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The Greening of the Papacy

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Catholic Social Teaching, Ecology, and Food Ethics

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Introduction

Recent papal teaching has made many important contributions to ecological reflection within the church and the broader world. At the same time, there are major aspects of our ecological situation that have gone largely unaddressed. This paper will first briefly highlight some of the positive contributions of papal teaching on ecology, and then will explore one important dimension of life that is in need of further attention, namely the dietary choices that we make. These food choices, as we will see, are among the most significant ecological decisions that are under our direct personal control.

The contributions of recent popes to reflection on ecological topics have been numerous. At the most basic level, the popes have highlighted the profound urgency of issues such as climate change and emphasized the centrality of ecological concern in a proper understanding of Catholic faith. "Today the ecological crisis has assumed such proportions as to be the responsibility of everyone," said Pope John Paul II in his 1990 World Day of Peace message. "Christians, in particular realize that their responsibility within creation and their duty towards nature and the Creator are an essential part of their faith"

(1989: 15). Pope Benedict XVI has made similar claims. "Preservation of the environment, promotion of sustainable development, and particular attention to climate change," says Benedict, "are matters of grave concern for the entire human family" (2007b). "Our earth is talking to us," Benedict warns, "and we must listen to it and decipher its message if we want to survive" (Catholic News Agency).

Along with stressing the urgency of contemporary ecological crises, another major contribution of papal teaching has been to highlight the inextricable connection between concern for ecology and concern for social justice. "[T]he proper ecological balance will not be found," says Pope John Paul II, "without directly addressing the structural forms of poverty that exist throughout the world"(1989: 11). This is so both because the poor often suffer most from ecological degradation and pollution, and because poverty often causes the poor to engage in ecologically harmful acts for the sake of short-term survival, such as depleting soil or cutting down trees.

Any adequate response to ecological crisis and social injustice must be characterized, the popes contend, by both structural and personal change. There is the need, says Pope John Paul II, for "a change of lifestyles, of models of production and consumption, and of the established structures of power which today govern societies" (1991: 58). Similarly, Pope Benedict speaks of the need to "change our way of life, . . . eliminate the structural causes of global economic dysfunction, and to correct models of growth that seem incapable of guaranteeing respect for the environment and for integral human development" (2007a). Elaborating further upon the need for lifestyle change, John Paul II states: "Modern society will find no solution to the ecological problem unless it takes a serious look at its lifestyle. Simplicity, moderation, and discipline, as well as a spirit of sacrifice, must become a part of everyday life, lest all suffer the negative consequences of the careless habits of a few" (1989: 13). Benedict strongly reaffirms these claims. "It is becoming more and more evident," says Benedict, "that the issue of environmental degradation challenges us to examine our lifestyle and the prevailing models of consumption and production, which are often unsustainable from a social, environmental, and even economic point of view. We can no longer do without a real change of outlook which will result in new lifestyles" (2009: 11).

All of these insights of recent papal teaching are of great value. At the same time, I would contend that there are certain weaknesses in the tradition. For example, the inherent value of non-human parts of creation is often not adequately recognized and affirmed. Pope John Paul II, for example, approvingly cites a statement made in the Vatican II document *Gaudium et Spes* which asserts that "man is the only creature on earth that God willed for its own sake" (1991: 53). This claim, I would argue, is contrary to the biblical tradition, which affirms the goodness of each part of creation prior to and apart from the creation of humans (see Genesis 1). While it is certainly correct to say that the Bible affirms a central and unique role for humans, the Bible does not deny that other parts of creation have inherent value in the eyes of God. This recognition of the inherent value of other parts of creation, it should be noted, is affirmed by the U.S. Catholic bishops in their document *Renewing the Earth*. "[I]t is appropriate," the bishops state, "that we treat other creatures and the natural world not just as means to human fulfillment but also as God's creatures, possessing an independent value, worthy of our respect and care" (1991: 5). The inclusion of such a statement in the papal documents would further enhance Catholic teaching on ecological issues.

Another suggestion for further development in papal ecological reflection is to move beyond the level of generalities. Papal teaching, for example, rightly stresses the need to live in more ecologically sustainable ways, including undertaking major lifestyle changes, but it does not provide much practical guidance as to specific changes that may be necessary. It is here that I believe greater attention to issues such as our food choices would be very valuable.

