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An Ethical Overview of Animal Welfare and the Use of Antibiotics

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Abstract:
Antibiotic use in livestock has been indicted for playing a key role in the emerging public health calamity of antibiotic resistance in human beings. While antibiotics are vital medical tools that help to fight bacterial infections, scientific opinion proposes that if animal farmers continue to use them sub-therapeutically in animal feeds, they will pose a severe threat to human health as well as animals. This paper object to the use of antibiotics in animal feeds, not only because it affects human health, but insofar as it also promotes or makes possible farming practices that significantly harm animals, and has no independent value aside from doing so. This paper argues that it is possible to stop the spread of disease through proper sanitation and effective cleaning of farms while providing animals with environments that fit their needs and interests. Furthermore, improvements in production practices that reflect good animal welfare is something that we owe to animals, as they are beings with interests and needs that ought to be respected and protected in the same way that our interests and needs ought to be.

Keywords: Ethics, Animal Welfare, Antibiotic.

INTRODUCTION

What do the issues surrounding the relationship between animal welfare and antibiotics have to do with ethics? And why should we care for animals? Recognizing that animals suffer and are capable of being harmed as a serious problem is considered to be, what is called, an ethical judgment. An ethical judgment is one where we dictate some action or some person as being right or wrong, good or bad. Any human activity is predicated on an ethical judgment. Our vision of the good, of what is right and wrong to do, underlies everything we do at all levels be it at the social level of policies about taxation and redistribution of wealth, which kind of science we do and don't fund (research into environmental preservation vs. research into the relationship between race and intelligence), our views of punishment and rehabilitation, and so on, or be it at the level of individual action (Ojong, 2019). Therefore, animal use, by humans, is a human activity that is also predicated on ethical judgments. That being said, what we are attempting to show is that the sub- or non-therapeutic use of antibiotics on food-producing animals is a human practice that is predicated on an ethical judgment that is particularly objectionable.

One problem is that food animal producers don't seem to believe that their line of business is partly in the business of ethics. Many claim that the conditions and processes that constitute the factory farm are not a matter of ethics but of a societal necessity to feed a growing population. In fact, they seem to think they do not make value judgments at all. Animal agriculturalists, since the industrial revolution, have come to see themselves as simply in the business of "applying industrial methods to the production of animals," (Betzig, 2012: 2010) in order to produce food for consumers and neglect the ethical implications of their actions. It makes their job a lot easier to discount animal pain, interests, consciousness, etc. as either non-existent or not important (which is an implicit value claim). But there is now a rise in the public questioning of animal use in industry as it is widely undeniable that the hurting and killing of some living being that works to avoid being hurt and getting killed is an ethical issue. Producers seem to fail to consider the ethical dimensions of their practices not only as it has created food safety issues for consumers, but as it has also created welfare issues for their animals. Every time one harms an animal in these ways, one is making an implicit moral decision, namely, that the most efficient, cheap, and profitable way to produce food morally outweighs the pain, suffering, or distress imposed on such animals in order to do so.

Ethics is a branch of philosophy that is concerned about what we ought to do in terms of our actions. It is a normative inquiry, which means that it seeks to establish and prescribe norms, standards, or principles for evaluating actual practices (Ogar et al. 2016). Normative ethics specifically work towards designating the philosophical task of discerning which actions are genuinely good or bad based on which moral principles are rationally defensible (Ogar et al. 2016). In this paper, we present the logical examination, critique, and study of the ethical beliefs that food producers of factory farms seem to implicitly hold, which is the use of antibiotics in animal feeds.

ANTIMICROBIALS

Microorganisms, or microbes, are living microscopic organisms such as bacteria (e.g., Staphylococcus aureus, which causes some staph infections), fungi (e.g., Candida albicans, which cause some yeast infections) parasites (e.g., Plasmodium falciparum, which causes malaria), molds (fungi), protozoa, algae, and rickettsia, that make up more than 60% of the earth's living matter (Antimicrobials 2020). They are all around us, in the air, in our bodies, and the water. Microbes are usually fast-growing, spread rapidly, and while most are beneficial and necessary (otherwise known as commensal bacteria), some may be pathogenic and cause disease within the human body, like staphylococcus aureus. In which case, antimicrobials may be needed to intervene (Marinelli & Tomasz 2010). Antimicrobial agents are specific drugs, medicines, chemicals (like disinfectants), or other substances that are used to either kill or inhibit the growth of microorganisms, targeted at pathogenic ones. Among the many types of antimicrobials is the antibiotic, which is a drug specifically used to combat or prevent bacterial infections in humans and animals (Hancock & Strohl 2001). Penicillin, derived from the mold Penicillin, was discovered in 1928 by Alexander Fleming, and was identified as the first chemical compound with antibiotic properties, and was among the first antibiotics used by doctors to treat bacterial infections (Hancock & Strohl 2001).

Antibiotics have been an important medical tool used to treat infections or illnesses caused by bacteria in humans such as syphilis, pneumonia, tuberculosis, and some forms of meningitis (Davies 2006). They revolutionized medicine in the 20th century has led to the near eradication of diseases such as tuberculosis in the developed world. Antibiotics are not effective against viruses or viral infections such as the common cold or influenza. With the advent of World War II in 1942, they became widely developed and commonly used to fight against streptococcus (strep throat), staphylococcus, Chlamydia, and more (Hancock & Strohl 2001).

In the United States as well as Africa, antimicrobials are also regularly used to treat infections or illnesses in food-producing animals. Food animals are especially susceptible to opportunistic microbes (usually benign or commensal but can cause disease given the right circumstances), such as bacteria, and thus are often exposed to antimicrobials, such as the antibiotic, to treat and prevent infectious bacterial disease and/or to promote growth and improve feed efficiency. Many of these antimicrobials are identical to or closely resemble drugs used in humans (Finkelman & Polson 2015).

Typically, the antibiotic is distributed to the animals by supplementing them into livestock feed, as it is more efficient to mass medicate entire groups as opposed to individual treatment. Unfortunately, there is no reliable data on the precise figures for the quantity of antimicrobials used in food animals or humans available publicly, but various groups have reported estimates on the figures.

