is not prompted by the patient's own health needs. As we have noted, trust in physicians is based on people believing their own interests are prioritized. Particularly when counseling people in hard-to-reach groups from communities that have historically had reasons to distrust health services, physicians must be mindful that any suspicion on the part of patients that the advice given is not based on their own immediate needs risks having a deleterious impact. Any advice Dr M provides to JT thus should be based on an assessment of JT's willingness and ability to respond to it. Once physician advice is perceived as out of touch, it may be hard to regain patient trust. If a patient is reliant on free meals at work, unless the menu offers healthy, tempting meat-free choices, it may not be appropriate to suggest a reduction in meat consumption.

Secondly, Dr M's general advice to JT to reduce meat consumption could inadvertently lead to worse personal health choices or undernourishment if it fails to attend to JT's situation and receptivity to change. As we have highlighted, environmental advocacy should not be at the expense of personal health promotion. Dr M should consider how best to practically and ethically advocate for environmental issues, perhaps by targeting specific groups. Given that people in higher-economic groups are likely to have extensive dietary options, they arguably have a greater responsibility to shift to diets less reliant on meat. Alternatively, Dr M could focus on the wider social determinants of health that affect JT's health choices, including JT's reliance on free meat-based meals. Trying to mitigate climate change by focusing on individuals with low income, for whom behavioral change is constrained, could be seen as "victim blaming." Alternative approaches are needed.

One approach is to work closely with communities to advocate for better health.[15] The current case suggests the importance of emphasizing such engagement and the need to ensure that advocacy does not undermine the health of individual patients like JT. Dr M might be better off working with local community groups and the restaurant to provide a

more varied menu. Dr M could also consider addressing local food insecurity that restricts residents' dietary choices by initiating a fresh fruit and vegetable prescribing program—again, with input from trusted community members. Information on climate change and diet could still be provided at Dr M's clinic and perhaps act as a useful catalyst for community discussion when related to other initiatives. A community-informed approach to advocacy for dietary change should not detract from Dr M's responsibility to focus on individual patient interests but rather help inform and tailor any of Dr M's public advocacy activities.

Responsibility for Change?

Although Dr M is committed to eating animal protein only when it's "locally sourced and organic," consuming locally produced food is unlikely to impact global warming.[16] However, when physicians offer advice to the public and not just to specific patients, as citizens, they are also bound to follow their own advice in morally similar circumstances. For example, if physicians advise the public to wear face masks when leaving home to prevent the spread of a communicable disease, they will be expected to follow such advice in similar circumstances. Similarly, physicians' suggestion that the public reduce meat consumption to protect the environment has implications for their personal behavior, as protecting the environment contributes to the common good—"the good of all and of each individual"[17]—including their own good. As they are the ones giving the advice, physicians arguably have a greater obligation to follow it. However, the responsibilities that attach to public physician advocacy risk placing professionals in difficult positions.

In politically polarized environments, offering advice on public issues often means entering volatile, disputed spaces. Food choices are determined not only by a medico-scientific evidence base, but also by an array of other factors, including pleasure,[18] emotions,[19] cultural practices,[20] and industry lobbying.[21] As a result, physicians acting as "role models," as suggested by the AMA, could result in their becoming embroiled in heated debates that many may feel unprepared for. Once the personal behavior of physicians becomes a matter of public interest, medical professionals and their families could receive negative attention in the press or on social media, perhaps based on dubious information. More specifically, physicians' engaging in behavior that runs counter to their advice (eg, to reduce meat or alcohol consumption) that is witnessed by their community, patients, or journalists—for example, consuming an occasional steak or a glass of wine—may result in harsh judgment.[22] Advocacy can also lead to public disputes among physician colleagues who disagree on matters of fact or ethics.[23] To maintain public trust in physicians and health services, strategies and education are required to support advocates in navigating the responsibilities associated with the role,[24] including enhanced ethics education that covers new advocacy-based issues spanning private and public interests and not merely traditional medical ethics problems.

Interprofessional and Service User-Led Advocacy

Responding to complex contemporary health challenges, including climate change, requires a wide range of expertise. Physician advocacy in its individual and social aspects is an extension of patient-centered care. A patient-centered approach to advocacy highlights the need to advocate for and respond to patient needs within a wider social context.[25,26] Similarly, nurses' advocacy for health care service users' independence represents an extension of the principle of autonomy in nursing.[27] Responsibilities for advocacy extend beyond medicine and nursing to social work and

public health.[28,29] It would be prudent for physicians to approach advocacy explicitly as an interprofessional endeavor and to gain understanding of the kinds of expertise that different health professions contribute. When addressing dietary choices, for example, physicians should include nutritionists and dietitians in the conversation. Importantly, the rise of patient and citizen engagement has led to service users becoming health advocates.[30,31] Community buy-in thus should be sought for an interprofessional advocacy effort to ensure that community members' needs are met and their voices heard.

Conclusion

Deciding whether to advise a patient with low income to reduce meat consumption for environmental reasons should be informed by the circumstances of that individual. Possible food insecurity in the case suggests that alternative avenues for advocacy should be sought. If physician advice is perceived as irrelevant, trust and the patient's engagement with health services could be undermined. The focus of the case on physician responsibilities places too great a burden—in terms of times and expertise—on one profession. It also misses the opportunity to adopt an interprofessional, community-based approach more suited to the practical and ethical complexity of the issue.

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The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

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CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

How Should Clinicians Respond to Patients Experiencing Ongoing Present Traumatic Stress of Industrial Meat Production

Rachel MacNair, PhD

Abstract

Slaughterhouse work is traumatizing. Workers experience posttraumatic stress disorder (PTSD) symptoms, especially as dreams of perpetrating violence and as emotional numbing and detachment. Workers' increased likelihood of committing violence is demonstrated both anecdotally and quantitatively. This commentary on a case considers how clinicians should respond to workers' PTSD symptoms. Clinical interventions for trauma typically assume that the traumatic experiences are over, in the past—that is, not part of present, everyday work and life experiences of the trauma patient. This article suggests reasons why perpetration-induced traumatic stress should be understood as a continually *present*, in addition to being a *post*, traumatic stress disorder. Importantly, interventions for slaughterhouse workers must focus on cultivating their awareness of traumatization and its symptoms in real time. This article also describes the inadequacy of current research and practice for helping patients for whom retraumatization continues as part of their everyday work.

Case

LM is a meat plant worker referred by a primary care clinician to Dr B, a community psychiatrist. LM oversees slaughter protocols at the plant and has experienced recurring sleep disruptions (eg, nightmares about mass killing of nonhuman animals), anxiety, depression, irritability, and emotional volatility since beginning work at the plant months ago. LM tells Dr B that they feel detached from loved ones, noting that things they used to enjoy no longer bring contentment or pleasure. LM also experiences new-onset fatigue and back pain and feels hopeless about alternative job opportunities. LM states, "Where else is someone with my background and skills going to find a job near where we live?"

Dr B diagnoses LM with posttraumatic stress disorder (PTSD). Anxiolytics and antidepressants won't alleviate key sources of LM's symptoms, but it seems unreasonable to counsel LM to quit their current means of earning income. Ultimately, this is a challenge to clinical care models that can accommodate *post*traumatic stress and present-centered therapeutic means of navigating posttraumatic stress and its

symptoms[1] but not how to help workers for whom public demand for meat creates ongoing, present, and future exposure to trauma and continual retraumatization.

Commentary

PTSD is a concept that was first defined for combat veterans and then expanded to all forms of trauma.[2] Initially, most PTSD research focused on people as victims of trauma, but the idea that perpetrating violence can also traumatize perpetrators has been mentioned in the fifth and most recent edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*).[3] The term *perpetration-induced traumatic stress* (PITS) can be applied when perpetration is the etiological stressor but PTSD is the official diagnosis. Commonly, the source of trauma that is the etiological stressor is one that is in the past—for example, combat, crimes, domestic abuse that has been escaped, natural disasters, or major accidents. When the trauma itself has ceased, then the patient's therapeutic needs are easier to provide for. When the patient is still experiencing a trauma, however—for example, combat, crime, or domestic abuse that is still ongoing—then therapeutic needs become more complicated. Ideally, the first step in therapy is to stop the trauma entirely. Cases for which this is not a workable solution—as when first responders experience trauma on the job—have received little research attention. Moreover, there is very little research on PITS, much less on PITS in slaughterhouse workers.

Symptoms of PTSD and PITS

Diagnosis of PTSD is consistent with the symptoms mentioned in the above case and with those observed in slaughterhouse workers. There is some evidence that posttraumatic symptoms can also manifest in people who commit violence not only against humans but also against nonhuman animals. Jennifer Dillard has discussed how slaughterhouse workers suffer: "While the average American will never see the inside of a slaughterhouse and may be able to eat a hamburger without confronting the pain and terror of a beef cow's final moments, thousands of slaughterhouse workers across the country face that troubling predicament every day, creating an employment situation ripe for psychological problems."[4] She identifies PITS as one of the frameworks for understanding these negative psychological sequelae. Proper large-scale studies are yet to be done, but below I describe some case studies that illustrate the problems of dreams, detachment, and perpetrating other forms of violence.