There are many dimensions of our food choices that could be highlighted. Some of these have received at least cursory attention in Catholic social teaching. For example, papal statements and U.S. bishops' statements have addressed the need to minimize the use of pesticides and other chemicals in agriculture, citing concern about ecological and health impacts (see USCCB 2003: 31-32). Similarly, some attention has been given to issues of "fair trade" and the importance of supporting forms of trade and agriculture in which farmers and farm workers are justly compensated for their work and have working conditions that are respectful of human dignity (see USCCB 2003: 20-26). At the same time, other important issues related to food production and dietary choice and the ecological impacts of such choices go largely unmentioned. In particular, there has been in CST an almost total lack of attention to the ecological impacts of the production and consumption of meat and other animal products.

The ecological impacts of livestock production are profound. For example, a recent United Nations report entitled *Livestock's Long Shadow* found that the global livestock industry is responsible for more greenhouse gas emissions than all forms of transportation combined, an astounding and little known reality (see FAO). How can it be possible that livestock production is such a major contributor to climate change? To understand this and the numerous other negative ecological impacts of the production of meat and other animal products requires a closer look at the many dimensions of the contemporary livestock industry. The first reality to be aware of is the increasing predominance of "factory farms" or what the industry prefers to call "concentrated animal feeding operations" (CAFOs). In these operations huge numbers of animals are confined in very limited space. For example, a facility housing broiler chickens or laying hens may hold 100,000 or more birds. These conditions, of course, have profoundly negative implications for animal welfare. Laying hens, for example, are generally crammed together so tightly in cages that they cannot even open their wings, often six birds or more in a cage the size of an opened sheet of newspaper. Because they try to peck each other, the tips of their beaks are cut off. Due to their inability to move around, their feet often grow around the bars of the cage. Similarly, other animals are intensely confined, subjected to numerous painful procedures, and have many of their most basic instincts frustrated. Pigs, for example, have no opportunities for nest-building, rooting, or typical pig family life. Pregnant pigs are generally confined for the duration of their pregnancy in a crate so small that they cannot even turn around. These conditions, it should be noted, are not aberrations, but rather are the standard conditions in which the vast majority of livestock animals are currently raised in the United States and increasingly in other parts of the world as well (see Imhoff; Kirby).

In addition to the negative implications for animal welfare, there is a wide array of detrimental ecological impacts of these factory farm livestock operations. One example of this is the internal ecology of the factory farms themselves. The air, for example, is generally

highly laden with ammonia, hydrogen sulfide, and other toxic fumes from the animals' urine and excrement, contributing to health problems for both the humans who work there and the non-human animals that are confined in these facilities. Similarly, there is the danger of exposure to toxic bacteria transmitted through the animals' wastes. These factory farm operations also negatively affect the ecology of the immediate surrounding communities, often being responsible for extensive pollution of air and water supplies (see Kirby).

The negative ecological impacts of factory farms (and of other, seemingly more benign, forms of animal raising) also go far beyond these local impacts to broader and more systemic considerations. The various negative ecological impacts of the livestock industry were the focus of the 2006 report of the United Nations Food and Agriculture Organization (FAO), *Livestock's Long Shadow: Environmental Issues and Options*. "The livestock industry," the UN report stated, "emerges as one of the top two or three most significant contributors to the most serious environmental problems, at every scale from the local to the global" (xx). Among the livestock-related problems highlighted in the report are high levels of fossil fuel usage, massive contributions to global climate change, air pollution, deforestation, loss of biodiversity, land degradation, water scarcity, and water pollution.

Fossil Fuel Usage

According to a study by geophysicists at the University of Chicago, it takes on average approximately 50 calories of fossil fuel energy to produce 100 calories of food energy from plant-based (vegan) sources. In contrast, it takes approximately 500 calories of fossil fuel energy to produce 100 calories of factory-farm chicken or milk. In other words, it takes about 10 times as much fossil fuel energy to produce the chicken or milk as to produce the vegan food. It takes even more fossil fuel energy to produce grain-fed beef, approximately 32 times more than needed for the vegan food (Jacobsen: x). Other studies, focusing on protein content, have shown similar results. It is estimated, for example, that it takes on average 54 calories of fossil fuel to produce 1 calorie of protein from grain-fed beef whereas producing 1 calorie of protein from soybeans would require only 2 calories of fossil fuel energy, about 1/27 of the energy needed to produce the beef (Robbins: 266).