Antimicrobials may be used in any of three ways: therapeutically, or sub-therapeutically, which includes non-therapeutic and/or prohylactic use. The Union of Concerned Scientists (UCS) estimates that approximately 70% of antimicrobials used in the United States are used non-therapeutically in industrial farm animal production (cattle, swine, and poultry), including many antibiotics such as penicillin and tetracycline that are used to treat human infections (Robbins 2014).The Pew Commission on Industrialized Farm Animal Production (PCIFAP) defines non-therapeutic as any use of antimicrobials in food animals in the absence of microbial disease or known (documented) microbial disease exposure; thus, any use of the drug as an additive for growth promotion, feed efficiency, weight gain, routine disease prevention in the absence of documented exposure, or other routine purpose is considered non-therapeutic (Finkelman & Polson 2015). The non-therapeutic use of antimicrobials can be contrasted with the therapeutic use of antimicrobials, which the Pew Commission defines as the use of antimicrobials in food animals with diagnosed microbial disease and the prophylactic use of antimicrobials, which the Pew Commission defines as the use of antimicrobials in healthy animals in advance of an expected exposure to an infectious agent or after such exposure but before the onset of laboratory-confirmed clinical disease as determined by a licensed professional (Robbins 2014).

In February 2000, according to a survey of the members of the Animal Health Institute, 17.8 million pounds of antimicrobials were used in animal production in 1998—14.7 million pounds (83%) for the prevention and treatment of disease, and 3.1million pounds (17%) for growth promotion. More recently, a report from the Union of Concerned Scientists (UCS) estimated that about 50 million courses of treatment, or about 3 million pounds, are administered to humans annually; it also estimated that an additional 1.5 million pounds of antimicrobials are used in topical creams, soaps, and disinfectants, contributing to a total of 4.5 million pounds being used annually in humans. The report further estimated that 27.5 million pounds of antimicrobials are used for non-therapeutic purposes (growth promotion and disease prophylaxis), and another 2 million pounds are used for therapeutic purposes in animals (Katz & Ward 2015). Discrepancies among estimates are unfortunate, and accurate values are certainly important to understand and evaluate the extent of microbial use in human beings and animals. But there is general consensus towards the fact that a very large sum of antimicrobials is used in food production animals, and are used so non-therapeutically, either as growth promoters or disease prophylaxis.

WHAT IS THE CONCERN ABOUT ANTIMICROBIAL USE?

The mass use of antimicrobials in this way is a major topic of controversy and concern as there is now an increased awareness of antimicrobial-resistant bacteria in human beings. Stuart B. Levy, distinguished professor of molecular biology and microbiology and of medicine at Tufts University school of medicine remarks on the paradoxical nature of human engagement with antibiotics when he says, "On the one hand, these miraculous drugs are pillars of modern medicine, helping us to manage and prevent dangerous bacterial infections and save lives. On the other hand, the widespread use, and misuse, of antibiotic drugs has spawned the evolution of life-threatening bacteria that render our current antibiotics useless"(Wohlleben 2016: 542). Antimicrobial resistance is the ability of microbes, such as bacteria, to grow and continue to multiply in the presence of an administered antimicrobial, such as an antibiotic, that would normally kill or limit their growth (Waldrop 2009). When bacteria are exposed to a subclinical amount of microbial, they learn to "outsmart" the drug and become resistant. This resistant bacteria can then multiply and pass genetic material to other unrelated bacteria, making the other bacteria resistant as well. Antimicrobial resistance is a public health issue and the costs associated with resistance are multiple, as resistance makes it harder to eliminate infections from the human body, making treatment options more limited. The loss of cheaper, older agents for effective therapy and the need to acquire more expensive ones are easily recognized costs.

In addition, inadequate or failed treatment of patients leading to morbidity and mortality is a huge human cost (Waldrop 2009).

One of the potential contributors to this concern is the overuse of antibiotics in human medicine. This includes the over-prescription of antibiotics by doctors that are frequently prescribed to patients in order to treat symptoms or diseases that do not respond to antibiotics (i.e., viruses), or are likely to resolve without treatment.

Many scientists believe that feeding antibiotics to livestock encourages this resistance to antibiotic agents in important human pathogens as well (Bagno et al. 2018). The recent control of microbial usage for growth promotion and mass treatment in the European Union (EU) has resulted in reductions in resistance rates, suggesting that a significant selective effect is associated with agricultural usage (Bagno et al. 2018). This is mainly due to the purported overuse and misuse of antimicrobials in food production animals for non-therapeutic purposes, of which these animals are then regularly consumed for food by humans. For instance, penicillin is a commonly used antibiotic in animals as well as humans. Levy's research on the effects of introducing antibiotic-laced feed on farms concluded to show that especially low-dose non-therapeutic amounts of antibiotics can, in fact, select for, and help propogate, bacteria resistant to the drug at high levels (Bagno et al. 2018). Therefore, the improper overuse of penicillin can lead to even higher levels of consumer exposure to that strain. In animals, antimicrobial resistance in zoonotic enteropathogens (e.g., Salmonella, Campylobacter, Klebsiella, and some strains of E. coli, such as serotype O157:H7) and commensals (e.g., enterococci, most generic E. coli) is of special concern to human health because these bacteria are most likely to be transferred through the food chain to humans, or resistance genes in commensal bacteria may be transferred to the zoonotic enteropathogens. There is considerable evidence that antimicrobial use in animals selects for resistance in commensals and in zoonotic enteropathogens (Smith 2015). Currently, foodborne pathogens developing the greatest antimicoribal resistance include Salmonella and Campylobacter (Papapetropoulou & Mavridou 2018). Antibiotics and antibiotic-resistant bacteria can also be found in the air, groundwater, and soil around farms (Woappi et al. 2016). Thus, not only can people be exposed to these pathogens through infected meat, but people can be exposed to these pathogens through vegetables fertilized with raw manure, and water supplies contaminated by farm animal waste, i.e., listeria.