Dreams. Two examples that illustrate intrusive dreaming about the traumatizing events come from a qualitative study of unstructured interviews with South African slaughterhouse employees.[5] One slaughterhouse employee states: "In my dream I see the bleeding line, just the cattle hanging on the line, all whose heads are off. I get this picture often. It's not nice to dream about blood; you wake up wet with sweat." However, PITS dreams commonly have not only the standard features of PTSD dreams, but also the added feature of the victims of violence turning around and attacking the attacker within the dream.[6] Former US-based slaughterhouse employee Virgil Butler relates his own experience: "Out of desperation you send your mind elsewhere so that you don't end up like those guys that lose it.... Or the guy they hauled off to the mental hospital that kept having nightmares that chickens were after him. I've had those, too (shudder)."[7] A South African worker describes surveillance by slaughterhouse animals: "Sometimes I saw myself slaughtering the animals, but you see eyes, I saw, eyes of the animal. It's like its watching me. That thing, that dream, I didn't feel well even when I came back to work, but I keep on checking the eyes to see its watching me, because I saw it in the dream."[5]

Detachment. Butler also illustrates the symptom of emotional numbness: "You find something else to dwell on to try to remove yourself from the situation. To keep your mind from drowning in all those hundreds of gallons of blood you see."[7] Ed Van Winkle put a similar point about his employment in an Iowa slaughterhouse this way: "If you work in the stick pit [where the hogs are killed] for any period of time, you develop an attitude that lets you kill things but doesn't let you care. You may look a hog in the eye.... You may want to pet it. Pigs down on the kill floor have come up and nuzzled me like a puppy. Two minutes later I had to kill them—beat them to death with a pipe. I can't care."[4] A worker in South Africa concurs: "As time passes, you get used to it. You feel nothing. You can imagine, if you kill a thing a 1000 times over and over, you wouldn't have feelings after a while. It kills you on the inside, an abattoir, it kills you. You can be full of blood, it will not bother you."[5]

Other forms of violence. Van Winkle also stated: "Every sticker [hog killer] I know carries a gun, and every one of them would shoot you. Most stickers I know have been arrested for assault."[4] Similarly, a worker in South Africa spoke of perpetrating violence on intimates: "What I was having was just to hit. I need to hit, especially my girlfriend. Sometimes, even if you think you can make a mistake[s] you hit him because ... you don't have a heart for him. That is why most people at stunning box, they can do it, they can hit their girlfriends. Say 'hey, I hit my girlfriend yesterday,' or 'I beat my wife yesterday.'"[5]

Slaughterhouse employees' perpetration of violence is corroborated by a quantitative analysis of data collected between 1994 and 2002 from 581 US counties in states with right-to-work laws. The study found that, compared with other industries (primarily manufacturing), slaughterhouse employment was associated with increased arrests rates, including arrests for violent crime and rape.[8]

Intervention

There is currently remarkably little to be said about treatment. Quantitative and qualitative studies of slaughterhouse workers are sparse and primarily focus on the problem of symptoms rather than solutions. When recommendations are made for amelioration of workers' situation as a whole, they are mostly for better safety protocols only to help avoid physical injury. For treatment of psychological injury, we can look to the literature on PITS in other groups.

Insight. Understanding the universality of one's experience and that one's feelings are not unique can be a powerful source of relief. As one therapist for combat veterans put it: "I saw many clients come to our inpatient program thinking that they were alone in their pain. They judged themselves uniquely crazy, weak, and/or cowardly for having had problems.... There was some genuine relief that came from seeing that others had these problems, even if the problems continued."[9] This is the only way of addressing the psychological trauma I have found in the literature to be somewhat effective even when the trauma is continuing.

Behavior therapies. Cognitive-behavioral therapies are common, and eye-movement desensitization and reprocessing has shown some success in mitigating posttraumatic symptoms.[9] Two techniques that seem to be contraindicated are prolonged exposure and expressive writing. Prolonged exposure, also called flooding, would be indistinguishable from simply continuing to work in the slaughterhouse. Both of these

techniques might work well for victims of trauma, but flooding in particular would seem to bring about more agitation in perpetrators than victims.

Atonement. Most of the therapy techniques for any form of trauma presume that the traumas are in the past. Trying to treat traumatization that is ongoing, such that all progress made is undone by the trauma recurring, is an unusual approach. An analogy might be in treating soldiers so they can be sent back into battle, but normal practice is to pull soldiers out of battle if they need mental health treatment. One of the most effective treatments for PITS is to help undo the damage caused by way of atonement or bearing witness. For example, combat veterans from Vietnam could go back to Vietnam to assist in providing health care for the people there now; those who have done so have reported great relief from symptoms.[10] In the case of slaughterhouse workers, perhaps working with animal rights groups or on animal compassion projects would be therapeutic; more research is needed. However, the effectiveness of this technique of helping relies even more than the others on the cessation of the traumatizing circumstances.

It is understandable that a therapist would see it as unrealistic to ask patients to cease doing their job if there is no alternative way of making a living readily available. However, if there are methods that can address the trauma even while retraumatization continues, there is inadequate study to ascertain what those would be, and experience so far does not offer much guidance.

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CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

How Should Food Offered by Health Care Organizations Meet Individual, Community, and Ecological Needs?

Jennifer L. Weinberg, MD, MPH, MBE

Abstract

This commentary on a case suggests why health care organizations have responsibilities to serve food to their patients, guests, and employees that is ethically, nutritionally, culturally, and religiously appropriate. This article also investigates how inclusive, equitable, sustainable food services are key dimensions of health care organizations' civic and stewardship responsibilities to individuals and communities.

The American Medical Association designates this journal-based CME activity for a maximum of 1 AMA PRA Category 1 Credit™ *available through the* AMA Ed Hub™. *Physicians should claim only the credit commensurate with the extent of their participation in the activity.*

Case

NN is hospitalized due to pneumonia and eats only plant-based foods. Vegan food options are few, and NN's nutrition has been limited to sides of vegetables, plain toast, fruit juices, and fruit salads for a few days. NN has requested more nutritionally dense foods that are easy to prepare (ie, quinoa, oatmeal, whole vegetables, whole fruits, nuts).

The organization's dietetics administrator has apologized and explained that their food offerings are limited by their suppliers. An order has been placed for some of the items NN requested yesterday, but the supplier has reiterated that demand for meat and dairy alternatives is just too low to warrant their regular availability and delivery without the organization's food supply costs increasing.

NN does not have anyone at the time who could bring her prepared, or even raw, plant-based foods from outside the hospital. NN's caloric intake has been substantially reduced, despite high caloric demands of illness recovery; NN is losing weight, feels hungry, and is worried. NN asks, "I've requested simple items that are easy to prepare. I'd even eat some items raw. Why is this organization not able to meet my basic health nutritional needs?"

Members of NN's clinical team wonder how to respond.

Commentary

For all hospitalized patients, proper nutrition is needed to mount an effective immune response, heal wounds, build and maintain strength, and cope with acute illness, although nutrition needs vary based on one's acute as well as chronic health needs. The types of food required within a culture for optimal nutrition and acceptance are influenced by personal religious, moral, and other beliefs. Serving patients food that is nutritionally, culturally, religiously, and morally appropriate and acceptable to them is a critical component of providing effective, inclusive, and equitable health care services. This is a key component of patient-centered care, wherein the recipient of health care is seen as a person within their own context and the delivery of care honors dignity and autonomy during the care process.

Malnutrition—including undernutrition, overweight or obesity, and imbalances in various specific nutrients—results in increased complications, greater morbidity and mortality, longer hospital stays, higher treatment costs, more frequent readmissions, and a substantial economic burden.[1,2] Conversely, treating disease-related malnutrition during a hospital stay significantly improves outcomes.[3] Hospitals have ethical obligations to prevent disease and promote public health in addition to financial incentives to prevent readmissions. Indeed, prevention and health promotion in an era of epidemic chronic disease are principal obligations of most hospitals' work. Hospitals cannot fulfill their mission to prevent disease and promote health without paying attention to individualized nutrition as well as the broader impacts of their purchasing and serving food to patients, staff, and visitors. To meet these ethical and nutritional requirements and fulfill their missions, hospitals must acknowledge individual, cultural, economic, and community and global factors.

Helping Patients Choose

A coordinated multidisciplinary approach is needed to improve nutrition care for better patient outcomes in the short- and long-term and to systemically embed culturally sensitive and individualized care into routine clinical practice. Just as clinicians have a professional obligation to guide patients to enact and practice healthy lifestyle behaviors, so the hospitals in which they work are ethically obligated to promote and facilitate healthy dietary choices by offering nutritionally balanced foods that meet the dietary needs of the diverse patients they serve.

Providing food preparers, staff, and clinicians with education and tools to offer individualized nutrition and medically appropriate—as well as culturally sensitive, desirable, delicious, and health-promoting—food options for a variety of populations is a key part of supporting patients in achieving better outcomes. For example, catering and meal service staff can facilitate patient meal selection at the bedside in accessible ways by using easy-to-understand individualized "e-menus" listing a variety of medically appropriate, healthy, and diverse food options that clearly describe the ingredients and relevant nutritional facts. Electronic bedside meal ordering systems had greater effects on patient dietary intake and satisfaction and on waste and cost reduction than traditional menus.[4] Patient-centered food service, such as more informative and interactive meal-ordering systems, can be offered when medically appropriate to optimize a patient's nutrition options.[5] Engaging professional, creative, knowledgeable chefs and nutrition professionals who can guide the adjustment of recipes and educate food preparers about healthy ways to adapt food preparation by cooking from scratch with whole food-focused ingredients and healthy food preparation techniques (eg, baking instead of deep frying) would allow hospitals to provide more desirable,

palatable, and familiar foods using healthier cooking methods, thereby satisfying patients' health requirements in an enjoyable and comforting way.[6]

In sum, patients' food choices can be individualized to best meet their health and nutritional needs while respecting their autonomy by taking a team-based approach that integrates input from the patient, physicians, nutrition and culinary professionals, and other relevant providers during the acute stay, discharge process, and follow-up care.[5] This collaborative and educational approach would ensure that patients have proper nutrition to aid acute recovery as well as follow-up nutrition care in the community to enhance long-term healing, management of chronic disease, and prevention of readmission.[7] A patient-centered culinary medicine approach teaches patients healthy food preparation methods that support consumption of desirable, health-promoting foods while considering the social, cultural, economic, and emotional meanings that patients attach to food.[8]

Special Diets

Plant-based. A balanced healthy diet that emphasizes plant-based foods, such as fresh fruits and vegetables, whole grains, legumes, nuts, and seeds, can reduce the risk of many chronic conditions, including hypertension, heart disease, stroke, and some cancers,[9] while aligning with the ethical preferences of many Americans who identify as vegetarian or vegan.[10] Hospitals that increase access to healthy foods, including plant-based foods, have seen positive results, including "improved patient satisfaction, enhanced nutrition quality, and improved community relations."[11]

Not all plant-based diets are equal in terms of reduced disease risks, however. Fresh, organic, minimally processed, and sustainably grown food offers many potential health, environmental, and ethical benefits. Foods grown under free-range conditions and grown and prepared with fewer pesticides, no artificial colors or preservatives, and no routine use of hormones and antibiotics offer health benefits for farm workers, animals, the environment, and consumers.[12] Moreover, organic regenerative farming maintains biodiversity and healthy soil that is more resistant to the impacts of climate change while reducing greenhouse gas emissions, chemical runoff into water supplies, and the risk of pathogen contamination.[12] Organically grown produce also has lower concentrations of pesticides and heavy metals and may have greater concentrations of essential nutrients, such as antioxidants and some vitamins and minerals.[12] Therefore, hospitals have an ethical obligation to promote public health by sourcing the highest-quality food—including organic, ethically produced, and minimally processed food options—whenever possible.[12]