Climate Change

With regard to climate change, the United Nations' *Livestock's Long Shadow* report reveals the surprising fact, mentioned above, that the livestock industry is responsible for more greenhouse gas emissions than all forms of transportation (cars, trucks, airplanes, etc.) combined! (FAO: xxi).[1] This contribution to greenhouse gas emissions takes numerous forms, including the vast amounts of energy that are used to produce all of the crops that are fed to livestock, massive deforestation in order to use the land to graze cattle or grow animal feed (releasing huge quantities of carbon as the trees decay), the heavy use of energy in

[1] The FAO estimates that the meat industry accounts for nearly one-fifth (approximately 18%) of total greenhouse gases measured in CO_2 equivalents. It is responsible for an estimated 9% of anthropogenic (i.e. human-caused) CO_2, 37% of anthropogenic methane, and 65% of anthropogenic nitrous oxide. Analysts associated with the World Bank have suggested that the FAO overlooked significant additional sources of livestock-related greenhouse gas emissions, claiming that the actual contribution of the livestock industry to greenhouse gas emissions is more than double what the FAO estimated (see Goodland and Anhang).

factory farms, and the highly potent greenhouse gases that are emitted by the animals themselves and from their decaying manure. Ruminants such as cows and sheep, for example, emit huge quantities of methane especially through burping and flatulence. Methane is also a by-product of the anaerobic decomposition of manure. Methane is 23 times as strong of a greenhouse gas as carbon dioxide. Nitrous oxide, an even stronger greenhouse gas with 296 times the global warming potential of carbon dioxide, is released in large quantities from the decomposition of manure and is also a by-product of the synthetic fertilizers typically used in growing animal feed.

Because methane cycles fairly quickly out of the atmosphere in comparison with other greenhouse gases and meat production is a main cause of methane, it has been argued that one of the quickest ways to reduce human impacts on global warming would be through reduced meat consumption, especially consumption of cows, which would result in smaller numbers of the animals being raised.

Overall, it has been estimated in a study by two University of Chicago geophysicists that switching from a standard American diet to a vegan diet would result a reduction per person of about 1.5 tons of CO_2 equivalents each year. This, it should be noted, is a 50% greater greenhouse gas reduction than would be obtained in a year by driving a hybrid Toyota Prius instead of a standard U.S. sedan for the typical amount of miles driven annually in the United States (data cited in Rysavy). Another report, by researchers at Carnegie Mellon University in Pittsburgh, has concluded that eliminating meat and dairy products from one's diet for even one day a week would have as much of a beneficial ecological impact as would purchasing 100% of one's food from local sources (see Weber and Matthews).

Dr. Rajendra Pachauri, the chair of the UN's Intergovernmental Panel on Climate Change (IPCC), the world's most distinguished body of climate change experts, has issued a strong call for a reduction in meat consumption. "Please eat less meat," he has pleaded, emphasizing that "meat is a very carbon intensive commodity" (Agence France-Presse). "In terms of immediacy of action and the feasibility of bringing about reductions in a short period of time," Pachauri states, "it [reduced meat consumption] clearly is the most attractive opportunity" (Jowitt). James Hansen, director of NASA's Goddard Institute of Space Studies, arguably the most prominent climate scientist in the United States, makes a similar claim: "If you eat further down on the food chain rather than animals, which have produced many greenhouse gases, and used much energy in the process of growing that meat, you can actually make a bigger contribution in that way than just about anything. So, that, in terms of individual action, is perhaps the best thing you can do."

Deforestation and Loss of Biodiversity

The livestock industry is also a primary driver of deforestation, exceeding by far any other cause. It is estimated, for example, that approximately 70 percent of previously forested land in the Amazon is now occupied by pasture, and crops to be used as animal feed cover a large part of the remainder (FAO: xxi). While logging and small-scale farming by poor people denied access to better land elsewhere play lesser roles, the vast majority of rainforest destruction in the Amazon has been connected with the meat industry. Similar patterns of forest destruction prevail in various other locales as well. This destruction of rainforest and other forested land not only exacerbates global warming but is also a primary

contributor to loss of biodiversity through habitat destruction. The livestock industry also contributes to biodiversity loss through various forms of air and water pollution, desertification (caused especially by overgrazing on marginal land), overfishing (about 1/4 of the world's fish catch is fed to livestock), and other causes. "[T]he livestock sector may well be the leading player in the reduction of biodiversity," states the report *Livestock's Long Shadow*, "since it is the major driver of deforestation, as well as one of the leading drivers of land degradation, pollution, climate change, overfishing, sedimentation of coastal areas and facilitation of invasion by alien species" (FAO: xxiii; for detailed discussion of the livestock industry and biodiversity loss, see 181-218).