The specific concerns with the development of antimicrobial resistance in foodborne pathogens can be summed up as follows:

1. resistant pathogens contaminating food animals have the potential to be transferred to products derived from the same and consumed by humans;
2. human use of antibiotics increases the risk of acquiring an infection with an antimicrobial resistant pathogen;
3. human infection by an antimicrobial-resistant pathogen limits treatment options; and
4. antimicrobial-resistant pathogens may develop increased virulence (Smith 2015).

The Center for Disease Control and Prevention claims that every year in the United States, at least 2 million people become infected with bacteria that are resistant to antibiotics and at least 23,000 people die each year as a direct result of these infections. The association between antimicrobials used in food production animals and emerging human antimicrobial resistance is a pressing subject matter, and much of the concern about the issue is directed towards the negative health effects it has on human beings. The issue is a very complex one and thus no simple solutions can be given to solve the problem. One major recommendation, advocated for by the Pew Commission, is to restrict the use of antimicrobials in food animal production to reduce the risk of antimicrobial resistance to medically important antibiotics. More specifically, phase out and ban the use of antimicrobials for non-therapeutic (i.e., growth-promoting) use in food animals, (Woappi et al. 2016) so that there isn't the problem of overuse and high exposure to human beings in food. Other various interest groups have also created strong pressures to preserve the effectiveness of hard-to-replace antibiotics by reducing uses that they consider non-essential, whether that be in food animals, or eliminating practices such as the widespread supply of prescriptions to consumers who may have viral or other illnesses not likely to benefit from antibiotic restrictions (Bartelt 2014). The premise of these regulations on food

safety will hopefully work towards the minimization of antibiotic-resistant foodborne pathogens in animals and thus decrease the risk of human beings.

ANIMAL'S WELFARE

Not only human beings but animals, too, have welfare. A denial of this by food producers is a denial of straight facts. Universally, the biological sciences accepts the dictum that all biology must be structured within the framework of evolutionary theory and embraces this principle in all studies of physical and mental processes up and down the phylogenetic scale (Bruce & Yearley 2014). Therefore, many of the mental states which appear in humans and have subjective dimensions certainly simple ones like hunger, taste preference, fear, anxiety, anger, sexual desire, pain, pleasure, and so on, have analogies in the conscious or mental states of animals- certainly in those animals in which physiological, behavioral, and contextual similarities to humans are apparent (Bruce & Yearley 2014). This means that animals can either fare well or fare poorly depending on whether or not their individual interests (whether that be physical, mental or emotional) have been respected or violated. Animals have basic biological interests that include things such as having good physical health, avoiding pain, adequate social stimulation, and so on. Based on these, arguably, basic biological animal interests and needs, this means that an animal who is free from physical pain, who is in good health, and is provided with adequate social stimulation (if it is a social animal) and has enough food, water, and sunlight to survive in an environment that caters to these needs, may be said to be faring well in the world. If these basic interests that animals possess are not met, it may be said that this animal is fairing poorly in the world. This is because animals, too, care about their interests being met. They have an interest in survival, avoiding pain and seeking out pleasure. They have basic needs for food, water, shelter, social interaction, freedom from constraint, and they have desires to fulfill these needs. If they are not met, they suffer. Animals can suffer physically, such as experiencing pain or hunger, and they can suffer mentally. Animals can feel distress, fear, anxiety, pleasure, boredom, happiness, and other morally relevant modalities of mentation (Grandin & Deesing 2002). Animals are capable of suffering physically and mentally if their basic interests are not respected and protected. Thus, the implicit denial by food producers that the interests or welfare of their animals do not matter is incompatible with our fundamental ethical commitments to other subjects with interests and is morally indefensible.

Animal welfare is based on the state of biological needs of the animal and aims to provide all livestock with conditions of life that are harmonized with their nature (Grandin & Deesing 2002). We will examine more fully what animal welfare means and why we ought to respect it later on in this discussion. The overuse of antimicrobials in animal agriculture negatively affects the welfare of food animals as it allows us to, in Bernard Rollins' words, "force square pegs into round holes and round pegs into square holes, and to place animals into environments where they suffer. In other words, non-therapeutic mass use of antimicrobials in animal feeds allows farmers to confine food animals in unhealthy environments that do not cater to the animal's nature or biological needs" (Whitney 2014). Further, these questionable animal confinement practices would not even be possible if it were not for the use of antimicrobials. The success of technological agriculture, or the application of industrial methods to the production of animals, is partly indebted to the utilization of "technological sanders," such as antibiotics, that are used to compensate for the unhealthy conditions animals are kept. They are especially helpful to prevent "wildfire" spread of disease in crowded conditions with vast concentrations of animals. "If a nineteenth-century agriculturalist had, for example, tried to raise a hundred thousand egg-laying hens in cages in one building, they all would have died of the disease in a month; today, however, such systems dominate animal agriculture" (Wildfire 2017). Thus, this type of animal agriculture that is practiced in Western industrialized countries such as the United States "is responsible for far more animal suffering than all other uses of animals combined" (Rowlands 2020: 85).

To reiterate, the overuse of antimicrobials poses a threat to human health. The way in which it does so is already a popular and widely discussed issue as we have previously fleshed out. The overuse of antimicrobials also poses a threat to farm animal health. The ways in which it does so are, mistakenly, not a widely discussed issue. Non-therapeutic use of antimicrobials such as the antibiotic (either as a

growth promoter or as a prophylactic to compensate for unhealthy living conditions) is one sub-practice that is, today, necessary for the maintenance of the larger practice of intensive industrial farming (i.e., animal agriculture production practices that keep large numbers of the same species of animal in closely confined quarters indoors). Insofar as this practice promotes or makes possible farming practices that significantly harm animal welfare, and has no other value, the practice is objectionable, and therefore, gives us good reason to stop the practice or considerably regulate it. Thus, not only should the non-therapeutic use of antimicrobials in animal agricultural be restricted because of the major costs it presents to human health, it should be restricted because of the major costs it presents to animal health and welfare.