Other diets. Patient-centered care should also accommodate conditions—such as celiac disease, diabetes, allergies, lactose intolerance, pancreatic insufficiency, cardiovascular disease, kidney and liver issues, and other health conditions—that affect patients' nutritional needs. Studies suggest that many inpatient settings are not meeting the nutrient needs of patients who require therapeutic diets, including those with food allergies.[13] Food allergies and cross-contamination of foods like gluten for patients with celiac disease can also result in significant adverse health outcomes, such as anaphylaxis and acute worsening of disease.[14] While some hospitals use systems like wristbands to convey significant food allergies,[15] many people who contribute to ordering, preparing, and delivering food are not trained to—and fail to—communicate about food allergies and specialized dietary needs, leading to patients' accidental allergen exposure.[14] Technological tools that help alert team members to allergies at

each stage of the food provision process, as well as training and clear communication, can help keep patients safe and better ensure adequate nutrition choices to keep patients healthy.[15] Integrating a patient-centered approach as an organizational philosophy, as opposed to a task-focused model wherein the patient is a passive recipient of health care, is a key component of providing ethical and effective care and facilitating more effective communication,[16] both of which are relevant to the provision of safe and appropriate nutrition. Furthermore, hospital food services are a tangible point of outreach to the community and significantly impact the public's assessment of healthy nutrition.[17]

Cultural Considerations

Equitable, quality health care must be offered without discrimination regardless of a patient's religion, culture, or ethnicity.[18] Serving food that is unacceptable for health requirements or for moral, cultural, or religious reasons can exacerbate the discomfort of illness or hospitalization. The provision of equal care to all patients therefore requires that hospitals adjust the types and preparation of foods offered to patients in a manner that is sensitive to moral, health, cultural, and religious context.[19]

Food and dietary practices are often a key part of one's cultural identity; taste and palates are trained and influenced by cultural, moral, and religious factors.[19,20] Providing culturally sensitive health care, including serving food that is acceptable according to an individual's cultural and religious mores, is important for establishing trust between patients and health care professionals, for respecting individual autonomy,[19] and for helping patients feel they are respected and treated with dignity. Patients' distrust of the preparation and type of food served can lead to additional distress, worry, and insufficient nutritional intake that may subsequently contribute to poorer outcomes and patient satisfaction.[19] Therefore, collecting information about food habits and religious, cultural, or moral taboos from each individual should be standard upon nonemergency admission, and culturally inclusive menus should be offered that provide food options that align with patients' cultural, religious, and moral preferences.

Economic Argument

Public and private institutions, including hospitals, spend billions of dollars each year on food.[21] Although an institution must remain fiscally solvent to fulfill its mission in the long term, its business practices should not come into conflict with its broader mission to promote health. Hospitals must balance the logistical and economic constraints associated with feeding large numbers of people every day by respecting conventional supply chain norms of efficiency, standardization, and affordability while ensuring environmental stewardship and social equity.[22] While plant-based food options may be perceived as more expensive, studies have shown that a meal plan focused on simple shelf-stable, plant-based options with olive oil can be significantly less expensive than a meal plan focusing on MyPlate guidelines that include lean animal protein, dairy, and canola oil,[23] with a vegetarian diet potentially resulting in approximately $580 per year in savings.[23,24] Importantly, one hospital system found that the cost of vegetarian meals was roughly half that of meat-based meals.[25]

Paying attention to proper nutrition more generally is fiscally responsible. There are tremendous costs, financially and ethically, in ignoring the provision of healthy, delicious, and individualized food and in failing to prevent chronic disease. Malnutrition in hospitalized patients results in poorer outcomes, slower recovery, a greater chance of readmission, and a substantial economic burden.[1,2] For example, the cost of acute care

for a malnourished patient is approximately $2000 more than for a well-nourished patient.[26] In terms of chronic disease prevention, a 1% reduction in dietary-related health risks—such as elevated weight, blood pressure, glucose, and cholesterol levels—would save $83 to $103 per person per year in medical costs.[27]

Local and Global Impacts

In addition to having significant purchasing power, institutional food services use many natural and human resources and generate substantial waste, making them key players in the larger food system. Health care institutions have an ethical obligation to use their role and money to promote health and resilience in their communities and to mitigate larger inequities by embracing their responsibility to address social, economic, and physical determinants of health.[28] Sustainable hospital food options thus must consider health and environmental impacts on a local and global level.

One emerging solution for hospitals to balance economics, supply chain impacts, environmental stewardship, and social equity in an ethical manner is the development of hospital gardens and farms. For example, St Luke's University Health Network has partnered with a local nonprofit, Rodale Institute, to develop a farm on acreage surrounding one of its health campuses that yields thousands of pounds of produce each year that is served at all 10 of its hospitals.[29] Similarly, Boston Medical Center produces as much as 3 tons of produce annually on a 2658 sq ft modular rooftop growing space to serve 1800 meals daily,[30] support an on-site teaching kitchen, and donate free vegetables to patients with low incomes in the community.[31]

Health care institutions can also use their purchasing power to support their local communities. Working with local vendors to purchase ingredients that align with different ethnic and cultural traditions provides economic support to the community while procuring more culturally inclusive meals for the communities served and employed by the institution.

Conclusion

Hospitals and the food they provide have immense impact, and therefore hospitals have immense responsibilities. Hospitals should remain cognizant of how their food offerings affect patients, employees, their mission, and the planet. A global shift in dietary habits towards plant-based diets has both health and sustainability benefits. Providing appropriate and health-promoting dietary options is beneficial to patient health, necessary to respect patient dignity and provide person-centered care, and a way for hospitals to exercise institutional power in service of ecological sustainability.

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MEDICAL EDUCATION

What Should Health Professions Students Know About Industrial Agriculture and Disease?

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Abstract

Concentrated animal feeding operations (CAFOs) perpetuate deforestation, biodiversity loss, pollution, and climate change; increase risk of zoonotic disease transmission and antimicrobial resistance; and exacerbate environmental and health injustice. Risks CAFOs pose to human health demand the attention of clinicians and those who teach them, since they have duties to respond with care to patients and communities where health is undermined by CAFOs' presence.

Industrial Agriculture and Health

As the global population continues to increase, totaling 8 billion people in November 2022,[1] there is a growing trend toward industrial-scale farming in order to feed everyone. Yet industrial agriculture also poses serious risks to environmental and human health. Of particular concern is intensive livestock production, known as concentrated animal feeding operations (CAFOs). Thirty percent of all land in the world and 70% of all agricultural land is used in livestock production.[2] CAFOs contribute to increased risk of zoonotic disease, antibiotic-resistant bacteria, climate change, deforestation, biodiversity loss, environmental pollution, and environmental injustice and health disparities.[2,3,4,5] *Environmental injustice* refers to specific groups' and communities' disproportionate exposure to environmental harms, as well as their unequal protection under the law, regulations, government programs, and policies that simultaneously impact both human health and the environment.[6] Considering the many risks that CAFOs pose to human health and the accompanying ethical concerns that CAFOs raise with respect to health equity, it is important for physicians to understand these risks and the ethical responsibilities these risks entail.

Zoonotic Disease

Industrial animal farming increases the risk of emerging infectious diseases.[3] Approximately 75% of emerging infectious diseases are zoonotic in origin, the majority of which have been linked to environmental change and the growth of CAFOs.[4,5,7] Intensive animal farming is a primary driver of large-scale land use change that often leads to losses in biodiversity, or replacing natural biodiversity with a dense population of a single species with low genetic diversity.[4,7] Loss of biodiversity can increase the risk of pathogen spillover, as increasing livestock population size and density, as well as high

levels of genetic similarity among livestock, can facilitate pathogen transmission and mutation.[8] As more natural ecosystems are converted into agricultural land, interactions among humans, domesticated animals, and wild animals will increase, further increasing the risk of pathogen spillover from one population to another.[8]

Antimicrobial Resistance

Each year, over 2.8 million antibiotic-resistant infections occur in the United States, causing roughly 35 000 deaths.[9] The primary driver of antibiotic resistance in humans is the widespread overuse of antibiotics.[9,10,11] CAFOs greatly contribute to the emergence of antibiotic-resistant bacteria because approximately 80% of all antibiotics sold in the United States are used in animal agriculture, and about 70% of these are medically important for human medicine.[10] Antibiotics are widely used in livestock farming for disease treatment and prevention as well as growth promotion and improved feed conversion efficiency.[11] While antibiotic use in chickens in the United States decreased 70% between 2013 and 2017 as a result of falling consumer demand, US Food and Drug Administration policy, and state regulations, the use of antibiotics in the cattle and hog industries is still exceedingly prevalent.[9] In one study of watercourses downstream of hog CAFOs in North Carolina, researchers found at least 1 antibiotic resistant bacterial gene in 100% of water samples and at least 3 antibiotic resistant genes in 92% of water samples.[5] The excessive use of antibiotics in animal agriculture can result in antibiotic pollution because though "the half-life of antibiotics ranges from hours to hundreds of days," antibiotic residues can last much longer.[12] Many of these residues are contained in animal waste, which can contaminate the environment and act as a reservoir for the mixing of genetic elements, leading to new antibiotic-resistant bacteria through genetic exchange mechanisms or mutations.[12]

Climate Change

Agriculture is one of the largest contributors to climate change, while also being one of the economic sectors most at risk from it.[13] Climate change has been associated with a wide range of detrimental health effects, including "increased respiratory and cardiovascular disease, injuries and premature deaths related to extreme weather events," increased risk of hunger and malnutrition, increased prevalence of foodborne and waterborne illnesses, and adverse effects on mental health.[14] It is estimated that, in 2015, global food systems contributed to 34% of total anthropogenic greenhouse gas (GHG) emissions[15] and that, today, food systems may account for as much as 40% of all GHG emissions.[13] Livestock systems account for the majority of these emissions, making up 57% of all food system GHG emissions.[5] In addition to carbon emissions, livestock systems are emitters of other GHGs, such as nitrous oxide and methane, the latter of which is particularly significant because it has 23 times the global warming potential of carbon dioxide.[2] Animal agriculture is the second largest contributor to human-made GHG emissions after fossil fuels and, as mentioned, is also a leading cause of deforestation and environmental pollution, all of which contribute to climate change.[16]