Land Degradation

Along with deforestation and desertification, the livestock industry contributes to land degradation in numerous other ways. Production of livestock feed crops, for example, is a major contributor to soil erosion and to the toxic contamination of soil with agricultural chemicals. Also, the animals themselves, especially cattle, often severely degrade the soil that they walk on through both compaction and contributions to erosion (see Jacobsen: 73-85).

Water Usage and Water Pollution

The raising of livestock requires massive amounts of water, especially for the irrigation of feed crops and pasture and in the daily operations of factory farms. It is estimated that a typical pound of U.S. beef requires about 2500 gallons of water to produce. In contrast, a typical pound of potatoes takes only about 24 gallons of water to produce, the beef thus requiring about 100 times as much water as the potatoes (Robbins: 236). It is expected that by the year 2025 approximately 64% of the world's population will live in water-stressed basins, thus making a diet with high water demand increasingly problematic (FAO: xxii).

In addition to high water usage, the livestock industry is also one of the main polluters of water. This takes the forms especially of pollution caused by the agricultural chemicals used in growing animal feed and the waste products of the massive feedlots and factory farm operations, discussed above. A typical factory farm can produce an amount of excrement and urine similar to that of a small city, but without the sanitation regulations that pertain to human waste. Livestock in the United States, for example, produce 130 times as much waste as does the human population (Ayres). Much of this waste ends up in the local waters, either by seepage from lagoons where it is stored or by being sprayed onto fields and then running off into the waters when it rains. From there it may travel downstream causing additional problems elsewhere. The UN study declares that the livestock industry "is probably the largest sectoral source of water pollution, contributing to eutrophication, 'dead zones' in coastal areas, degradation of coral reefs, human health problems…and many others. The major sources of pollution are from animal wastes, antibiotics and hormones, chemicals from tanneries, fertilizers and pesticides used for feed crops, and sediments from eroded pastures" (FAO: xxii; see also 125-79; Jacobsen: 87-101).

Discussing the overall environmental impacts of livestock production, the Worldwatch Institute, publisher of the highly respected annual *State of the World* reports, declares: "[A]s environmental science has advanced, it has become apparent that the human appetite for animal flesh is a driving force behind virtually every major category of environmental

damage now threatening the human future – deforestation, erosion, fresh water scarcity, air and water pollution, climate change, biodiversity loss, social injustice, the destabilization of communities, and the spread of disease" (Worldwatch: 12).

In addition to ecology and conditions for animals, numerous other impacts of the livestock industry could also be discussed, such as impacts on workers, rural communities, and human health, though most of these would go beyond the scope of this volume.[2] One additional topic that deserves at least brief attention, however, is the connection with world hunger. Currently, the world produces far more food than is needed to feed the total world population, yet over a billion people, about 1/7 of the world's population, are chronically malnourished. The number of those hungry has risen significantly in recent years, due especially to rising prices for grains and other basic foods. A major contributing factor to this price rise has been increased global meat consumption. Why is this the case? It arises from the fact that the conversion of grains, beans, and other food products into meat is enormously inefficient. It is estimated, for example, that it takes approximately 12-16 pounds of grain fed to feedlot cattle to produce 1 pound of meat (Robbins: 293). Ratios for other animals are lower, but in all cases there is significant inefficiency. The average ratio for commonly raised livestock is estimated to be between 6:1 and 8:1. This results in a massive loss of the nutritional content that is available for human consumption. For example, with regard to protein, it is estimated that it takes an average of 6 lbs. of grain/bean protein fed to an animal to produce 1 lb. of animal protein. This involves a loss of protein available for human consumption of around 83% (Pimentel and Pimentel: 661S). It is therefore the case that many more people can be fed if grains, beans, and other food items are consumed directly by humans than if these foods are cycled through livestock. This wastefulness of modern meat production is the central (and often overlooked) factor that explains what happens to all the "extra" food that the world currently produces, causing unnecessary food shortages, driving up food prices, and contributing to hunger.[3]

Catholic Social Teaching and Food Ethics

It seems clear that a strong moral case can be made against factory farm meat production on the basis of concern for world hunger, ecology, the rights of workers, and the humane treatment of animals. Principles of Catholic Social Teaching such as an option for the poor, an affirmation that the goods of the earth belong to all, the dignity of labor, and the call to ecological concern and the avoidance of cruelty provide compelling reasons for avoiding meat (and dairy products and eggs) produced in factory farm conditions.