ANIMAL SUFFERING

Given that animals, too, are capable of fairing well or poorly in the world, and given that animals, too, have basic biological interests of which when they are not met causes suffering, there is still, ironically, not ubiquitous agreement amongst human beings that having ones welfare-interests be respected and protected is something that all animals deserve. Animals used for scientific research and animals used for food production are notoriously neglected, by a majority of humans, as beings who are worthy of being objects of moral concern. Biomedical and other scientific research, toxicological safety testing, uses of animals in teachings, pharmaceutical product extraction from animals, and so on all produce animal suffering that the majority of human beings allow or consent to be done. "This suffering comes from creating disease, burns, trauma, fractures, and the like in animals in order to study them; producing pain, fear, learned helplessness, aggression, and other states for research; poisoning animals for research to study toxicity; and performing surgery on animals to develop new operative procedures" (Aaltola 2013: 564). Moreover, the ways in which animals are kept and housed in scientific facilities for research also causes grave animal discomfort and suffering. So as to be more convenient for the researcher, animals are usually housed in conditions that do not cater to their biological needs and interests, nor reflect their natural environment, which further exacerbates the suffering they undergo.

Confinement industrialized agriculture uses far and away the largest number of animals of any human pursuit (Aaltola 2012) and is responsible for many forms of animal suffering as well, in the form of deliberately providing poor welfare by frustrating their basic biological needs and interests. Three forms of animal suffering produced by confinement industrialized agriculture that Rollin identifies are (Aaltola 2012):

1. Production diseases. These arise from the new ways the animals are produced. Cattle suffer from poor health and liver abscesses as a response to the highconcentrate, low-roughage diet that characterizes feedlot production.
2. Lack of individual attention provided to animals. This is due to the huge scale of industrialized agriculture operations and the small profit margin per animal combined with minimal labor. For instance, there may be three full-time employees and one manager overseeing approximately five thousand animals. Therefore, when animals are physically injured and in pain, producers usually cannot afford the manpower to care for and treat these injuries.
3. Physical and psychological deprivation. Confinement agriculture results in lack of space, lack of companionship for social animals, inability to move freely, boredom, austerity of environments, and so on.

Good health, freedom from injury and disease, access to proper care and treatment, and adequate physical and psychological well-being are interests that both humans and animals alike share. When any of these interests are violated, suffering occurs. We think it of great moral importance that human beings do not undergo these types of sufferings. For instance, one might compare the treatment of animals in confinement agriculture to the treatment of Jews under Adolf Hitler's Nazi regime during World War II. Jews were held captive in concentration camps where they worked as slave laborers in environments that were completely inimical to their biological natures. These prisoners lived in cramped and crowded conditions where poor health, disease and injury thrived, with little to no medical attention given by their captors. They, too, were unable to move freely and maintain companionship with their loved ones and family members. As a result, these Jews underwent

tremendous suffering. When we examine the acts committed by the Nazi regime, we believe them to be morally wrong. We agree that no human being should be treated like this and make an effort to prevent our basic interests ever being violated in such a way. Yet in the case of food production animals, most of us look the other way. Thus, if we take other human beings to be morally considerable based on the fact that they have a welfare that is capable of being benefited or harmed, then it follows that we must also include animals in our moral arena as worthy of being objects of moral concern when we make decisions about what to do (Morton 2000). As human beings we are moral agents, and should treat animals as moral patients (Morton 2000). Just as we work to respect other human being's welfare-interests, we ought to respect another non-human animal's welfare-interests.

EQUAL CONSIDERATION TO ANIMALS

The basis of the case for the protection of welfare-interests to be extended to nonhuman animals is something that has been defended by many thinkers in the branch of moral philosophy and the animal rights movement. Peter Singer makes a strong argument in favor of this position in his book Animal Liberation for which he, too, argues that nonhuman animals ought to be taken into moral consideration by human beings in terms of having their welfare interests be respected and protected (DeGrazia 2012). Furthermore, he asserts that if we do not take their welfare- interests into consideration when we decide how we go about treating animals, we have exhibited a form of what he calls "speciesism," which is akin to that of racism and sexism. Singer defines speciesism as a "prejudice or attitude of bias in favor of the interests of members of one's own species against those members of other species," (Francione 2015: 75) and that on the same grounds that racism and sexism are morally condemnable, so too, is speciesism. In other words, the same discriminatory thought process that human beings have used to justify a neglection of the interests of another group of people, such as has historically been with blacks and women, is used in a similar way to justify a neglection of the interests of the nonhuman animal species (especially food production animals).

Singer argues that it would be irrational to demand equality for blacks, women, homosexuals and other oppressed groups of people while denying equal consideration to nonhuman animals. By equal consideration, he simply means that the same respect we give to the interests of human beings ought to be given to the interests of nonhuman animals as well. "The basic element, the taking into account of the interests of the being, whatever those interests may be, must, according to the principle of equality, be extended to all beings, black or white, masculine or feminine, human or nonhuman" (Zuolo 2019: 63). Further, "the interests of every being affected by an action are to be taken into account and given the same weight as the like interests of any other being" (Zuolo 2019: 64). To be clear, Singer does not think that humans and nonhuman animals should be treated equally, obviously, there are important differences between these species, just as there are important differences between men and women, only that the interests of these different groups be treated equally. Thus, if we are to respect the fact that humans have an interest in survival, avoiding pain and seeking out pleasure, social interaction, freedom from constraint, etc., then we should also respect the fact that animals have an interest in survival, avoiding pain and seeking out pleasure, social interaction, freedom from constraint, etc.