Water, Air, and Soil Contamination

CAFOs are a major source of environmental pollution. Fertilizers and pesticides used to grow feed crops often run off cropland, polluting surface waters and groundwaters. Excess nitrogen from chemical fertilizers can lead to harmful algal blooms that can affect drinking water and cause hypoxic dead zones in which aquatic life dies off due to reduced levels of oxygen in the water.[17] CAFOs also produce immense amounts of animal waste that is typically collected in large, open pits called lagoons. These lagoons

allow nitrogen, phosphorous, ammonia, methane, hydrogen sulfide, heavy metals, antibiotics, and microorganisms to enter the soil and contaminate surface water and groundwater and even the air.[16,17,18] In fact, CAFOs are considered sources of water pollution by the Environmental Protection Agency,[18] which reported in 1998 that farming accounts for 70% of the pollution in US rivers and streams, affecting more than 173 000 miles of waterways.[19] While many pesticides used in commercial agriculture, including for animal feed crops, have not been tested for their toxicity, approximately a third are classified as highly hazardous to human health, wildlife, or ecosystems.[5] Such pesticides are known to increase the risk of cancer; disrupt the body's reproductive, immune, endocrine, and nervous systems; and suppress the immune system.[19] Additional health risks caused by pollution from CAFOs include respiratory diseases, exposure to food-borne pathogens, and the emergence of antibiotic-resistant bacteria.[19] Individuals most at risk are those who work at and live near CAFOs.[18]

Environmental and Health Injustice

Because individuals who work at and live near industrial farms are more likely to come from low-income communities of color, CAFOs directly contribute to health disparities, environmental injustice, and environmental racism.[20,21] Studies show that people living near CAFOs—who tend to be people of color with low income, irrespective of population density—are at elevated risk of developing respiratory symptoms, headache and nausea, neurobehavioral symptoms, and psychological impairments due to exposure to contaminants released by CAFOs.[20,21] Pregnant women and children are particularly susceptible to such risks. Workers in US factory farms face additional burdens, as they earn low wages with few benefits and have little, if any, job security. Moreover, because farm workers are exempt from both the Fair Labor Standards Act and the National Labor Relations Act, they regularly face systematic human rights violations with few protections and little legal recourse.[16] Reports show that food system workers experience high rates of occupational injuries, illness, and mortality.[22] Meat processing, in particular, is "one of the most dangerous jobs" in the United States, as meat processing workers are more than 3 times as likely as the average worker to suffer serious injuries while working—including an average of 2 accidental amputations per week.[16] Approximately 25% of CAFO workers also suffer from at least one serious respiratory problem, such as chronic bronchitis, sinusitis, nonallergic asthma, or organic dust toxic syndrome.[2,18,21]

Physician Duties

Physicians have an ethical responsibility to educate themselves about the impacts that CAFOs can have on human health—including increased risk of emerging zoonotic diseases, antibiotic-resistant bacteria, and health-related conditions stemming from climate change and environmental pollution, all of which disproportionately burden low-income communities of color—and to work within their practices to minimize and address these impacts. Physicians working in rural communities in particular should familiarize themselves with the health effects of CAFOs among industrial agricultural workers and community members living nearby.[18] More broadly, physicians should communicate with patients about their jobs and work-related risks and be cognizant of the main industries operating in the area. Patients known to work at CAFOs should be monitored for viral and antibiotic-resistant bacterial infections, as they are at severe risk for such diseases.[3,18] Physicians' ethical responsibility of antibiotic stewardship should extend beyond limiting the prescription of antibiotics. Physicians should educate patients about antibiotic resistance, advocate for decreased use of antibiotics in livestock farming, and lobby their own hospitals and health care institutions to only purchase meat raised without the use of nontherapeutic antibiotics.[9,10] As consumers,

physicians can also choose to consume less meat and only purchase meat that is sustainably raised without the overuse of antibiotics. Physicians' ethical duty to inform patients of known health risks and to help manage those risks extends to risks posed by CAFOs. Because CAFOs are a large part of the modern food system, the health risks they pose also highlight how physicians' ethical responsibilities extend to their role as consumers. To better care for patients—and themselves—physicians have a duty to learn about the health risks associated with our food system, inform patients of those risks, and advocate for policy changes to minimize those risks.

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AMA CODE SAYS

AMA *Code of Medical Ethics*' Opinions Related to Meat and Health

Scott J. Schweikart, JD, MBE

Abstract

Meat consumption and production produce a wide range of health and social consequences. The AMA *Code of Medical Ethics* and Principles of Medical Ethics do not speak directly to the issue of meat consumption. However, the AMA *Code* and Principles do provide guidance for physicians when considering their obligations to educate and counsel patients.

Meat Consumption and Production

Meat production and consumption in modern society have come under increased scrutiny because of their worldwide influence on both individual and public health, as well as their broader impact on the global climate. The ethical issues are varied, encompassing such problems as diet-related illness, obesity, harm to the environment, and cultural conflicts. While the American Medical Association (AMA) *Code of Medical Ethics* does not speak directly to issues regarding meat, it certainly offers physician guidance on issues related to meat consumption and production, such as preventive care, patient rights, and community improvement.

Health Promotion and Preventive Care

Meat consumption has well-known linkages to obesity and other health problems.[1] Physicians should be aware of such associations and consider what role they should play in preventive measures. Opinion 8.11, "Health Promotion and Preventive Care," explains that physicians have a "professional commitment to prevent disease and promote health and well-being for their patients and the community."[2] Opinion 8.11 further notes:

> The clinical encounter provides an opportunity for the physician to engage the patient in the process of health promotion. Effective elements of this process may include educating and motivating patients regarding healthy lifestyle, helping patients by assessing their needs, preferences, and readiness for change and recommending appropriate preventive care measures. Implementing effective health promotion practices is consistent with physicians' duties to patients and also with their responsibilities as stewards of health care resources.[2]

Fulfilling this ethical obligation in the context of meat consumption may require physicians to educate their patients on dietary choices regarding meat and to offer

solutions or alternatives to help reduce meat consumption with the aim of preventing chronic disease.

Patient Rights

Meat consumption is often tied to culture and identity. Patients have a right to respect and dignity, which includes respect for their culture and respect for their treatment decisions. Opinion 1.1.3, "Patient Rights," states that "health and well-being of patients depends on a collaborative effort between patient and physician in a mutually respectful alliance."[3] Hence, any discussion physicians have with their patients regarding meat consumption should be mindful of meat's place in a patient's cultural life. Physicians should understand that the impacts of meat consumption go beyond nutrition and should work with their patients—by incorporating patients' cultural needs and wishes—in crafting a nutrition plan that is both medically sound and ethically appropriate.

Improving Communities

The broader environmental impacts and global risks of meat consumption and production are now widely understood.[4] Some examples of global risks directly related to industrialized meat consumption are deforestation and forest fires, climate change, human rights abuses, wildlife extinction, and the increased frequency of zoonosis and pandemic risk.[4,5] Considering these significant consequences and their impact on global public health, physicians should be mindful of ways they can help contribute to reducing these risks. The Principles of Medical Ethics call on physicians to "recognize a responsibility to participate in activities contributing to the improvement of the community and the betterment of public health."[6] Satisfaction of such a broad obligation as outlined in this principle may involve physicians making efforts—through education, individual patient interaction, or other initiatives—to reduce meat consumption in society. Likewise, the AMA *Code* details an obligation for political advocacy in Opinion 1.2.10, "Political Action by Physicians," which states that physicians have an "ethical responsibility to seek change when they believe the requirements of law or policy are contrary to the best interests of patients."[7] Physicians are already advocating for political change with regard to dietary policy. For example, the Physicians Committee for Responsible Medicine is currently lobbying the federal government to focus on "policy goals that would highlight the benefits of plant-based nutrition to improve our nation's widening health disparities."[8]

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POLICY FORUM: PEER-REVIEWED ARTICLE

How Should We Improve How Medical and Veterinary Students Learn About Human and Nonhuman Animals?

Zoe Griffiths, MA and Jeff Sebo, PhD

Abstract

This article presents 5 general points that every clinician should know about animals, health, and the environment, focusing on why animals matter for their own sakes, why animals matter for health and environmental threats, why health and environmental threats matter for animals, and how the medical and veterinary industries interact with animals. This article then offers practical advice about how to address these issues.

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Curricular Neglect

COVID-19 is a reminder that human and nonhuman health and welfare are linked. Many current uses of animals contribute to health and environmental threats, such as pandemics and climate change,[1] and harm both humans and nonhumans.[2] Yet these links are neglected in curricula where they matter most: medical and veterinary education.

Five Things Every Clinician Should Know About Animals

Our educational systems establish the beliefs, values, and practices that shape our professions, and so positive change in medical and veterinary education is necessary (or, at least, important) for positive change in medical and veterinary practice. We can start by considering 5 things every clinician should know about the intrinsic and instrumental importance of animals.

Animals matter for their own sakes. Ethicists increasingly accept that all sentient beings—that is, all beings who can experience pleasure and pain—matter for their own sakes, and scientists increasingly accept that many nonhuman animals—including all vertebrates and at least some invertebrates—are sentient.[1] It follows that many animals matter for their own sakes and that humans have a responsibility to consider their interests when deciding how to treat them.

Many industries currently treat animals like objects. Each year, factory farming kills hundreds of billions of animals, and deforestation and the wildlife trade kill trillions.[1] Many other industries harm and kill animals on a smaller—but still large—scale. But in the vast majority of cases, there is very little regulation and oversight of animal use, ensuring generally poor standards for animal welfare.[1]

Our treatment of animals matters for global health. In addition to killing many animals, industries like factory farming, as well as deforestation and the wildlife trade, also contribute to global health threats like pandemics. For instance, factory farms keep thousands of animals with weakened immune systems in toxic environments, and they use antibiotics and other antimicrobials to suppress disease spread and stimulate growth. As a result, factory farms are ideal places for novel diseases to develop and spread.[3]

Additionally, deforestation (of which factory farming is a major driver[1]) contributes to disease spread by increasing interactions between humans and wild animals, as well as by reducing forest biodiversity in ways that tend to favor mosquito species that transmit malaria, snail species that transmit parasitic flatworms, and other such species.[4] And while the wildlife trade might or might not have caused COVID-19,[5] the practice of breeding and capturing wild animals to keep or kill could easily cause future disease outbreaks.[6]

Our treatment of animals matters for the environment. These industries also interfere with delicate ecosystems, and they contribute to environmental threats like biodiversity loss and climate change.[7] For example, animal agriculture as a whole is responsible for an estimated 14.5% of global anthropogenic greenhouse gas emissions.[8] These emissions primarily take the form of methane and nitrous oxide, both of which have "global warming potential" that is orders of magnitude greater than that of carbon dioxide.[9]

Deforestation contributes to climate change as well, since forests are natural carbon sinks that capture and store carbon dioxide in the ground. So, when we clear forested land, we both release carbon dioxide into the atmosphere and diminish the planet's ability to capture and store carbon dioxide in the future. Animal agriculture and deforestation can also increase local air, land, and water pollution, thereby worsening physical and mental health outcomes for workers and local community members.[1]

Global health and the environment matter for animals. These global health and environmental threats can harm and kill nonhumans as well as humans. The COVID-19 pandemic harmed and killed many animals, not only by exposing them to the virus but also by exposing them to increased human violence and neglect, particularly when viral outbreaks and supply chain breakdowns produced mass culling of farmed animals.[1] At the time of this writing, bird flu outbreaks are having similar effects on animals.[10]

More generally, climate change will cause temperatures to rise, ice caps to melt, sea levels to rise, coastal areas to flood, and an increase in the frequency and intensity of extreme weather events like storms, floods, and heat waves. These changes will harm humans and nonhumans alike not only by exposing them to extreme weather but also by exposing them to the effects of social, political, economic, and ecological disruption, including increased human violence toward and neglect of nonhuman climate refugees.[1]

Medical and veterinary research and education still harm, kill, and neglect animals. While medical schools have phased down the use of live animals in teaching,[11] biomedical research still uses 15 to 25 million animals each year in the United States alone,[12] despite the fact that humane alternatives, such as human cells and computer models, are increasingly available. Similarly, while veterinary schools have phased down "terminal" surgeries in the required curriculum in recent years,[13] veterinary research still uses animals,[14] although the scale of this harm is currently unclear.

