Diet for a Better World: Exploring the Intersectional Impact of Meat-Based vs Plant-Based Diets and First Steps for Change

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ABSTRACT

Humanity is faced with numerous pressing issues from the health crisis and human rights violations to climate change and animal cruelty. Although various methods are being employed to solve these issues, dietary changes are often overlooked. Unbeknownst to many people, the meat, dairy and fish industries continue to play a substantial role in perpetuating environmental degradation, animal cruelty, and human rights issues. However, the adoption of a 'plant-based' or 'vegan' diet emerges as a powerful catalyst for yielding widespread change in these issues. This research paper aims to explore the importance of transitioning society away from animal-based diets and towards plant based meals. Addressing a spectrum of urgent issues, this paper underscores the often underestimated potential of transitioning to plant-based diets as a potential solution to human, animal and environmental issues. The paper commences with a meta-analysis, employing an intersectional lens of human ethics, animal ethics, environmental concerns, and health perspectives, to evaluate the negative repercussions of animal agriculture industries. Perceived negatives of plant-based diets will then be explored to holistically conceptualize whether veganism is a valid and feasible option for individual and societal change. Lastly, drawing from prior studies and acknowledging the barriers of transitioning to a plant-based lifestyle, the paper culminates in proposing first steps for creating a successful plant-based transition: the implementation of plant-based meals and education in schools.

Introduction

The Earth seems to be in an alarming state as stories of environmental destruction, inequality, global hunger, social injustices and animal cruelty flood the news. It may be too overwhelming for individuals to try to tackle these issues, especially with the busyness of their personal lives. They may not have the time to volunteer or campaign for change, the money to donate to these causes, or they may even feel like their actions will not make a big enough difference and thus no action seems worth taking. However, studies have shown that dietary change can play an integral role in tackling a myriad of human, environment and animal issues all in one. By adopting an animal-based diet, consumers are funding the harmful working conditions of slaughterhouse workers, intergenerational injustice, environmental racism, climate change, animal cruelty, food insecurity and global chronic illness. Simply transitioning to a plant-based diet is a small daily action with immense power to solve animal agriculture-related issues. Through individual, institutional and societal plant-based transition, we can create a better world. Before beginning, it is integral to define the key terms that will be utilized throughout this paper. ‘Animal-derived’ or ‘animal-based diets’ refers to the consumption of meat, dairy, gelatin and honey products amongst other things, all of which come from some degree of animal exploitation. Alternatively, ‘plant-based’ and ‘vegan’ diets will be used interchangeably throughout the paper to refer to diets that exclude animal-derived products such as grains, fruits, vegetables, nuts and other processed alternatives. Lastly, ‘whole foods’ refers to foods that are not processed or refined. There are currently no papers thoroughly detailing the intersectional impact of meat-based vs plant-based diets, thus this paper aims to fill that gap. This paper explores research around the detrimental effects of animal agriculture, and analyzes the subsequent need of a

plant-based transition. Examining the barriers and misconceptions of plant-based diets, we can evaluate the plausibility and validity of this dietary change. Lastly, a first step towards change is proposed, given the positives and negatives identified of the diets.

The Intersectional Impact of the Animal Agriculture vs. the Plant-Based Industry

Animal Cruelty

The Maltreatment of Animals in Factory Farms

Today more than 70 billion land animals are slaughtered in the meat and dairy industry annually and 1-2.7 trillion marine animals are killed in commercial fishing and aquafarm industries (Ritchie et al.,2017; Mood, 2010, as cited in Brown & Dorey 2019). With the progress of industrialization, the majority of the population have become disconnected to animal agriculture and the animals have become commodified (Marie, 2006). Around 50 billion of the 70 billion farmed animals are mass bred in factory farms characterized by confined, densely populated environments called Concentrated Animal Feeding Operations (CAFO) (World Animal Protection, 2021). Factory farms typically share common practices for livestock management to ensure sufficient quantity and quality, efficiency, cost-effectiveness and standardization.

According to The Humane League (2021), cow management and slaughter is a particularly gruesome, inhumane process. Female cows are artificially inseminated to give birth once per year for continuous milk production. Unlike the grass pastures commonly associated with raising ruminants, cows are typically raised in tie stalls where their necks are tethered to the stalls to restrict movement, with exception to their walks to and from their milking parlors. Once their milk yield is insufficient (usually at around 3-4 years of age), they are slaughtered for meat or leather products, cutting their natural 20-year lifespan short. The calves that are born are forcibly taken from their mothers an hour after birth to another facility and fed milk substitutes while their mothers' milk is sold for human consumption. After a few months, they may undergo physical mutilations without painkillers including dehorning, branding, castration and/or tail docking. Like their mothers, female calves are bred for the dairy industry whereas male calves are either killed instantly, raised for veal or raised for beef. When cows are ready to be slaughtered they are transported to slaughterhouses or 'abattoirs' where they are confined in crowded, sometimes poorly ventilated trucks for long periods of time. The hunger, thirst, stress, exhaustion and confusion experienced by cows causes thousands of cows to die during transport (Simova et. al., 2016). Upon arrival, the surviving cows are stunned in the head with captive bolt guns to render them unconscious. They are then hung upside down on a moving pulley where their throats are slit, severing major blood vessels to induce death- a process called exsanguination. Sometimes the stunning process doesn't work or the interval between slaughter and stunning is so long that the cows gain consciousness, causing them to experience immense suffering as their throats are slit. The pulley will then drag their bodies to a dismemberment station where their bodies are cut up, their organs are removed and they are skinned. At this stage cows may also still be conscious from ineffective stunning and exsanguination, causing more pain. The dismembered body parts are then washed and packaged for sale at restaurants and grocery stores (Encyclopædia Britannica, 2022; Encyclopedia.com, 2023; Sinergia Animal, 2022; The Humane League, 2021).