Racism and sexism are wrong because proponents who wish to defend these types of hierarchical distinctions work to point out arbitrary differences in capacities or abilities amongst human beings in order to discern who gets what kind of treatment. For instance, those who condone pay differences between sexes might do so on the basis that because someone is of the female sex they are intellectually inferior to men, lack reason, are emotionally unstable, etc. The white racist claims that whites are superior to blacks in a similar way. But the mere fact that a person is black or a woman cannot infer anything about that person's intellectual or moral capacities. This is why it is unjustifiable to discriminate on the basis of sex or race. Even if there were actual, measurable differences in ability both among races and between sexes, Singer asserts that the claim to having equal consideration of interests does not depend on intelligence, moral capacity, physical strength, reason, or similar matters of fact. "There is no logically compelling reason for assuming that a factual difference in ability between two people justifies any difference in the amount of consideration we

give to their needs and interests" (Lindsay 2017: 35). For example, a newborn baby is considerably less intelligent and less strong than an adult woman, yet we would not say that this is a justifiable reason to not respect and protect its interests. We would think it morally wrong to harm the newborn baby, to not feed it, to constrain it, to deny it social interaction, and so on. Yet, people still attempt to cite differences between human beings and animals in order to provide a rational basis for excluding animals from the scope of our moral deliberations. Some of these include: humans are intellectually superior than animals (as has already been noted), humans are rational and animals are not, humans possess language and animals do not, humans are capable of acting morally and animals are not, etc. But it is safe to say that infants and many young children, the insane and mentally ill, and the senile all possess fewer of these qualities than many mammalian animals do. Considering this, we do not hold that an animal's interests ought to be more important than any of these groups. And we would not allow the atrocities we bring upon animals to these groups either. Thus, on these same grounds, just because a nonhuman animal might be considerably less intelligent or lack the same amount of strength as a human being, it does not mean their interests should not be respected and protected. It would be morally wrong to harm a nonhuman animal for the same reasons it would be wrong to harm a baby.

INHERENT VALUE

Tom Regan is a philosopher who defends that the protection of welfare-interests should be extended to nonhuman animals based on what he calls "the rights view" (Francione 2018, 41). On the rights view, the relevant feature that all subjects worthy of moral consideration share is that we are each of us, what he calls, "the experiencing subject of a life." An experiencing subject of a life is a conscious creature having an individual welfare that has importance to us whatever our usefulness to others (Francione 2018). Regan continues, "We want and prefer things, believe and feel things, recall and expect things, and all of these dimensions of our life, including our pleasure and pain, our enjoyment and suffering, our satisfaction and frustration, our continued existence or our untimely death, all make a difference to the quality of our life as lived, as experienced, by us as individuals. As the same is true of those animals that concern us (the ones that are eaten and trapped for example), they too must be viewed as the experiencing subjects of a life, with inherent value of their own" (Regan 1990: 74).

For Regan, inherent value belongs equally to those who are experiencing subjects of a life, and that animals are included as belonging in this category. Inherent value refers to the type of value that someone or something has above and beyond their usefulness to others. Some might refer to inherent value as having value "in and of itself." All human beings have inherent value regardless of their sex, race, sexual orientation, religion, birthplace, and so on. One's talents, skills, intelligence, wealth, and strength are also irrelevant to one's having such value. "The genius and the retarded child, the prince and the pauper, Mother Teresa and the most scrupulous used-car salesman all have inherent value, all possess it equally, and have an equal right to be treated in ways that do not reduce them to the status of things, as if they existed as resources for other" (Rowlands 1998: 88). In the case of nonhuman animals, they too, all have value independently of their usefulness to science and research opportunities in laboratories, independently of the fact that they can be used for food and clothing, and independently of the fact that they may be cute and comforting companion animals. Regan asserts that all who have inherent value have it equally, whether they are human animals or not (Rowlands 1998). The fact that animals have equal inherent value as human beings means that they have the equal right to have their interests be respected and protected and that we have a duty to one another to make sure this is carried out.

ANIMAL WELFARE AND ANTIBIOTICS

Most factory farming in intensive confinement agriculture as it is currently practiced is harmful to animals because the ways in which food animals are kept and treated deliberately frustrate all of the five freedoms. Like any major industry, the primary goal of these modern agricultural systems is to maximize profit by keeping more animals on farms that can be managed by fewer people (Refsdal 2000). In order to make these systems more convenient, efficient, and profitable for the producer, they

operate by keeping stocking densities of the animals at extremely high numbers in environments that are unfavorable to their basic biological natures. Animals in these systems suffer in ways such as severe reduction in behavioral repertoires, boredom, stress, social deprivation or social crowding, high levels of surgical and drug-based interventions, stereotypical behaviors, and other vices such as tail biting, as well as pain and fear (Bernal-Barragán et al, 2019: 43).

The sub-or non-therapeutic use of antibiotics is one sub-practice that is necessary for the maintenance of these practices typical of industrial farming that violate the five freedoms. Antibiotics used in this way, is one of the major contributing factors that allow farming methods to deliberately violate the five freedoms and welfare-interests of these animals. Used as a technological sander, or quick fix solution for keeping animals in unhealthy living conditions and environments, the non-therapeutic use of antibiotics has meant that producers no longer need to protect and respect the basic biological needs and interests of their animals. In 1979, the congressional Office of Technology Assessment wrote, "Present production is concentrated in high-volume, crowded, stressful environments, made possible in part by the routine use of antibacterial in feed. Thus the current dependency on low-level use of antibacterial to increase or maintain production, while of immediate benefit, also could be the Achilles' heel of present production methods" (Refsdal 2000: 110).

If we ought to care about animal welfare at all in ways that are morally significant, then the sub-, or non-therapeutic use of antibiotics in animal agriculture should be prohibited, and this is a moral obligation that we do so. If the basic welfare-interests of animals ought to be taken into equal consideration as the welfare-interests of human beings, and if the misuse of antibiotics is one practice that promotes the violation of these interests, then this gives us a reason to stop using them. The restriction of antibiotics in the way I have so described may be one way to improve their quality of life as it might foster a way of farming that better suits the needs and interests of livestock. Identifying antimicrobial use as a problem attacks food safety issues at their source. Rollin cites British bacteriologist E.S. Anderson, in a 1965 article in Nature, who argued that improved standards of husbandry could replace the use of antibiotics for both disease prophylaxis and growth promotion (Bernal-Barragán et al. 2019). Therefore, instead of trying to fix animal health problems with antibiotics after they have occurred, instituting better sanitary and health practices at the farm level will be obligatory.