Medical and veterinary education support the status quo in other ways as well. Many medical and veterinary schools continue to prominently feature animal products such as meat, eggs, and dairy in their menus, despite the fact that humane, healthful, and sustainable plant-based alternatives are increasingly available. And, as we will discuss in more detail below, medical education and veterinary education generally neglect all the above points about animals, health, and the environment in their curricula as well.

How to Improve Education About Animals

Given the extent to which health professionals interact with animals, directly or indirectly, as well as how much animals matter for global health and environmental issues, it is imperative that clinicians seek to expand coverage of the importance of, and links between, human and nonhuman health and welfare in medical and veterinary curricula, as well as improve treatment of animals in medical and veterinary research and education. There are several practical steps that educators and other professionals can take to meet this goal, some of which concern medical and veterinary curricula and others of which concern related practices.

Improving medical and veterinary curricula. Where possible, medical and veterinary schools can add classes on topics related to the importance of animal welfare and the links between human, nonhuman, and environmental health. They can also support faculty in identifying relevant books, articles, authors, and speakers, as well as in adding units to existing classes and slides to existing units.[15]

Currently, instruction on animal welfare appears to be virtually completely absent in medical curricula.[16] And while medical students may no longer be using animals as part of their education, they still have access to labs conducting animal research, and they still have futures as health professionals whose beliefs, values, and practices will shape health policy. This is reason enough for them to learn about animal welfare at the start of their careers.

Likewise, while instruction on animal welfare is increasingly part of veterinary curricula, it has yet to become a core subject at most schools. Yet veterinary students have at least as much reason to learn about animal welfare as medical students, if not more reason. For instance, one study found that, after taking a course on animal welfare, veterinary students exhibited more positive attitudes towards "pest" and "profit" animals alike.[17]

Fortunately, some medical and veterinary schools are starting to adopt the One Health framework, which recognizes the links between human, nonhuman, and environmental health.[18] Nevertheless, only about half of 133 medical schools surveyed cover One Health, with a higher rate of adoption at veterinary schools.[19] And even when schools do cover One Health, topics such as farmed animals, wild animals, antimicrobial resistance, and zoonotic disease spread remain relatively neglected.[20]

As clinicians work to develop these curricula, they can also take care not to privilege some animals, such as domesticated terrestrial vertebrates, over others, such as wild animals, aquatic animals, and invertebrates. Given that humans care about some animals more than others, this kind of privileging might seem natural. But it would have the effect of reinforcing the invisibility of massive, vulnerable nonhuman populations.[1]

Making other, related changes in medical and veterinary schools. Clinicians can work to make related changes that would not only reinforce these curricular changes but also be independently valuable. Human violence toward and neglect of nonhuman animals are multifaceted, structural problems that require multifaceted, structural solutions. The more we pursue positive change in multiple areas at the same time, the more we might find that progress in each area makes progress in others easier to accomplish.

One option is for clinicians to work to phase down use of animals in science. In the context of human subjects research, we all agree that invasive, harmful, and lethal research on vulnerable populations without the possibility of consent is unacceptable, particularly when alternatives are available. By accepting this principle in the context of nonhuman subjects research as well, clinicians can support positive change both directly, by improving research, and indirectly, by making it clear that animal welfare is important.[21]

Another option is for clinicians to work to phase down animal products in school and hospital cafeteria menus (taking care, of course, to meet the health needs of consumers). As with unnecessarily harmful uses of animals in science, unnecessarily harmful uses of animals for food are unacceptable. By supporting these menu changes, clinicians can bring about positive change both directly, by improving health outcomes, and indirectly, by making it clear that humane, healthful, and sustainable plant-based food practices are important.

A third, related option that clinicians can pursue is public outreach about animal welfare, public health, and the environment. For instance, clinicians can seek to educate the public about the links between human and nonhuman health and welfare by not only discussing these issues with clients but also speaking and writing about them when possible. They can also call for policies to improve outcomes for humans and nonhumans at the same time—particularly policies to reduce the use of animals (such as food system reform) and policies to increase support for animals (such as wildlife and endangered species protections) in ways that benefit humans, too.

Changes Both Within and Beyond the Classroom

Addressing modern global health challenges requires understanding the importance of, and links between, human and nonhuman health and welfare. By including these topics in medical and veterinary education and making related changes in research and food practices, the current generation of clinicians can empower the next generation to do this needed work.

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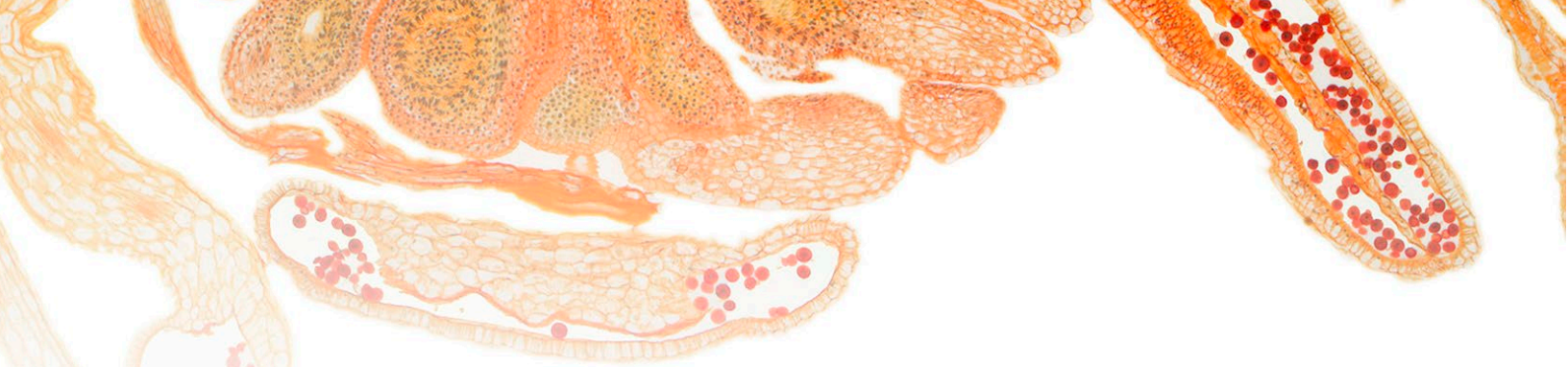

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POLICY FORUM: PEER-REVIEWED ARTICLE

Do Clinics in Meat and Poultry Plants Endanger Workers?

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Abstract

Most meatpacking workers are Black, Latinx, and immigrant workers earning low wages and at high risk for occupational injury. Most meat and poultry plants have on-site workplace clinics (OWCs) where workers are required to obtain care for work-related injuries or illnesses before seeking outside clinical assessment or intervention. Although OWCs can help plant managers identify and mitigate hazards, government and other investigations reveal that OWCs in meatpacking plants not only fail to advocate for safer work conditions, but also nurture conditions that exacerbate injury and illness. This article explores ethical challenges for health care professionals in OWCs, including companies' pressure to keep so-called "recordable" injuries low. This article also suggests changes to support OWCs' roles in safety and injury prevention.

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One Worker's Story

There is no limit to the stories about workers injured in meat and poultry plants.[1,2,3] One of those stories is that of V.L. Griffin Jr who, while working in the blast freezer tunnel at a chicken processing plant, complained of pain and numbness in his right little finger to the plant's on-site workplace clinic (OWC).[4] His symptoms were dismissed by the plant's OWC staff, and he returned to work. Mr Griffin later visited an emergency department on his own accord and was diagnosed with frostbite. The doctor placed him on restrictions of no cold work, no use of his right hand, and sent instructions for the plant to refer him to a specialist. The company did take him out of the blast tunnel but moved him to the "live hang" area, one of the hardest jobs in the plant. While this job normally requires the use of both hands, Mr Griffin tried to work with just his left hand. He repeatedly reported the pain to the OWC staff but was told that he had to wait for management approval before he could see a specialist. When the pain became unbearable, Mr Griffin again, on his own accord, visited the emergency department, where he was diagnosed with gangrene and his finger was amputated. The company did not cover the costs of the treatment since he had not received prior approval. The Occupational Safety and Health Administration (OSHA) subsequently conducted an inspection and cited the

company for failing to provide him with properly insulated gloves. Mr Griffin had to file suit in order to seek compensation for his medical expenses and pain and suffering. In the 49 states in which employers are required to carry workers' compensation insurance,[5] workers give up their right to sue their employer for their injuries in almost all cases, even in cases of negligence, and in exchange the employer is supposed to assume responsibility for providing insurance that covers medical treatment, rehabilitation, and reimbursement for some portion of lost wages. Mr Griffin worked in Texas, the only state that does not require most employers to carry workers' compensation,[6,7] and thus was not covered by workers' compensation.