According to the book 'Animal Liberation Now' by Peter Singer (2023) as well as exposees from PETA (2023) and The Humane League (2021a), chicken management on factory farms is also unethical. Chicken management involves genetic selection to ensure broiler chickens rapidly grow to almost 4x their regular size. Their legs and organs usually cannot handle the weight gain, leading to leg deformities, heart attacks and ascites. Surviving chickens are either raised in small, stacked battery cages or massive, windowless sheds alongside about ten thousand other densely packed chickens. Nature deprivation and extreme confinement induces psychological trauma and physical issues (i.e. osteoporosis) in the chickens since they are naturally accustomed to living in forests and running great

distances to explore, forage or dust bathe.The boredom, chronic stress and frustration induced from an inability to move and being so close to other chickens without established dominance hierarchies, can lead to psychosis and aggressive behavior such as toe picking, feather picking, and tail picking. The painful process of 'debeaking' or 'beak conditioning' without painkillers, is employed to tackle this telling symptom rather than addressing the root cause. Breeder chickens who give birth to the billions of broiler chickens also endure the same living conditions with perpetual, dim, artificial lighting to mimic the spring season which is synced to hens' natural laying cycle. This 18-hour long, daily light manipulation tricks the birds' bodies into producing more eggs. After about 1-2 years, these breeder chickens are sent to slaughter because they are too frail and exhausted to lay eggs, whereas broiler chickens are typically killed after only 42 days and male chicks are ground up alive immediately after birth. Live-shackle slaughter is the most commonly employed when chickens are ready for slaughter. This method begins with chickens being held upside down by metal shackles around their legs, many of which suffer from painful or broken joints as they struggle to hold their unnaturally heavy body weight. A pulley moves them through stunning or electrocution followed by mechanized blades slitting their throats and defeathering in scalding water. Similar to cows, chickens may still be conscious after stunning and/or throat slashing causing immense suffering through the process. Gas killing is considered a more ethical alternative that is used by exposing the chickens to lethal gasses before defeathering and dismembering (Singer, 2023; PETA, 2023; Encyclopedia.com, 2023; The Humane League, 2021a).

Similar to other livestock, pigs are also confined in densely populated, confined areas which cause overwhelming stress and boredom. This causes the pigs to painfully bite nearby pigs and even resort to cannibalism, eliciting farmers to clip piglets' teeth and cut their tails, without any painkillers (The Humane League, 2020). When pigs are ready for slaughter they are transported in tightly packed trucks without food, with unregulated temperatures and often ammonia-contaminated air. More than 1 million pigs die during transportation each year due to the truck conditions and the overwhelming fatigue, fear and stress induced (Faucitano et al., 2018). Upon arrival, the process commonly begins with electrically stunning the pigs, similar to cows, or forcing them into gas chambers to render them unconscious. Gas chambers are typically filled with high concentrations of carbon dioxide which is painful to inhale causing acute respiratory distress and gradually inducing unconsciousness. The pigs who may or may not still be conscious get their throats slit to die in the exsanguination process. To loosen their hairs, their bodies are either placed into scalding water or resin, or their hair is scraped with a knife or gas torch. The pigs' bodies are then split down their spine, their organs are removed and their body is cut up for human consumption (Schweihofer, 2014; Encyclopedia.com, 2023).