CURTAILMENT OF NON-THERAPEUTIC ANTIBIOTIC USE IS MORALLY DEFENSIBLE

Certainly, there seems to be some real potential in social human and animal welfare benefits to curtailing non-therapeutic use of antibiotics in animal agriculture that will improve physical animal pain and suffering through the better husbandry practices of a morally defensible agriculture while not affecting the physical pain and suffering of human beings! At the very least, if we have the ability to improve animal welfare at no significant expense to us, then this is something we morally ought to do. Both humans and animals share the basic interest in avoiding physical pain and suffering. If humans and animals are subjects worthy of having their interests be respected and protected equally, and if it is possible to do so equally, then the curtailment of antibiotics for non-therapeutic purposes in feedlots is morally defensible. Not only would the ban on non-therapeutic antibiotic use help animals at little expense to basic human interests, there is good reason to believe that it would further improve human well-being as it could stop the agricultural shortcuts used that allow for many food safety and human health safety issues. The ways in which it would do so being: the prevention of the risks of antibiotic resistance, restoring jobs to small family farms, fewer health safety problems for farm workers, and fewer cases of toxin and chemical residues in food. Thus, respecting an animal's basic interests does not necessarily mean subordinating the most important of one's own interests to those of animals, but looking for ways of resolving conflicts of interests that consider the animal's interests, especially the most important ones.

The issue of antimicrobial resistance and antibiotic overuse in food animals has gained attention and has become a major challenge as the development of antimicrobial resistance in foodborne and clinically important bacteria threatens the welfare-interests of human beings. There is little concern regarding the relationship between inappropriate production conditions in livestock and antibiotic

usage compared to the concern regarding the relationship between human health and antibiotic usage. But the overuse of antibiotics in food animals not only threatens the welfare-interests of human beings, it also threatens the welfare-interests of food production animals in intensive industrial systems. Thus, this is why we should also talk about animals when we talk about our concern surrounding antibiotics. Farm animals should not be left out of this greater conversation. Not only the welfare of human beings, but, the welfare of the animals we consume for food should be an integral component in the decisions we make about how we use or do not use antibiotics. The Pew Commission on Industrialized Farm Animal Production (PCIFAP) has similarly recommended that we restrict the use of antimicrobials in food animal production, (Albala & Rollin 2015) at the benefit of both human and nonhuman animals. This health recommendation includes:

1. Phase out and ban the use of antimicrobials for non-therapeutic use in food animals.
2. Immediately ban any new approvals of antimicrobials for non-therapeutic uses in food animals and retroactively investigate antimicrobials previously approved.
3. Facilitate reduction in industrial farm animal production (IFAP) use of antibiotics and educate producers on how to raise food animals without using non-therapeutic antibiotics, the U.S. department of Agriculture's (USDA) extension service should be tasked to create and expand programs that teach producers the husbandry methods and best practices necessary to maintain the high level of efficiency and productivity they enjoy today (USDA 2015).

The American Medical Association, the American Public Health Association, the Infectious Diseases Society of America, and the American Academy of Pediatrics - among 300 other organizations worldwide - have condemned lacing the feed of farm animals with antibiotics. Despite the widespread outcry against this practice from the public health community, a majority of agribusiness continues to engage in this dangerous custom, (USDA 2015) where animals are treated as units of production rather than subjects with interests, desires, and needs. The European Union took steps a decade ago to ban the use of antibiotics on farm animals for non-treatment purposes, but the United States and many African countries has lagged far behind in this area.

CAN ANIMALS BE RAISED WITHOUT ANTIBIOTICS?

There exists a multitude of factors, issues (such as environmental concerns), problems, and various interests (consumer, animal, farmer, business owner, veterinarian, etc.) that constitute the very complicated layers involved in the institution of factory farming and the distribution of preventative antibiotics. Unfortunately, we cannot address any more of them here as that would deviate from the scope of this paper. Our objective is simply (or not so simply) to identify some of the issues surrounding preventative antibiotics that concern farm animals in a morally significant way in relation to how they concern us. Therefore, the last question we will consider is: can animals be raised without antibiotics? Can the world raise meat without creating conditions that are dreadful for the animals?

The answer is: yes, we can. And we did it for thousands of years before the "luxury" of efficiency and productivity antibiotics brought to farmers. Before the 1940s, animal agriculture was extensive and animals were successfully raised and productive without the use of preventative or growth promoting antibiotics. This was possible because farmers provided their animals with good husbandry practices: they put animals into environments best suited for them to survive and thrive in accordance with their natures, they kept the environments clean and sanitary, and they provided proper care for the sick and injured.

Recently, a Missouri farmer named Russ Kremer spoke out about the possibility of raising animals without antibiotics. He has raised swine without antibiotics for 25 years simply by focusing on management practices that prevent illness and death. These include improvement of housing conditions and reduction of population density (Singer et al. 2019). His results from this, he says, are "healthier animals with a dramatic reduction in mortality rates" (Singer et al. 2019: 43). It is possible to stop the spread of disease through proper sanitation and effective cleaning of farms while providing animals with environments that fit their needs and interests. Many farmers are convinced that they need antibiotics to produce affordable meat and remain economically viable. However,

Kramer discovered that as consumers become more savvy, they demand antibiotic free-meat, and they are willing to pay for it (Singer et al. 2019). Raising meat and poultry without antibiotics can be accomplished at minimal cost to the consumer, about 5 cents extra per pound for pork and less than a penny per pound extra for chicken. While today, antibiotic-resistant infections cost United States of America at least $20 billion and steal thousands of lives each year (Singer et al. 2019). If it is possible to raise animals without the use of preventative antibiotics, then it is clear that because the only purpose of antibiotics used in this way is to enable wrongful conditions, that the non-therapeutic use of antibiotics is wrongful.