This story is reflective of what government investigations have consistently found in meat and poultry plants: OWCs endanger injured workers by delaying medical treatment and perpetuate unsafe conditions in the plant rather than mitigate hazards and prevent injuries and illnesses.[2,8,9,10,11,12]

Dangers and Data

Almost 500 000 workers nationwide are employed in the US meat and poultry processing industry. The plants are largely located in rural areas and employ between several hundred and several thousand workers, the overwhelming majority of whom are immigrants, Black, and Latinx.[13] Many are refugees, and dozens of languages are spoken in most plants.[14] Occupational segregation ensures that people of color are disproportionately represented in the most dangerous jobs, such as the meatpacking industry.[15,16] Nearly half of meatpacking workers live in families with low incomes, and about 1 in 8 have incomes below the poverty line. Only 15.5% have health insurance.[17]

The industry ranks among the harshest working environments in US manufacturing.[18,19,20,21,22] In plants across the country, workers stand close together, side by side, in cold, damp, dangerously loud conditions wielding knives and scissors. A typical poultry worker handles dozens of birds per minute.[3,23,24] They make the same forceful cuts or movements thousands of times a day. Annual turnover in these plants averages between 60% and 150%.[25]

According to the US Bureau of Labor Statistics' 2020 data based on the industry's own self-reported statistics, meat and poultry workers sustain serious injuries and illnesses that result in lost time or restricted duty at rates more than triple the average for all private industry.[15] Furthermore, the government has found that these statistics are undercounted.[2] Amputations in poultry workers (which include medical amputations for work-related injuries) were almost 5 times the average for all industries, while meatpacking workers suffered a whopping 14 times as many.[26] Among the tens of thousands of companies that reported severe injuries, such as amputations, to OSHA, several major meat and poultry companies ranked among the highest reporters: Tyson Foods, Pilgrim's Pride, Cargill, and JBS are 5th, 13th, 16th, and 17th, respectively.[1]

Meat and poultry workers were deemed essential workers and continued working throughout the COVID-19 pandemic; counties with slaughtering plants suffered disproportionately high rates of COVID-19 illness and death during the first 6 months of the pandemic.[27,28,29] More workers have died from COVID-19 in the meat and poultry industry than from all work-related causes in the industry in the past 15 years.[28] Congressional hearings in October 2021 and May 2022 exposed how the country's largest meat companies actively endangered workers during the pandemic, lobbying to the highest levels of government to force workers to remain on the job despite

dangerous conditions, and conducted a coordinated campaign that fought against any requirement to implement common-sense mitigation measures.[30,31]

Despite the occupational risks to which they are exposed, meat and poultry workers lack adequate health and safety protections.[3,12] OSHA, the agency that enforces these rights, has been underfunded since it was created in 1971. In 2019, it would have taken OSHA 162 years to inspect every workplace under its jurisdiction just once.[32] In contrast to other workers' rights, workers' compensation bars workers from most private rights of action, such as suing their employers for injuries or treatment.[7,33] Most meatpacking companies provide no paid or unpaid sick leave to workers. Furthermore, many companies have punitive leave systems that assign "points" to workers who are injured or ill and must miss work, even for a work-related injury. Workers who accumulate too many points are fired.[34,35]

On-site Workplace Clinics

OWCs are health units installed in workplaces by employers to provide health care services to employees. In poultry and meatpacking plants, OWCs are usually staffed by licensed practical nurses (LPNs) or emergency medical technicians (EMTs). The employer dictates what health care services are provided and when an employee can be referred off-site to a doctor or emergency room for further medical evaluation and treatment. The LPNs and EMTs follow medical protocols, usually approved by a doctor, but the doctor does not oversee them or evaluate the care provided in the OWCs.[36] All states require that LPNs and EMTs be directly supervised. EMTs must be supervised by a physician and LPNs must be supervised by a physician, a registered nurse, or an advanced practice nurse. Direct supervision means that the clinical supervisor is either on-site or readily available for consultation, reviews all patient encounters, and co-signs all medical records.[37,38] OSHA investigations of meat and poultry plants have found that most OWC staff are not clinically supervised at all.[2,8,9,10,11,12]

Additionally, government investigations have raised concerns about unsupervised OWC staff working outside their scope of practice. Staff frequently gave workers nonsteroidal anti-inflammatory medicines, such as ibuprofen, in quantities that increase the risk of stomach ulcers, kidney injuries, and heart disease. Workers who repeatedly sought help at their OWCs for hand pain, finger pain, and shoulder pain were sent back to the work that caused their symptoms rather than to a doctor. The delay in definitive diagnosis and treatment ultimately resulted in avoidable surgeries for carpal tunnel syndrome, trigger finger, and rotator cuff tendinitis. And workers who suffered medical emergencies, such as head injuries and chemical eye splashes, should have been immediately sent off-site for treatment but were not.[2,8,9,10,11,12]

Workers in the meat and poultry industry are "captive patients" in these clinics and often risk disciplinary action and termination if they seek outside medical care. Companies make it clear that workers must seek care from the OWC for a work-related condition in order for insurance to cover it.[11] Moreover, by not referring workers off-site, companies can keep their recordable injury rates low. OSHA requires companies to maintain a log of serious work-related injuries and illnesses that require more than first aid or that result in lost time or light duty. If a worker is never sent to an off-site doctor and only receives first aid treatment in the OWC, their injury or illness will not be recorded in the log. If a worker goes to their own doctor without company approval, the company claims the injury or illness is not work related, will not record it, and will not cover related expenses. Workers themselves may be intimidated into not reporting work-

related injuries and illnesses for fear of losing their jobs.[2,8,9,10,11,12] With misleadingly low recordable injury rates, the company can claim it is much safer than it truly is.

Multiple Loyalties

The ethical issues that guide health care in the United States (respect for autonomy, beneficence, nonmaleficence, and justice)[39] are ignored by the meat and poultry industry, leading to direct negative effects on workers' health and safety. Many meatpacking workers are immigrant workers, and language barriers exist to their accessing care. OWCs rarely have translation services and sometimes rely on coworkers to interpret, although they often lack the appropriate skills to do so.[34,36] Because of inadequate supervision of OWC staff members, along with employers pressuring them to keep recordable injury rates low, lost employee time at a minimum, and health care costs down, workers are not provided appropriate care and treatment, are not appropriately referred, and suffer worse health outcomes than workers in other private industries. All of these actions lead to a failure to provide safer working conditions, and all violate the ethical duties of health care practitioners (HCPs).

In this adverse work environment, HCPs in OWCs must routinely navigate significant conflicts captured by the concept of dual loyalty, defined as "clinical role conflict between professional duties to a patient and obligations, express or implied, to the interests of a third party such as an employer, an insurer, or the state."[40] Balancing the ethical challenges of multiple loyalties (viz, to the patient-worker, to the client-employer, and to the safety and health of the workforce as a whole) is a daily practice in occupational medicine.[41] A Government Accountability Office (GAO) 2009 study of OSHA's recordkeeping standard found that over one-third of occupational health professionals interviewed reported pressure from employers to keep worker injuries off the OSHA logs by not providing appropriate medical treatment.[42,43] The GAO report also found that "44 percent of health practitioners stated that this pressure had at least a minor impact on whether injuries and illnesses were accurately recorded, and 15 percent reported it had a major impact."[43] The American College of Occupational and Environmental Medicine Code of Ethics states: "Occupational and environmental health professionals have an obligation to ensure ethical conduct regarding conflicts of interest by recognizing, acknowledging, and appropriately addressing any secondary interests that might in reality distort the integrity of judgments or be perceived to do so."[44] Conflicts of interest may be especially difficult to navigate if the HCP is an LPN or EMT, who may have little ability or backing to prioritize patient care over the demands and expectations of the company. Even physicians and advanced practice clinicians, who have greater power and influence, find dual loyalty conflicts challenging.[41,45]

This work environment can also generate moral distress for HCPs, especially when HCPs know the right thing to do "but institutional constraints make it nearly impossible to pursue the right course of action."[46] Power imbalances, limited resources, and unjust institutional practices are all examples of external constraints that HCPs in OWCs confront on a daily basis. Often, HCPs are unable to treat workers, who are their patients, in accordance with the best practices established in their profession, given the conflicts discussed above.

Conclusion

Ramos et al found that Nebraskan meatpacking workers "believed that there was little they could do to prevent and treat health problems" and urged health care workers in meatpacking plants to "foster trust by providing culturally, linguistically, and literacy

appropriate services," along with reducing barriers to care.[34] HCPs in OWCs have an ethical responsibility to work within their scope of practice. Meat and poultry companies that operate OWCs must ensure that OWCs have appropriate staffing, clinical supervision, continuous quality improvement, confidentiality provisions, and all the policies that are required for good health care. Medical consultants to employers have the ethical responsibility to be certain that OWCs are structured and managed to minimize dual loyalty conflicts, provide good care to workers, and improve workplace health and safety.[10,11,36] HCPs should receive workplace safety training, visit the plant floor to observe jobs for which workers report injuries and illnesses, and identify hazardous jobs that must be made safer. OWCs should use the information they have obtained from treating worker injuries to flag dangerous jobs that need safety interventions to mitigate risks. HCPs in OWCs can and should play a significant role in injury prevention.

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MEDICINE AND SOCIETY: PEER-REVIEWED ARTICLE

Should Clinicians Care About How Food Behaviors Express Gender Identity?

Whitney Riley Linsenmeyer, PhD, RD, LD

Abstract

The nutrition care process (NCP) accounts for a person's biological sex characteristics but does not adequately address their gender. Yet dietary choices express one's social identity in ethically and clinically relevant ways. Persons identifying as men tend to eat meat more frequently, consume more meat, and are less likely to be vegetarian than persons identifying as women, for example. Research on transgender persons' diets suggests that food is one means of expressing gender identity; this article argues that an inclusive sex- and gender-informed approach can likely improve the NCP's usefulness to clinicians caring for transgender patients.

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Sex and Gender in Nutrition

Sex and gender are often conflated and reduced to a male-female binary within clinical, research, and administrative settings. However, sex and gender are separate constructs; sex is assigned as male or female based on assessment of genitalia at birth, and gender is one's internal sense of self and place in the world as man, woman, or nonbinary, among other gender identities.[1,2] Both sex and gender have meaningful implications for a person's overall health, nutrition, food choices, and eating behaviors.

The nutrition care process (NCP) is the standardized process by which nutrition practitioners deliver care in 4 steps: assessment, diagnosis, intervention, and monitoring and evaluation.[3,4] Nutrition assessment involves not only an evaluation of patients' food and nutrient intake but also an evaluation of their knowledge, beliefs, attitudes, and food-related behaviors.[5] The NCP utilizes biological sex to inform nutrition assessment with respect to energy needs calculated using predictive energy equations, dietary reference intake values (DRIs), body fat and waist circumference, growth (for children), and complete blood count (ie, hemoglobin, hematocrit, red blood cell count, ferritin levels).[6] Gender, however, is either erroneously conflated with sex or largely unaddressed in the NCP.[1,6] Thus, the NCP is sex informed but rarely gender informed.