Fish, crustaceans, mollusks and other sea creatures are either acquired from commercial fishing or aquaculture. According to PETA (2010b) commercial fishing uses various harmful fishing methods including longlines, bottom trawlers, gill nets and purse seines. Longlining is a widespread practice where miles of line with hundreds of thousands of baited hooks are unreeled into the ocean to lure in animals. Many fish that get hooked may suffer from damage to their gills causing them to suffocate or bleed to death while others struggle for hours until they are reeled in by the boat. Larger fish that are difficult to reel in are stabbed with pickaxes into their fins, sides or eyes to pull them aboard. Bottom trawlers are 40 to 60 feet long nets that drag across the ocean floor to capture target species such as ground fish and crustaceans. However, this is a very destructive practice that destroys the benthic floor and captures thousands of pounds of bycatch. When the filled net is pulled out of the water, the more than 500 tons of fish are compressed by the weight causing organ ruptures and popped eyes. Gill nets are weighted, vertical nets that create an inconspicuous wall where fish get stuck in. As they struggle to get out, their gills or fins may get cut causing them to suffocate or bleed to death. After a span of hours or days, the net is pulled on deck. The extreme pressure change causes deep sea fish to suffer from decompression, bulging eyes and/or organs being forced out of their mouths. The fish that are still alive aboard the ship either suffocate after being manually ripped out of the nets or cut alive. Purse seines are cinching nets that intend to trap tuna but have also killed over 7 million dolphins, pushing them to endangerment. Similar to gill nets, the fish can also suffer from injuries, decompression and suffocation throughout the process (Encyclopædia Britannica, 2023; PETA, 2023a; PETA, 2010b).

As nearly 50% of global fish stocks are depleting and technology improves, there has been a shift away from commercial fishing practices and towards the equally harmful aquaculture practices. Similar to the CAFOs in animal agriculture, aquaculture breeds thousands to millions of fish in confined tanks or netted enclosures (PETA, 2010). Oftentimes hormones and lighting are used to manipulate reproduction, genetic engineering is employed to accelerate growth, and/or antibiotics are laced into feed to fight diseases. Confinement is unnatural to fish who have adapted to swim far distances but are instead knocking into other fish and the nets, causing sores, deformities and stress-related injuries. Many fish are found to also suffer from hearing or vision loss. Aquaculture and wild fish are typically killed through asphyxiation when pulled out of the water, carbon dioxide exposure, exsanguination from being cut alive, and low temperature exposure. Sometimes electrical or percussive stunning precedes slaughter to make it more 'humane' (Robb et al., 2023).

The intensive confinement that is standard of all factory farming and aquaculture also often breeds diseases and illnesses. According to the World Organization for Animal Health, as of 2020, 117 transmissible illnesses were identified in factory farm animals worldwide including African swine fever, Bovine Spongiform Encephalopathy ("mad cow" disease), pneumo-virus, Porcine Circovirus 2, Porcine Reproduction and Respiratory Syndrome, Foot-and-mouth Disease, Porcine Epidemic Diarrhea Virus, and Highly Pathogenic Avian Influenza (World Organization for Animal Health, 2023). There have also been over 100 identified aquaculture parasitic infestations, infections, bacterial diseases and mycotic diseases globally, some of which also spread to wildlife populations in the oceans. These densely populated confines are often unsanitary from excrement contamination, chemically laced feed and high concentrations of ammonia and nitrates induced from the lack of beneficial water bacteria. These widespread illnesses spurred from farming conditions cause millions of aquatic and land animals to suffer and die.

The Philosophy of the Human-Animal Relationship and Justifying Immorality

From a rational perspective, the treatment and slaughter of aquatic and land animals for food is not only harmful but also unnecessary (Webster, 1994) as humans have the technology to create plant-based alternatives. However, despite the issues that animals endure in the meat, dairy and fish industries, society possesses varying magnitudes of justification for the treatment of animals and diverse philosophical positions on animal ethics throughout history. According Hölker et. al. (2019), the spectrum of animal-ethical positions in philosophy ranges from the original anthropocentrism extreme to the abolitionist extreme as displayed in Figure 1. Original anthropocentrism states that humans are the sole entities possessing moral status and thus everything is a commodity valued only by what they provide to humans. Therefore the exploitation and killing of animals is justified and animal welfare mustn't be considered. Anthropocentrism with indirect duties is a philosophical extension that states animals can be exploited without intentional cruelty to not reinforce human violence. Relationism grants moral status to animals that are closest to humans such as domesticated species, which is the core of society's fundamental speciesism. Utilitarianism considers the positives and negatives of actions towards humans and animals in pursuit of the greater good. Contemporary contractarianism is a mutually beneficial 'contract' of sorts that permits animal slaughter so long as the animals live 'a good life'. The animal rights or welfare position is rooted in the idea that all sentient beings have moral status and inherently deserve proper treatment. Lastly, abolitionism is an animal rights extreme where animals' moral status grants them the right to not be exploited or killed at all by humans (Hölker et. al., 2019).