Therefore, in order to change an animal agriculture that is based on abuse, both at the animal level and the human level, we need to reform legislation and federal law. This is not unrealistic. There have been many legal changes within the last seven to eight years relating to promoting animal welfare, especially with lab animals. So why not farm animals? Why not antibitiotics? In the United States the US Congress passed two major pieces of legislation (Animal Welfare Act and Health Research Extension Act) regulating and constraining the use and treatment of animals in research in 1985, despite vigorous opposition from the biomedical research and medical lobbies, (Abd El-Hack 2020) who claimed that human health and medical progress would be harmed by implementation of such legislation. State laws passed in large numbers have increasingly prevented the use of live or dead shelter animals for biomedical research and training (Abd El-Hack 2020). Toxicological testing of cosmetics on animals has been truncated, and companies such as the Body Shop have been wildly successful internationally by totally disavowing such testing (Abd El-Hack 2020). Eight states have abolished the steel-jawed leghold trap. According to the director of the American Quarter Horse Association the number of state bills related to horse welfare sky rocketed in 1998 alone. Public sentiment for equine welfare in California carried a bill through state legislature, making the slaughter or shipping of horses for slaughter a felony in that state (Centner 2016). With the growing social concern for animal treatment in agriculture, it is possible that legal changes regarding the practices and treatment of farm animals in modern production systems is possible. In 1988, the Swedish Parliament passed, virtually unopposed, what the New York Times called a "Bill of Rights" for farm animals, abolishing in Sweden the confinement systems currently dominating North American agriculture (Centner 2016). Sow confinement has been banned in Sweden since 1988. And as I have already mentioned, the EU has placed many bans on preventative and growth promoting antibiotic use in animal agriculture. According to a Gallup Poll from May 19, 2003, fully 75 percent of the US public would like legislative assurance that farm animals are well cared for (Abd El-Hack 2020). In 2002, Farm Sanctuary and the HSUS spearheaded a ballot initiative that banned the use of gestation crates at Florida's pig farms.196 Thus, it is reasonable to expect that with the increasing societal demand for change in US agriculture, there can be legal bans on antibiotics similar to those that have occurred in Europe. A reform like this, in favor of more husbandry like practices to prevent spread of disease could certainly ease suffering in important ways.

CONCLUSION

Antimicrobial overuse affects animal welfare in ways that should be taken seriously as an ethical issue of major concern. The overuse of antibiotics whether in human medicine or in food animal feedlots has gained major attention by the medical community and the general public. Our concern is that if doctors continue to over-prescribe them, and if farmers continue to use them sub-therapeutically in animal feeds, we will be faced with grave health issues such as increased antimicrobial resistant bacteria in human beings. While this is an important issue, and one that has been taken up by many, what is also noteworthy, and what we take to be an important issue, are the ways in which the sub-therapeutic use of antibiotics in animal feeds poses a grave threat to animal health and welfare, too. We object to the use of antibiotics in animal feeds, not only because it affects human health, but insofar as it also promotes or makes possible farming practices that significantly harm animals, and has no independent value aside from doing so.

Factory farming as it is currently practiced is harmful to animals, and this gives us a reason to change factory farming. The sub-, or non-therapeutic use of antibiotics is one practice that is necessary for the preservation of current forms of factory farming, and provides no direct benefits to the animals. One

way to change farming practices in ways that lead to reduced harm to animals is to stop the sub- or non-therapeutic use of antibiotics, because they make unhealthy living conditions possible. Therefore, we have reason to stop the sub-, or non-therapeutic use of antibiotics. Along with antibiotics, both genetic and dietary approaches are just as morally objectionable and should not be used in industrial settings since they, too, allow for and perpetuate harmful farming practices to the detriment of animal welfare. Instead, a morally defensible replacement candidate for antibiotic misuse is improvement of husbandry practices. This caters to both human and animal interests. The question is, can we raise animals without antibiotics? The answer is, yes we can. It is possible to stop the spread of disease through proper sanitation and effective cleaning of farms while providing animals with environments that fit their needs and interests. Before World War II, feeding animals antibiotics was unnecessary as practicing proper animal husbandry and taking care of one's animals was conducive to good animal welfare and thus productivity. Improvements in production practices that reflect good animal welfare is something that we owe to animals, as they are beings with interests and needs that ought to be respected and protected in the same way that our interests and needs ought to be. And upon proper reflection of the costs and benefits tied to preventative antibiotic use, it is clear that more good than harm for both humans and animals involved will result if such a practice is stopped. Unfortunately, there will always be violence inherent in factory farming that reform cannot address, although, reform can help address some of it! But for change to take effect, all of us involved in the food chain need to take responsibility and implement action.

REFERENCES

1. Aaltola, E. (2012). *Animal Suffering: Philosophy and Culture*. *Animal Suffering: Philosophy and Culture*. doi:10.1057/9781137271822
2. Aaltola, E. (2013). Skepticism, Empathy, and Animal Suffering. *Journal of Bioethical Inquiry*, *10*(4), 457–467. doi:10.1007/s11673-013-9481-4
3. Abd El-Hack, M. E., Alagawany, M., Shaheen, H., Samak, D., Othman, S. I., Allam, A, Sitohy, M. (2020). Ginger and Its Derivatives as Promising Alternatives to Antibiotics in Poultry Feed. *Animals*, *10*(3), 452. doi:10.3390/ani10030452
4. Albala, K., & Rollin, B. E. (2015). Pew Commission on Industrial Farm Animal Production. In *The SAGE Encyclopedia of Food Issues*. doi:10.4135/9781483346304.n341
5. Antimicrobials. (2020). *Nature Biotechnology*, *38*(4), 416. doi:10.1038/s41587-020-0488-1
6. Bagno, O. A., Prokhorov, O. N., Shevchenko, S. A., Shevchenko, A. I., & Dyadichkina, T. V. (2018). Use of phytobioticts in farm animal feeding. *Sel'skokhozyaistvennaya Biologiya*. doi:10.15389/agrobiology.2018.4.687eng
7. Bartelt, D. A. (2014). Antibiotic-resistant pathogens. *The Nurse Practitioner*, *39*(8), 19–21. doi:10.1097/01.npr.0000451910.48050.1b
8. Bernal-Barragán, H., Cerrillo-Soto, M. A., García-Mazcorro, J. F., Juárez-Reyes, A. S., & Salem, A. Z. M. (2013). Antibiotics in animal nutrition. In *Nutritional Strategies of Animal Feed Additives* (pp. 25–46).
9. Betzig, L. (2012). Means, variances, and ranges in reproductive success: Comparative evidence. *Evolution and Human Behavior*, *33*(4), 309–317. doi:10.1016/j.evolhumbehav.2011.10.008
10. Bruce, S., & Yearley, S. (2014). Phylogenetic Scale. In *The SAGE Dictionary of Sociology*. doi:10.4135/9781446279137.n733
11. Centner, T. J. (2016). Efforts to slacken antibiotic resistance: Labeling meat products from animals raised without antibiotics in the United States. *Science of the Total Environment*. doi:10.1016/j.scitotenv.2016.05.082
12. Davies, J. (2006). Are antibiotics naturally antibiotics? In *Journal of Industrial Microbiology and Biotechnology* (Vol. 33, pp. 496–499). doi:10.1007/s10295-006-0112-5
13. DeGrazia, D. (2012). Animals' moral status and the issue of equal consideration. In *Taking Animals Seriously* (pp. 36–74). doi:10.1017/cbo9781139172967.003
14. Finkelman, R. D., & Polson, A. M. (2015). Local antimicrobials. *Journal of the American Dental Association*. doi:10.1016/j.adaj.2015.08.003