Despite the implications of these principles, however, the issue remains largely unexplored in Catholic Social Teaching documents. Pope Benedict did call into question factory farm conditions for animals in response to a direct question in an interview he gave

[2] For excellent overviews of the wide array of impacts of the livestock industry (on ecology, animals, world hunger, workers, human health, etc.), see Robbins; Singer and Mason; Kneidel and Kneidel.

[3] It should be noted that raising animals entirely on pasture does not have a negative impact on human food supply if the land being used for pasture is truly unsuitable for crop production. Only a tiny fraction of the world's current livestock production, however, meets these criteria. And even in these cases there are ecological and other ethical issues to be considered, as will be discussed below.

prior to becoming pope. "Certainly," Cardinal Ratzinger said, "a sort of industrial use of creatures, so that geese are fed in such a way as to produce as large a liver as possible, or hens live so packed together that they become just caricatures of birds, this degrading of living creatures to a commodity seems to me in fact to contradict the relationship of mutuality that comes across in the Bible" (78-79). I am not aware, however, that Pope Benedict has made any further comments on this topic since becoming pope. The U.S. bishops made a brief comment in their 2003 document on farming entitled *For I Was Hungry and You Gave Me Food*: "Catholic teaching about the stewardship of creation leads us to question certain farming practices, such as the operation of massive confined animal feeding operations" (USCCB: 31). They did not elaborate much on this comment, however, and to my knowledge have not addressed the issue again since that time.

Non-Factory Farm Livestock Production and the Environment

An important question that arises out of this discussion is, "What about non-factory farm livestock production?" Are there forms of meat production that are ethically acceptable? In recent years many critics of factory farms have called for a return to non-factory farm methods of animal raising, such as raising animals on pasture. It is claimed that these forms of production are more ecologically positive as well as being more humane in their treatment of animals.

As to the ecological issues, the evidence is mixed. Pasture-based systems certainly do avoid or minimize some of the negative impacts of factory farms, such as those associated with huge, concentrated stockpiles of animal wastes and all of the energy that is needed to grow feed for factory farm animals. Yet pasture-based systems also contribute to ecological problems. For example, numerous studies have shown that the production of grass-fed beef actually results in significantly higher emissions of methane (which, as we have seen, is a highly potent greenhouse gas) than does factory farm-produced beef. There are two main reasons for this. One is that the digestion of cellulose-rich roughage such as grass results in a larger amount of methane by-products than the digestion of grains such as corn. The other is that grass-fed animals gain weight more slowly than animals fed grain and beans and so take longer to reach the weight at which they are slaughtered, allowing more emissions to accumulate over their lifetime. Overall, it is estimated that grass-fed beef is responsible for approximately 50% more overall greenhouse gas emissions per pound of meat produced than factory-farm beef (see Raloff). And there are additional negative ecological impacts that are often connected with grass-fed beef as well, such as compaction of soil, desertification due to overgrazing, contamination of water sources with fecal matter, deforestation in order to use land for grazing, and the destruction of native wildlife habitat, among others (see Wuerthner and Matteson).

Overall, while a strong case can be made on a variety of grounds for the preference of raising cows and other animals on pasture or in barnyards rather than in factory farms if meat is to be consumed, the most ecological food option in most circumstances is to significantly reduce or eliminate the consumption of meat entirely. According to Christopher Flavin, president of the Worldwatch Institute, "There is no question that the choice to become a vegetarian or lower meat consumption is one of the most positive lifestyle changes a person could make in terms of reducing one's personal impact on the environment" (*E*

Magazine). Clear recognition of this fact in Catholic Social Teaching would significantly strengthen the tradition's engagement with ecological issues.

As to the treatment of animals, even non-factory farm methods of livestock raising often involve various problematic practices. For example, many animals still suffer from inadequate space (e.g., in outdoor movable pens) and are subjected to various painful procedures such as branding, debeaking, dehorning, and castration without anesthesia. Also, the male chicks of egg-laying hens are generally killed at birth, even in the organic, free-range egg industry, since they are deemed to lack any economic value, being a different breed than those chickens raised for meat. Male dairy calves from non-factory farm dairies are still generally separated from their mothers shortly after birth, and some are sold to be raised in brutal conditions for veal. In addition, at the end of their lives even non-factory farm animals are transported to slaughterhouses (a very traumatic experience for the animals) and then killed against their will, almost always at a very young age. Pigs, for example, are generally slaughtered around the age of 5-6 months, about 1/20 of what a normal pig lifespan could be. In conditions where viable alternatives are available, should not Christians opt for the path of compassion and mercy and refrain from such harms and killing?