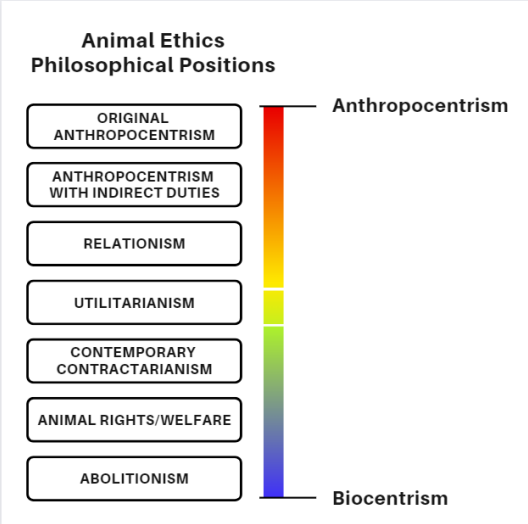

Figure 1: Spectrum of Philosophical Positions Around Human-Animal Relationship

The positions held by individuals vary widely based on culture, age, sex and residence, but trends generally show a linear progression through the philosophical spectrum through history. Earlier philosophical positions that did not attribute moral status to animals were adopted because of the anthropocentric tendency to compare animals against human abilities. Maltreatment could be justified by the fact that animal perceptions, sensations and comprehension are relatively insignificant or unrecognizable against human benchmarks. However, in modern society, biocentric extreme positions of animal rights and abolitionism have been reported to be the most commonly shared due to the widespread recognition of animal sentience. Studies show that animals have the capacity for positive and negative sensory and emotional experiences like happiness, pleasure, hunger, fear and pain. Many farmed animals also have more complex cognitive processes such as life quality expectations and feelings of deprivation induced from frustration (Webster, 1994) . Unlike anthropocentric views, biocentrism recognizes that animals also have intrinsic value rather than just instrumental and relational value. The sentience and intrinsic value of animals warrants their moral status and thus their right to ethical treatment.

The internationally accepted mental and physical welfare standards of animals are defined by the 'Five Freedoms' which includes freedom from hunger, thirst, pain, injury, disease, discomfort, and distress as well as freedom of behavioral expression through the provision of proper, spacious environments mimicking their natural habitats (Webster, 1994). Given that welfarism is considered morally correct by a great majority of the population, it is unethical that animals in the meat, dairy and fish industries are deprived of these freedoms. Moreover, by the ethical rationality of welfarism, an abolitionist stance should be adopted to truly ensure animals are fairly treated without infliction of harm. There is no foolproof method for truly painless slaughter and even the concept of humane (as in causing minimal or no harm to welfare) slaughter is an intangible oxymoron as depriving animals of future positive experiences and experiencing suffering at the end of life is harmful (Browning, 2020)**.** Ethical treatment of animals is thus giving them the freedom to live by stopping the supply and demand of meat, dairy and fish. Therefore, a plant-based lifestyle is more ethical than an omnivorous diet as it prevents the unnecessary torture and death of animals for human pleasure.

Sustainability, Environmental Degradation, and Climate Change

Animal consumption and production also have detrimental impacts on the environment including water waste and pollution (i.e., acidification and eutrophication), greenhouse gas emissions (GHGEs), deforestation for land use, soil degradation, and fertilizer and pesticide use (Magkos et al., 2020, as cited in Espinosa-Marrón et al., 2022). Animal

agriculture practices exacerbate water issues including aquifer depletion, loss of wetlands, waterlogging of soils, and surface and groundwater pollution. About 59% of ice-free land on Earth has been cleared for animal agriculture, causing habitat loss, soil degradation, loss of carbon sinks and biodiversity loss (FAO, 2012). In fact, almost 44% of land deterioration is caused by feed crop production and aquaculture operations in the meat and fish industries alone (Espinosa-Marrón et al., 2022; Davis et al., 2016; Rosi et al., 2017; Froehlich et al., 2018).

The animal agriculture industry is also responsible for 7.1 gigatons of GHGEs per year which is 14.5% of global anthropogenic GHGEs including methane, carbon dioxide and nitrous oxides (FAO, 2013). The major sources of these emissions are feed crop production including non-renewable energy use, synthetic fertilizer production and soil degradation, livestock rearing including enteric fermentation and manure management, as well as carbon sink removal for land use. These GHGEs from the animal agriculture industry play a central role in exacerbating climate change, which subsequently leads to natural disasters, habitat loss, biodiversity loss, droughts, floods, food scarcity, insect outbreaks and more (Espinosa-Marrón et al., 2022).

Plant based diets have the lowest ecological footprints relative to other diets, especially when the foods are locally and sustainably sourced. Studies have also estimated that a global transition to a vegan diet can reduce 17% of carbon dioxide emissions, 21% of nitrous oxide emissions, 24% of methane emissions, 50-80% of land-use impacts, 14.4% of freshwater waste, and 20.8% of groundwater waste compared to an omnivorous diet (Scarborough et al., 2014; Jalava et al., 2014; Kustar et al., 2021; Chai et al., 2019). In fact, plant-based diets are one of the highest impact actions that an individual can take to stop climate change and save the environment (Wynes et al., 2017) .