15. Francione, G. (2015). Equal Consideration and the Interest of Nonhuman Animals in Continued Existence: A Response to Professor Sunstein. *University of Chicago Legal Forum*, *2006*(1), 8.
16. Francione, G. L. (2018). Reflections on Tom Regan and the Animal Rights Movement That Once Was. *Between the Species*, *21*(1), 1–41. Retrieved from http://digitalcommons.calpoly.edu/bts/
17. Grandin, T., & Deesing, M. (2002). Distress in Animals : Is it Fear, Pain or Physical Stress ? *American Board of Veterinary Practitioners - Symposium*, *11*, 1–7.
18. Hancock, R. E. W., & Strohl, W. R. (2001). Antimicrobials: Antimicrobials in the 21st century. *Current Opinion in Microbiology*, *4*(5), 491–492.
19. Katz, S. E., & Ward, P. M. L. (2005). Antibiotic residues in foods and their significance. In *Antimicrobials in Food, Third Edition* (pp. 599–619). doi:10.1201/9781420028737.ch18
20. Lindsay, R. A. (2017). Animals, Moral Status, And The Objectives Of Morality. *Think*, *16*(47), 33–43. doi:10.1017/s1477175617000197
21. Marinelli, F., & Tomasz, A. (2010). Antimicrobials. *Current Opinion in Microbiology*. doi:10.1016/j.mib.2010.09.010
22. Morton, D. B. (2000). Self-consciousness and animal suffering. *Biologist*, *47*(2), 77–80.
23. Ogar, J. N., Ogar, T. E., & Anyim, M. N. M. (2016). Selected Issues in Biomedical Ethics and its Social Implications: African Consideration. *International Journal of Research*, *5*.
24. Ojong, L. O. (2019). Singer's Notion Of Speciesism: A Case For Animal Rights In Ejagham Culture. *International Journal of Environmental Pollution and Environmental Modelling*, 116-121.
25. Papapetropoulou, M., & Mavridou, A. (2018). Emerging bacterial pathogens in bottled water. *Acta Microbiologica Hellenica*.
26. Refsdal, A. O. (2000). To treat or not to treat: A proper use of hormones and antibiotics. In *Animal Reproduction Science* (Vol. 60–61, pp. 109–119). doi:10.1016/S0378-4320(00)00094-4
27. Regan, T. (1990). Christianity and Animal Rights: The Challenge and Promise. In *Liberating Life: Contemporary Approaches in Ecological Theology* (pp. 73–87). Retrieved from http://www.religion-online.org/showarticle.asp?title=2326
28. Robbins, P. (2014). Union of Concerned Scientists (UCS). In *Encyclopedia of Environment and Society*. doi:10.4135/9781412953924.n1113
29. Rowlands, M. (1998). Tom Regan: Animal Rights as Natural Rights. In *Animal Rights* (pp. 87–119). doi:10.1007/978-1-349-26780-4_5
30. Rowlands, M. (2020). The Moral Animal. In *The Routledge Handbook of Animal Ethics* (pp. 83–91). doi:10.4324/9781315105840-8
31. Singer, R. S., Porter, L. J., Thomson, D. U., Gage, M., Beaudoin, A., & Wishnie, J. K. (2019). Raising Animals Without Antibiotics. *Frontiers in Veterinary Science*, *6*. doi:10.3389/fvets.2019.00452
32. Smith, R. A., M'ikanatha, N. M., & Read, A. F. (2015). Antibiotic Resistance: A Primer and Call to Action. *Health Communication*, *30*(3), 309–314. doi:10.1080/10410236.2014.943634
33. USDA. (2015). *Coffee : World Markets and Trade*. *Coffee: world markets and trade*. Retrieved from http://www.fas.usda.gov/psdonline/circulars/coffee.pdf
34. Waldrop, G. L. (2009). Smaller is better for antibiotic discovery.*ACS Chemical Biology*, *4*(6), 397–399. doi:10.1021/cb900122j
35. Whitney, D. L., Evans, B. W., Vega-Granillo, R., Vidal-Solano, J. R. J. R., Herrera-Urbina, S., Sanchez Uribe, J., … Alle. (2014). Acrobatics (Dex) Total. *Chemical Geology*, *50*(1-2), 1–2. doi:10.1017/CBO9781107415324.004
36. Wildfire, A. (2017). Anticipating the next Influenza Vaccine - A viral challenge based on data. *Pharmaceutical Outsourcing*, *18*(5).
37. Woappi, Y., Gabani, P., Singh, A., & Singh, O. V. (2016). Antibiotrophs: The complexity of antibiotic-subsisting and antibiotic-resistant microorganisms. *Critical Reviews in Microbiology*. doi:10.3109/1040841X.2013.875982
38. Wohlleben, W., Mast, Y., Stegmann, E., & Ziemert, N. (2016). Antibiotic drug discovery. *Microbial Biotechnology*, *9*(5), 541–548. doi:10.1111/1751-7915.12388
39. Zuolo, F. (2019). Misadventures of sentience: animals and the basis of equality. *Animals*, *9*(12). doi:10.3390/ani9121044