Dietary Gender Norms

Gender has meaningful implications for dietary intake when food choices and eating behaviors reflect a core component of a person's social identity.[7,8] Dated and hegemonic gender norms suggest that men hunt, kill, and grill ("real men eat meat"), whereas women shop, cook, and serve.[7,8,9,10,11,12,13] Although these gender norms are oversimplified, existing research supports that men are less likely to be vegetarian than women and tend to consume larger portion sizes of meat, eat meat more frequently, and view meat as an essential part of a proper diet.[7,14,15,16,17,18]

The degree of internalization of gender norms—not limited to male or female gender identity—may also meaningfully influence dietary intake. In particular, red meat intake can enhance one's self-perception of masculinity, especially for those with a higher degree of masculinity stress or feelings of not living up to male gender norms.[18] Hence, among men, greater conformity to traditional male gender roles predicts more frequent beef and chicken intake and lower openness to vegetarianism.[7] Conversely, lower traditional gender role conformity among men is associated with openness to becoming vegetarian for environmental reasons. Among women, greater conformity to traditional gender roles is associated with openness to becoming vegetarian for health reasons.[7]

However, emerging research challenges the "real men eat meat" aphorism. Aavik and Velgan describe the emergence of a "health-conscious masculinity," which values physical and mental well-being among men following a vegan diet.[19] Brady and Ventresca use the language of "renaissance masculinity" in describing the case of a professional football player who publicly adopted a vegan diet and the media coverage that followed.[20] Greenebaum and Dexter suggest that men following a vegan diet engage in "hybrid masculinity" by modifying the values typically associated with veganism and femininity to better align with traditional masculine values.[21] Thus, just as expressions of meat and masculinity are numerous, so, too, are emerging examples that contradict and redefine masculinity with regard to diet.

Food and Transgender Patients

Dietary discourse holds special meaning for the transgender population, for whom sex and gender may differ. For the purposes of this article, the term *transgender* describes a person whose current gender identity is different from the sex they were assigned at birth. The term *nonbinary* describes a transgender or gender-nonconforming person who identifies as neither male or female.[1,2] *Transmasculine* and *transfeminine* describe gender-nonconforming or nonbinary persons based on the directionality of their gender identity that differs from sex assigned at birth; a transmasculine person has a masculine spectrum gender identity with a female sex assigned at birth, and a transfeminine person has a feminine spectrum gender identity with a male sex assigned at birth. A person's *gender expression* refers to how an individual signals their gender to others through appearance, clothing, hairstyle, speech, mannerisms, or behaviors,[1] which may include dietary and eating behaviors.

Questions arise concerning gender norms and diet. Do transgender and nonbinary individuals use food to express their affirmed gender identity? In other words, do transmasculine individuals seek to adopt the dietary gender norms associated with traditional masculinity (ie, eating meat, especially red meat)? Do transfeminine individuals seek to adopt the dietary gender norms associated with traditional femininity (eg, vegetarianism, health consciousness)? How do nonbinary individuals negotiate

existing dietary gender norms? Evidence to address these questions is largely lacking and presents an opportunity for future research.

Relatedly, Nagoshi and Brzuzy encourage clinicians working with the transgender community[22] to identify "source[s] of empowerment," which can be applied to dietary gender norms. Food may be a potential source of empowerment for transgender individuals seeking to express their gender identity through food choices and eating behaviors. For example, the narrative of one transgender man's relation to food throughout his transition revealed specific functions of food and nutrition: support of his physical transition, promotion of his overall health, and a source of self-care.[23] More generally, transgender individuals may adopt eating behaviors that are distinct from nontransgender or cisgender individuals, such as reducing caloric intake to induce pubertal or menstrual suppression or adjusting caloric intake to augment body features that are aligned with one's affirmed gender, although these behaviors might be characterized as disordered when they result in adverse health outcomes.[24,25]

Research

Future research on food choices and eating behaviors as expressions of gender identity should be grounded in relevant clinical and psychosocial considerations and take into account the context of current dietary guidelines.

Hormone therapy and food insecurity. Among those who medically transition, masculinizing and feminizing hormone therapy (HT) typically results in changes in body size and composition, which in turn will affect energy needs.[6,26,27,28] Masculinizing HT in particular may result in increased appetite.[29] Moreover, transgender people are at heightened risk for food insecurity due to poverty, homelessness, and joblessness and may face transgender-specific barriers to accessing food assistance resources, such as gender-based discrimination or needing to use an identification card with a name, gender marker, or photo that doesn't match their current gender expression.[30,31] Therefore, future research on food and eating behaviors as an expression of one's gender identity or as a source of empowerment must take into account the metabolic effects of HT and the nutrition-related health disparities that impact the transgender population.

Dietary guidelines. The US Department of Agriculture 2020-2025 Dietary Guidelines for Americans recommend limiting saturated fat and sodium intake—2 nutrients found in relatively high levels in red and processed meats (eg, beef, bacon)—and encourage intake of protein sources from a mix of animal- and plant-based foods.[32] The United Nations 2019 report on climate change not only recommends reducing meat consumption but also frames plant-based diets as an approach to mitigating climate change.[33] Research and dialogue on reducing meat intake for health and environmental purposes, however, largely explore strategies to decrease *men's* meat intake.[7,8,11,12,13,14,15,16,17,18] Overlooked is how transgender and nonbinary individuals reconcile dietary gender norms with health and environment-driven recommendations to consume less meat. Does discouraging meat intake disempower transmasculine individuals from using traditionally masculine food choices to express their gender identity?

Inclusion and NCP Usefulness

Nutrition practitioners can improve the accuracy of nutrition assessment and the inclusiveness of the NCP by taking a sex- and gender-informed approach that includes the following steps.

Acknowledge sex and gender as separate and relevant constructs. Collection of both sex and gender identity information during a clinical intake will improve the accuracy of a patient's demographic data. The National Academies of Science, Engineering, and Medicine recommends a 2-step method to query patients about their sex and gender[1]:

1. "What sex were you assigned at birth, on your original birth certificate?
   - Female
   - Male

   (Don't know)
   (Prefer not to answer)"

2. "What is your current gender? [Mark only one]
   - Female
   - Male
   - Transgender
   - [If respondent is AIAN [American Indian or Alaska Native]]: Two-Spirit
   - I use a different term: [free text]

   (Don't know)
   (Prefer not to answer)"

Use of transgender response options improves the inclusiveness of the NCP by inviting patients to share their authentic gender identity (vs selecting from male-female response options only). Collection of gender identity data may foster further dialogue regarding the patient's food choices and eating behaviors.

Recognize gender as a fluid (rather than binary) concept. Conceptualization of gender as a fluid and dynamic element of a patient's identity not only can ensure that transgender and nonbinary identities are included in the NCP, but also might help to liberate all patients (including cisgender individuals) from the constraints of perceived dietary gender norms. Conversely, failure to recognize gender as a fluid concept may perpetuate dietary gender norms and resulting masculinity stress ("real men eat meat.")[18]

Seek to empower patients by encouraging food and eating behaviors that express their gender identity. Gender is both socially and self-constructed[22]; nutrition practitioners can help their patients explore having power and control over their own lives by defining for themselves what food means in the context of their gender identity.

Conclusion

Although sex and gender have meaningful implications for a patient's health and nutrition, sex informs multiple elements of the NCP but gender is rarely considered. Yet food and eating behaviors are, in part, an expression of a patient's gender identity and may reflect internalized dietary gender norms concerning meat intake, vegetarianism, or veganism. The flawed conflation of sex and gender in the NCP compromises the accuracy of nutrition assessment and contributes to the erasure of transgender identities when sex and gender are reduced to a male-female binary. A sex- and gender-

informed approach to the NCP has the potential to improve its accuracy and inclusiveness, liberate patients from destructive dietary gender norms, and harness food and eating behaviors as a source of empowerment.

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ART OF MEDICINE

Greener Health Care Is a Necessity

Brian Robert Smith

Abstract
This series of 4 images visually considers ethical questions about the US health sector's emissions.

Figure 1. *Smokestacks*

Media
Affinity Designer iterated through the artificial intelligence (AI) art program Midjourney, with custom parameter weighting.

Caption
This drawing explores the dissonance between a hospital's healing capacity and its emissions' environmental harms. Air pollution threatens patients' health in a variety of ways, including by exacerbating respiratory and cardiovascular illness and increasing spread of infectious diseases.[1]

Figure 2. *Landfill*

Media
Affinity Designer iterated through the AI art program Midjourney, with custom parameter weighting.

Caption
Mountains of plastic represent one environmental harm of the US health sector. Vast amounts of waste, especially single-use plastics, suggest the importance of finding sustainable alternatives.

Figure 3. *Drought*

Media

Affinity Designer iterated through the AI art program Midjourney, with custom parameter weighting.

Caption

Dystopian consequences of the Anthropocene are represented here by first responders,[2] on whom we rely when facing emergencies and who have limited capacity as individuals for the collective response needed to mitigate climate change, which is annually causing millions of deaths worldwide.[3] In this bleak landscape, those tasked with saving lives are also stranded.

Figure 4. *Reclaimed*

Media

Affinity Designer iterated through the AI art program Midjourney, with custom parameter weighting.

Caption

An operating room overrun with lush vegetation represents hope for a more sustainable, "greener" approach to health care. Plants' reclamation of a once sterile, artificial place prompt a reimagining of spaces designated for health and well-being.