Chronic Health & Skin Care

Studies have shown that omnivorous diets contribute to multiple health issues whereas plant based diets can actually improve health. In comparison to people with vegan diets, omnivorous people have increased risks of strokes and developing numerous chronic diseases including cardiovascular disease, diabetes, obesity, hypertension and cancer (Clem & Barthel, 2021; Mangels et al., 1994; Dwyer, 1988; Snowdon, 1988). Red meat and processed meat are carcinogens that increase consumers' risk of colorectal, esophageal, liver and lung cancers (Cross et al., 2007; Craig, 2009). Egg consumption is correlated with increased risks for colon, rectal and pancreatic cancer (Steinmetz et al., 1994, as cited in Craig, 2009). Additionally, high dairy consumption in childhood has been associated with colorectal cancer. Vegans remove these animal-based carcinogens from their diets and often consume more legumes, allium vegetables, fiber, flavonoids, carotenoids, vitamin C and other phytochemicals that protect against various cancers. Plant-based diets are also higher in folic acid, polyphenols, vitamin E, poly-unsaturated fat and iron, while having less sodium, calories, cholesterol and saturated fats (Craig, 2009; Clarys et al., 2014; Espinosa-Marrón et al., 2022). Furthermore, whole-food, plant-based diets have been found to prevent skin aging due to the high intake of essential vitamins, low geronototoxins in the bloodstream and lengthened telomeres (Solway et al., 2020). It can help improve skin firmness, elasticity and depigmentation, prevent photodamage and facial wrinkles, as well as control or reduce inflammatory skin diseases such as acne, atopic dermatitis and psoriasis (Flores-Balderas et al., 2023). The World Health Organization, Academy of Nutrition & Dietetics, and numerous dietary guidelines have indicated that plant based diets are the healthiest dietary options to improve health and decrease mortality rates globally (Pahlen, 2019; Clarys et al., 2014).

Human Ethics

Disproportionate Effects on Low-Income Nations, Minorities and Future Generations

The animal agriculture industries also have disproportionate impacts on low income nations, minorities and future generations through health inequity, food insecurity, water waste, environmental racism and intergenerational injustice. Over 800 million people across the world suffer from chronic food deprivation every day and 1 in 3 people

globally don't have access to clean drinking water (WHO, 2019). Meat production is an expensive and inefficient use of the limited water and food resources in the world that can solve these crises. According to a PNAS study, if land used for raising livestock in the US alone was instead used for plant-based food, it could feed 2x more people than today, which is 390 million malnourished people (Shepon et al., 2018). In fact, research published in *Elementa: Science of the Anthropocene* states that current crop production is enough food to feed the projected 9.7 billion person population of 2050 only if meat and dairy are replaced with plant-based alternatives and edible crops fed to livestock are directly consumed by humans (Berners-Lee et al., 2018). A report from the Institution of Mechanical Engineers also states that it requires 5000 to 20, 000 liters of water to produce 1kg of meat whereas it takes only 500 to 4000 liters of water to produce 1 kg of wheat (Institution of Mechanical Engineers, 2013). By utilizing the land, water and crops needed to raise livestock to, instead, produce plant-based products, we can feed the malnourished and supply more clean drinking water to those in need.

Factory farms are often built near low-income communities, with predominantly People of Color who suffer the consequences of the water and air pollution. These are issues of environmental racism as studies have argued that companies may intentionally target these communities because they perceive them as having less political and economic power to oppose factory farms (Nicole, 2013; Mohai et al., 2009). Low socioeconomic status communities also often live in 'food deserts' with very limited affordable, nutritious, plant-based foods and more processed animal products (Greenebaum, 2018). This dramatically increases risks of contracting chronic illnesses and thus increases need for healthcare. Additionally, this could harm residents' mental and physical health to the point that it interferes with their labour productivity, risking their limited income (Katcher, 2010). On a global scale, as mentioned, factory farms are a leading contributor to climate change, which disproportionately harms developing nations and the lives of future generations due to their increased geographic vulnerability and limited adaptive or mitigation capacity. Developing nations and future generations can suffer from heat waves, floods, droughts, wildfires, rising sea levels, disease, insect outbreaks, famine, poverty and poor air quality (United Nations, n.d.).

Slaughterhouse Working Conditions

Employees at factory farms endure harmful workplace conditions that can negatively affect their physical health. Slaughterhouses involve physically dangerous, health hazardous, repetitive, labour intensive and demanding work that has caused high injury-on-duty and employee turnover rates. Workers are expected to use sharp knives or mechanized tools (without much equipment safety training) to repetitively cut and process animals at high production rates, for long periods of time in a wet and cold environment. Other workers may deal with heavy lifting, pushing, stretching or other demanding motions. These are all contributing factors of the annual 20-36% injury rates including back problems, musculoskeletal disorders, sprains, strains, cuts, punctures, carpal tunnel syndrome, ganglionic cysts, arthritis, bursitis, claw hand, trigger finger, tendonitis and Reynaud's disease (Barnard et al., 2003). Production is not paused for injury complaints and oftentimes workers will be fired if an injury is reported (McWilliams, 2019). Workers at or around both small family farms and large factory farms are also exposed to hazardous materials from animal waste, fluids and dander. Animal feces contain up to 150 pathogens that may be exposed to workers through the air and to the public through runoff into water supplies (Leighton, 2021). Zoonotic diseases—infectious diseases spread from animals to humans—often originate from factory farms and may cause pandemics.

Negative workplace factors such as low autonomy, low income, poor management style, high job demands, discrimination, and particularly the facilitation or observation of animal killing, cutting, skinning and boiling has caused many workers to suffer from mental health issues (Barnard et al., 2003). According to the systemic review done by Slade et al. (2021), the psychological distress (i.e. cognitive dissonance) workers experienced has led to post-traumatic stress disorder (PTSD), depression, anxiety, psychosis, somatization and violence. The mental health issues often consequently elicit the use of maladaptive emotion regulation strategies such as substance abuse, self harm or suicide and correlate with increased domestic violence, sadistic animal abuse, sexual assault and antisocial behaviour (Slade et al., 2021).

The slaughterhouse workforce demographic is primarily composed of People of Color, immigrants and ex-convicts with low socioeconomic statuses and limited educational attainment (Slade et al., 2021). Workers are exploited because of their limited employment options, which increases their willingness to tolerate harmful working conditions to keep a job. Worker testimonies describe institutional dehumanization due to not being able to interact with coworkers and constantly fearing being deported, losing their jobs due to injury reports, and being punished by management. The workplace safety and equity policies are not enforced as many workers can not read or understand their contractual rights due to illiteracy or language barriers (McWilliams, 2019).

Analyzing Sociological, Economic and Cultural Barriers for a Plant-Based Transition

Conditioned Restorative Strategies: Religion, Identity and Convenience

After exploring the detrimental effects of the animal agriculture industry and the contrastingly beneficial plant-based industry from an intersectional lens, it is evident that a plant-based transition is essential for improving the state of the world. According to Gradidge et al. (2021), however, we are currently facing a 'meat paradox' as the growing ethical, health and environmental concerns of meat consumption do not align with consumer behaviors. Despite the shared welfarist and abolitionist positions, about 80% of the population have omnivorous diets, meat consumption is on the rise, and the majority of meat being purchased derives from unethical factory farms.

The literature review by Gradidge et al. (2021) attributed the dual biocentric views and carnivorous consumer behaviors of the meat paradox to two primary psychological processes: triggers and restorative strategies. Biocentric philosophical positions derive from triggers—things that provoke empathy-driven feelings of discomfort associated with meat consumption such as seeing videos of animal slaughter in factory farms. Continued meat consumption derives from restorative strategies—tactics that aid people in relieving the triggered discomfort. A common strategy is justification through the '4N's' which is a belief that eating meat is 'nice', 'normal', 'necessary' and 'natural' (Piazza et. al., 2015). The justification strategy is also employed by considering animals to be incapable of feeling emotions or formulating thoughts and thus labeling them as inferior creatures that can be eaten. Another strategy is the concept of linguistic relativity where certain words are used to dissociate the animals from one's food such as 'meat', 'livestock', 'beef' or 'pork' rather than the names of the animals being used. Labeling veganism and vegetarianism as irrational and extremist can also influence carnivorous behaviors (Gradidge et al., 2021). However, these restorative strategies are not factually-based, and were instead conditioned and normalized throughout peoples' lifetimes to continue harmful consumption habits.

These restorative strategies are conditioned and perpetuated primarily by convenience and propaganda. The meat and dairy industries are powerful political players in the regulatory and legislative arenas. These industries have spent millions of dollars lobbying governments of leading agricultural countries to block climate policy, skew dietary guidelines and conceal animal cruelty within their practices (removing consumers' welfarist 'triggers'). Animal-based education is primarily founded on studies and data that is conducted by and manipulated by entities that profit off of animal agriculture. Research is often biased and framed to exclude data that is 'anti-meat' and amplifies findings that are 'pro-meat' (Nestle, 2018). The governments of Canada, the United States and other countries with leading animal agriculture industries also spend billions of dollars from taxes to subsidize the meat, dairy and fish industries. This creates a financial incentive for animal-based consumption due to reduced prices which is not being done for plant-based options. Millions of dollars are spent by these industries for advertising, where Frame Alignment Theory is employed to create positive connotations for animal consumption, for instance meat consumption is framed as masculine (Ruby et al., 2011), dairy consumption is framed as essential for strength, and seafood consumption is framed as luxurious. In recent years, companies have used more welfare labeling and buzzwords like 'free-range' and 'cruelty free' on product packaging despite their limited ethical treatment of animals, encouraging conspicuous consumption

of unaware 'progressive' buyers (Fetissenko, 2011). Also, vegan and vegetarian activists are portrayed as radical or extremist throughout the media. The proven detriments of animal-based consumption

Restorative strategies are also conditioned by culture, religion, and traditions which perpetuate the '4N' justifications and nurture people from a young age to associate animal-based consumption with their identities, which is difficult to dissociate. In Christianity, the Bible states that certain animals are permitted for consumption and Jesus Christ himself ate meat, thus Christians believe it is natural and moral (New International Version Bible, 2012, Deut.14:3-18). In Islam, it is believed certain animals can be eaten so long as they are treated and killed ethically and in the name of Allah (Rahman, 2017). In Judaism, certain meats are allowed and in the Torah some are even mandated in certain scenarios (Regenstein, 2003). Although the majority of religions declare that it is permissible to eat most animals, that does not mean it is mandatory or justified given the repercussions. Religion is often used and reinterpreted as a shield for actions that are morally questionable. However, as society, knowledge and accessibility has progressed through thousands of years, a lot of practices described in religious texts, such as meat-eating, have become unnecessary and obsolete.