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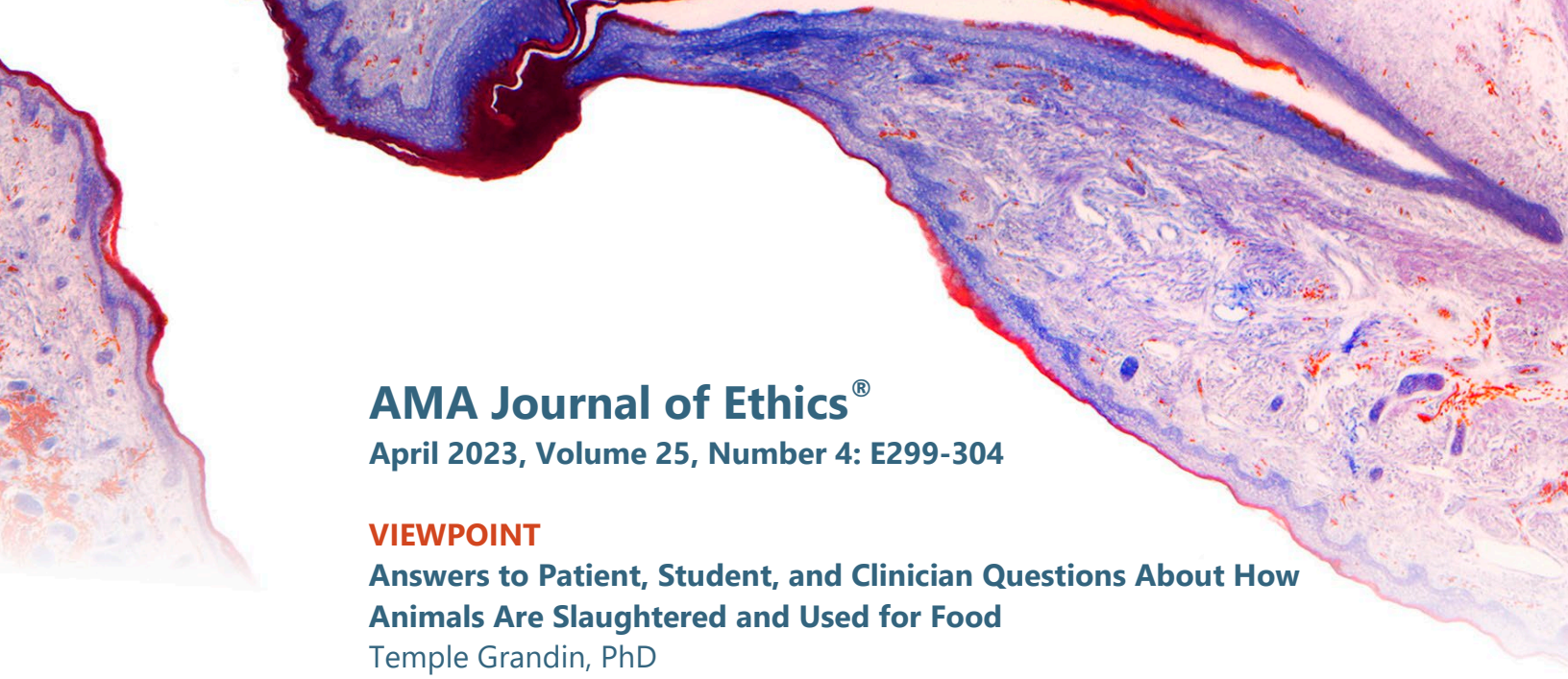

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VIEWPOINT

Answers to Patient, Student, and Clinician Questions About How Animals Are Slaughtered and Used for Food

Temple Grandin, PhD

Abstract

"Do cattle and other animals know they are walking up a chute that will lead to their death?" Many people ask this question, which the author first had to answer when starting work in the cattle industry. From observations at slaughter plants, feedlots, and ranches, the author learned that cattle behavior was the same when entering a chute for vaccination and when entering a chute for slaughter. If cattle knew they would die, their behavior should have been wilder and more agitated at the slaughter plant, but that was clearly not the case. This article canvasses points of ethical and clinical relevance for discussions about human dietary consumption and practice.

Animals React to Slaughter

Do animals know they are going to be slaughtered? Scientific research has clearly shown that physiological measures of stress during handling are similar at a ranch and at a slaughter plant. Cortisol (stress hormone) levels were in the same range in both places.[1,2,3] If the cattle, for example, knew they were going to die, the stress hormone levels should have been much higher at the slaughter plant.

The things that frighten cattle are definitely not the same things that frighten people. Cattle and pigs will often stop and refuse to move through a chute if they see little visual distractions that people do not notice. The distractions might be a coat hung on a fence, sharp shadows from fences that create stripes on the floor, or a dangling chain.[4,5] When the visual distractions are removed, the animals will often move more easily through the chute. Animals are also more likely to refuse to move into a chute that has a dark entrance. The addition of a lamp to illuminate a dark entrance will often make cattle and pigs more willing to enter.[6,7]

At a recent start-up at a new plant, the cattle moved easily through the chute during the daytime, but they often stopped and refused to move forward in the evening. I told the people at this plant to watch the cattle very carefully and observe when they stopped in the system. Cattle and other animals will often stop and look at visual distractions. When we conferenced each other by video call, I observed that a small bright light on the corner of the building caused the problem. Turning the light off improved cattle

movement. The cattle were more afraid of a visual distraction than of getting slaughtered. We owe the animals that we use for food a low-stress, good death.

Methods for Rendering Livestock Unconscious

To comply with the Humane Methods of Slaughter Act,[8] cattle and other animals must be rendered insensible to pain before they are further processed. To maintain a high standard for obtaining instantaneous insensibility requires management commitment to doing things right. For cattle, the most common method is penetrating captive bolt stunning. When it is done correctly, it is equivalent to shooting an animal with a high-powered firearm. Unconsciousness and insensibility are instantaneous when it is done right.[9,10,11] The device is called a captive bolt because the bolt is not a free projectile that would cause a safety hazard. However, supervision and training of employees and daily maintenance of the captive bolt tool are essential. Poor maintenance is a major cause of problems, as animals might wake up and return to sensibility. After stunning, an animal might still continue to kick. This behavior can occur in an animal that is completely brain dead. Kicking can still occur after the spinal cord is cut because the circuits that control kicking are in the middle of the animal's back.[12,13]

There are 2 other approved methods of rendering animals insensible prior to slaughter: electric stunning and carbon dioxide gas for pigs and poultry. When electric stunning is used on pigs or sheep, an electric current is passed through the brain. When it is done correctly, the animal is instantly rendered insensible by the induction of grand mal seizures.[14,15] Management must be really attentive to ensure that the stunning device is placed in the correct location on the animal's head so that the electric current passes through the brain.[16] Both electric stunning and captive bolt induce instantaneous unconsciousness.

When carbon dioxide gas stunning is used, the induction of insensibility is not instantaneous. To ensure good animal welfare, the behavior of the animal before it loses consciousness and falls down (loss of posture) must be observed. For poultry, carbon dioxide stunning has huge welfare advantages. Many companies are converting to this system because it improves bird welfare. The birds enter the chamber in the same containers they are transported in. This eliminates stressful handling at the slaughter plant. In older electrical stunning systems, the birds are hung live on the conveyor line to present them to an electric water bath. Hanging live birds on the line is very stressful for the birds.[17] In modern carbon dioxide stunning systems for poultry, a staged process is used. The travel containers holding the birds progress through a tunnel with gradually increasing levels of carbon dioxide. The birds seldom flap. Wing flapping in conscious birds is a sign of distress. The anesthetic induction process is relatively low stress.[18] The process *must* be continuously monitored to ensure good animal welfare. If the birds flap before loss of consciousness, the carbon dioxide levels will need adjustment.

For pigs, carbon dioxide stunning has become controversial. The handling of the pigs is calm and excellent because they are moved in groups. The use of electric prods to move pigs into a carbon dioxide stunner can be totally eliminated because they are handled in groups. There is a species difference between pigs and chickens, however, in how they react to carbon dioxide. Whereas almost all the chickens remain calm, some pigs have a violent reaction and may attempt to escape from the containers that lower them into high concentrations of carbon dioxide. Other pigs remain calm.[19] These differences between pigs may be due to differences in genetics.[19,20] The problem might be correctable with selective breeding. The entire system of rendering animals insensible

before slaughter must be evaluated, however. When either electric stunning or captive bolt is used in a large plant, the pigs have to move through a single-file chute. This will require the use of an electric prod on about 15% of the pigs. The trade-off between discomfort during anesthetic induction must be balanced against the benefits of eliminating electric prods for moving groups of pigs.

Religious Slaughter

In religious slaughter, cattle, lambs, and poultry are slaughtered by a throat cut with no preslaughter stunning to first render them unconscious. In the United States, federal law permits this process to ensure religious freedom for Jewish kosher slaughter and Muslim Halal slaughter.[8] I have discussed this issue in detail with my colleague, Joe Regenstein.[21] There are some religious scholars who will accept preslaughter stunning.[22]

Three animal welfare issues arise when slaughter is done without prelaughter stunning: (1) restraint of the animal, (2) painfulness of the throat cut, and (3) time to lose consciousness. The author has observed that some of the worst animal welfare issues are caused by highly stressful methods of restraint, such as suspending cattle or sheep by one back leg, which are legal. I and my colleague Regenstein have discussed the design of less stressful restraining methods.[21] Less stressful methods include restraint boxes to hold the animal. Many kosher and halal slaughter plants have voluntarily stopped suspending animals by one hind leg. To conduct slaughter without first stunning with an acceptable level of animal welfare requires much more attention to details of correct procedures than conventional slaughter with stunning.

An Animal's Whole Life and Death

It is my opinion that some of the most severe welfare issues are chronic painful conditions that may occur on poorly managed farms. For example, there are a large number of lame dairy cows on some farms, although there are big differences between the percentage of lame dairy cows on the best and the worst dairies.[23] Lameness is a condition that causes pain[24] and reduces the quality of life for a dairy cow. Both good facilities and management attention can greatly reduce lameness. Some of the methods to reduce lameness are soft, clean bedding in each cow's stall and quiet, gentle handling.

Often people are more concerned about death than about the animal's entire life on the farm. A big concern of mine is excessive genetic selection for production traits that may compromise an animal's welfare on the farm. Overselection for meat, milk, or eggs can sometimes cause problems, such as a sow producing more piglets than she can feed or heart failure in cattle.[25,26] I call these problems *biological system overload*.

Other welfare concerns on the farm are intensive confinement of sows and laying hens.[27,28] It is beyond the scope of this paper to discuss all the issues. Welfare specialists agree that, on the farm, suffering must be prevented but animals should also be given some opportunities to have a life worth living.[29] There is increasing emphasis on providing animals with opportunities to have positive experiences. If you look up videos of dairy cows using motorized grooming brushes, for example, it is obvious that they really like them.[30]

Farm animals are not the only animals for which overselection for certain traits has caused welfare problems. The bulldog is a prime example of excessive selective

breeding for appearance that severely compromised its welfare. Selection for a massive head and a shortened snout has resulted in problems with breathing and mobility, and almost all the puppies have to be delivered by cesarean section. In fact, the bulldog has greater welfare problems caused by overselection for extreme appearance traits than most farm animals.

Another issue is the effect of raising livestock on the environment. Grazing cattle, sheep, or goats on pasture can improve soil health and regenerate the land.[31] There are vast amounts of land where grazing is the only way to raise food on the land, because it is too arid for raising crops.[31] Grazing done correctly is truly sustainable, and the animals often have improved welfare. An upshot is that when clinicians make dietary recommendations to patients, they need to realize that a sensible view about animal welfare is a middle ground among many extremist views.

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Dr Grandin reports doing paid consulting work on animal handling and welfare for major meat companies and restaurants.

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