To conclude, with the help of conditioned restorative strategies, the vegan movement has been struck with substantial hatred and defiance because it directly confronts the population's way of life. As quoted by Friedrich Nietzsche "Sometimes people don't want to hear the truth, because they don't want their illusions destroyed". However comfort and convenience is not a valid reason to cause animal suffering, environment destruction and perpetuate human injustices.

Income and the Economy

The meat, dairy and fish industries are big contributors to global GDP, employment and income. Globally, the meat industry is worth over $2 trillion and employs 5.4 million people (Dent, 2020) . The milk industry is worth $893 billion and employs 240 million people directly and indirectly (Shahbandeh, 2023). The fish industry is worth $256 billion and employs over 58 million people (FAO, 2022). Livestock also contributes about 20 percent of total agricultural output in developing nations and 40 percent in developed nations (FAO, n.d.). As highlighted in the study by Mason et al. (2022), replacing these industries with plant-based industries (fruits, vegetables, grains and animal product substitutes) can fill in for the GDP and employment contributions but may create substantial economic disruptions. Switching industries creates structural unemployment in the short term from the labour turnover of which many people can't recover from due to job inaccessibility or mismatched skills (Chen, 2023). Rural communities reliant on animal industries may suffer from the job loss if plant-based or any other large establishments are not nearby to take in the workers. Areas that do have these plant-based establishments may also suffer from the influx of workers which they may not have the infrastructure to handle. There is particularly a disadvantage for immigrants, people of color and people without an education who are the primary demographic of workers reliant on animal agriculture industries who may have troubles finding other jobs due to lack of training or skills (Slade et al., 2021).

These issues aren't projected to be extremely burdensome as the industry transition will be gradual not abrupt (as it currently is), relying on consumers' shift of demands away from animal products to predominantly plant-based products. Mason et al. (2022) continues by discussing how the plant-based industry is growing, and has been projected to create millions of jobs that will offset the job loss in animal agriculture and neutralize GDP (Saget et al., 2020). Furthermore, some livestock farmland and cropland dedicated to animal feed can be converted to grow fruits and vegetables, allowing many people in the meat and dairy industries to transition more easily without necessarily needing to move (Mason D'Croz et al., 2022; Christen, 2022).

Taste and Nutrition

A big concern with adopting a vegan diet is the idea that the absence of animal based products equates to deficiencies of important micronutrients (vitamin B-12, calcium, vitamin D and iodine) and protein (Bakaloudi et al, 2021). However, there are multiple natural plant-based foods, fortified plant-based alternatives or supplements that can be taken to ensure people following vegan diets are not deficient. Vitamin B12 can be acquired from foods such as nori, shitake mushrooms and nutritional yeast (Silver, 2020). Calcium can be acquired from soy products, beans, lentils, peas, almonds, sesame seeds and more (Petre, 2019). Iodine is found in seaweed, prunes, iodized salt and lima beans (Berkheiser, 2023). Vitamin D can be acquired from mushrooms or even just sunshine (Yetman, 2020). Lastly, protein can be acquired from seitan, beans, nuts, soy products, quinoa, oats, wild rice, broccoli, artichokes and more (Petre, 2023). Despite the misconceptions, there are numerous natural, vegan sources that contain all the vital vitamins and minerals needed for humans to be healthy.

The last common issue is that people do not want to give up meat, dairy or fish because they love the taste and believe that plant-based alternatives will not be a satisfactory replacement. However, companies like Daiya, Yves and Beyond Meat have risen in popularity as their plant-based substitutes closely emulate the taste, texture and presentation of their animal-based counterparts using ingredients like soy, peas, nuts and wheat gluten (Espinosa-Marrón et al, 2022).

First Steps Towards a Better World: Plant-based Meals and Education

Despite the extensive impacts of vegan diets on a range of social justice and environmental issues, it is not mainstream knowledge nor practice due to its general absence or conflicting messages portrayed in education systems of all levels. Elementary schools, middle schools, high schools, and post-secondary schools across the world predominantly have animal-based meals offered in cafeterias, by default, and lack any education about the intersectional issues of animal agriculture. Through school cafeteria meals, students are often consuming processed, animal-derived products that normalizes and habitualizes the consumption of harmful foods from a young age. Young students learn to dissociate from or ignore the fact that the food on their plate is actually a dead body of an innocent farm animal that they learned about in class. Speciesism is conditioned as they are taught that some animals are worth dying for food while others are loving pets. Schools outwardly display hypocrisy, as they promote living by virtues like kindness, compassion and love while consciously funding the torture and slaughter of innocent, sentient animals. Furthermore, the social justice and environmental action that is promoted does not include veganism—one of the most impactful lifestyle changes.

Given the negative impacts of the meat, dairy and fish industry on humans, animals and the planet, however, schools should be at the forefront of plant-based transition, by dismantling the conditioning and normalization of animal-derived consumption from a young age. In fact, providing plant-based meals and education is a perfect first step towards addressing the multitudes of issues as youth are the future generation of changemakers and are heavily shaped by their schools. Raising students with holistic education around the impact of their actions and the advantages of veganism can cyclically shape future generations. Students raised to be vegan become adults and pass on their knowledge and habits to their own children, creating ripples of transformation.

Furthermore, plant-based meals and education would greatly align with school objectives for positive student ideologies, behaviors and health. The provision of more or all plant-based meals in cafeterias would improve student health and encourage nutritional, sustainable habits at a young age. Chronic diseases such as cardiovascular disease and obesity have origins in childhood, so plant based nutrition in humans' early development stages can play a vital role in reducing future healthcare-related costs (Roque et. al., 2022). Promoting plant-based diets also aligns with school curriculums and values. Students can align with virtues of empathy, compassion, justice, responsibility and kindness taught in schools through intentionally eating cruelty-free, environmentally friendly meals. Additionally, after learning about the environment and human rights issues at schools, students can be given the opportunity to make

a big, daily impact on these topics through simple dietary changes. A vegan lifestyle helps and aligns with many of the 2030 United Nations' Sustainable Development Goals (UN SDGs) including life on land, life on water, climate action, zero hunger, clean water & sanitation, good health & wellbeing, and responsible consumption & production.(United Nations Department of Economic Social Affairs, 2023). Schools can empower the next generation of changemakers through showing students the power they have to make a difference, alongside other activists, world leaders and countries, on the UN SDGs.

This proposed first step to a global plant-based transition has already seen progress as schools across the globe have begun pilot programs introducing more plant-based options and education throughout the school year. States in the US including California, New York, Hawaii and Florida have begun altering school food policies to encourage more vegan and vegetarian options in cafeterias (Eckart et al., 2010). Many activists and organizations such as Chef Ann Foundation, the Coalition for Healthy School Food and Physicians Committee for Responsible Medicine are also advocating for and aiding with the plant-based transition for schools in other states and countries. The most recent PETA Vegan Report Card which grades universities across the US on how vegan friendly they are, found more than 700 schools earned an "A" or "B" (which has increased by over 500 since the first report in 2013), including prestigious institutions like MIT, Yale University and Cornell University (PETA, 2019)**.** Furthermore, studies done in over 30 different schools with a diverse demographic of thousands of K-12 students in North America and Europe, found great ease of implementation and success in their plant-based meal programs, some of which included the implementation of marketing tactics and/or education. Results displayed high student interest with equivalent or higher plant-based meal purchases than regular meals and equivalent food waste. Compared to animal-based meals, students got more calories, fiber, sodium and vitamins and less saturated fat when eating the vegan entrees. Some kitchen staff also reported vegan meal preparation to be fairly simple (Flores et al., 2019; Eckart et al., 2010; Ensaff et al., 2015) . This goes to show the great potential of successful vegan meal implementation.

Conclusion

In conclusion, this research paper has comprehensively delved into the multifaceted landscape surrounding dietary choices and its effects on human, animal and environmental welfare issues. The animal agriculture industry evidently has an undeniable impact on the world's most pressing issues. The hidden costs of meat, dairy, and fish industries perpetuate an intricate web of issues, from deforestation and greenhouse gas emissions to the mistreatment of sentient beings and the escalation of chronic health conditions. However, the prospect of transitioning towards a plant-based world can help counteract the negative effects of animal agriculture, including environmental restoration through reduced resource consumption and lowered emissions, ethical transformation by alleviating animal exploitation, and enhanced human well-being driven by healthier food choices and working conditions. Barriers to a global vegan transition such as restorative strategies, economic disruption, plant-based alternative health and vegan nutrition are misconstrued or miniscule setbacks compared to the extensive advantages of veganism. In order to initiate the plant-based transition, however, a powerful first step would be positively rewiring minds and behaviors at a young age through the integration of plant-based meals and education within schools of all levels. The significance of school value alignment, opportunities for action, and improved health is evident in the successful plant-based programs of pioneering schools, underscoring the transformative potential of K-12 implementation. Therefore, as we envision a future where compassion and sustainability harmonize, the choice to shift towards plant-based diets emerges not only as a powerful remedy to the ills of the present but also as a promising pathway towards a healthier, more equitable, and vibrant world for all.

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