"To kill without the strict conditions of necessity," asserts Oxford University theologian Andrew Linzey, "is to live a life with insufficient generosity" (135). "What does it say about us," asks Colleen Patrick-Goudreau, "that when given the opportunity to prevent cruelty and violence, we choose to turn away – because of tradition, culture, habit, convenience, or pleasure?" Christians are called to incarnate the love and compassion of God and to be witnesses to the Kingdom of God. Just as the Bible begins with a vision of a vegetarian humanity, so too the eschatological vision of the biblical prophets speaks of a peaceable kingdom in which humans and animals live together without harm or violence. The letters of Paul in the New Testament likewise speak of the redemption and reconciliation of all creation, a vision that is not confined merely to humanity. By living a life that rejects unnecessary violence, including unnecessary violence against animals, Christians can be a living sign of this Kingdom. As Stanley Hauerwas and John Berkman state, Christian vegetarianism can be a powerful "witness to the world that God's creation is not meant to be at war with itself" (72). Such a vegetarian lifestyle, assert Stephen Kaufman and Nathan Braun of the Christian Vegetarian Association, is "an important personal step toward living according to God's will, . . . respecting and caring for our own bodies, the environment, hungry people, and animals" (58). As such, it is a compelling way to exhibit responsible stewardship and to give honor to our Creator.

Bibliography

Agence France-Presse

2008 "Lifestyle Changes Can Curb Climate Change: IPCC Chief." Available online at http://afp.google.com/article/ALeqM5iIVBkZpOUA9Hz3Xc2u-61mDlrw0Q.

Ayres, Ed

1999 "Will We Still Eat Meat?" *Time* (November 8). Available online at http://www.time.com/time/magazine/article/0,9171,992523,00.html.

Benedict XVI

2007a Address to the Diplomatic Corps Accredited to the Holy See (January 8). Available online at http://www.vatican.va/holy_father/benedict_xvi/speeches/2007/january/documents/hf_ben-xvi_spe_20070108_diplomatic-corps_en.html.

2007b "Letter to Bartholomew I, Ecumenical Patriarch of Constantinople, on the Occasion of the Seventh Symposium of the Religion, Science, and the Environment Movement" (September 1). Available online at http://www.zenit.org/article-20435?l=english.

2009 "If You Want to Cultivate Peace, Protect Creation." Message for the 43rd World Day of Peace 2010. Available online at http://www.vatican.va/holy_father/benedict_xvi/messages/peace/documents/hf_ben-xvi_mes_20091208_xliii-world-day-peace_en.html.

Catholic News Agency

2007 "Pope Calls for Protection of Environment, Says Creation-Evolution Debate is 'Absurdity'" (July 26). Available online at http://www.catholicnewsagency.com/news/pope_calls_for_protection_of_environment_says_creationevolution_debate_is_absurdity.

E The Environmental Magazine

2008 Earthtalk column (February 24). Available online at http://www.emagazine.com/includes/print-article/earth-talk-archive/1146.

Food and Agriculture Organization (FAO)

2006 *Livestock's Long Shadow: Environmental Issues and Options*. Rome: FAO. Available online at http://www.fao.org/docrep/010/a0701e/a0701e00.htm.

Goodland, Robert, and Jeff Anhang

2009 "Livestock and Climate Change." Available online at http://www.worldwatch.org/files/pdf/Livestock%20and%20Climate%20Change.pdf.

Hansen, James

2009 Interview. Available online at http://veg4planet.blogspot.com/2009/02/dr-james-hansenwe-have-only-four-years.html.

Hauerwas, Stanley, and John Berkman.

1993 "A Trinitarian Theology of the 'Chief End' of 'All Flesh.'" Pp. 62-74 in *Good News for Animals? Christian Approaches to Animal Well-Being*. Edited by Charles Pinches and Jay McDaniel. Maryknoll: Orbis.

Imhoff, Daniel, editor

2010 *The CAFO Reader: The Tragedy of Industrial Animal Factories*. Berkeley: University of California Press.

Jacobsen, Michael

2006 *Six Arguments for a Greener Diet: How a More Plant-Based Diet Could Help Save Your Health and the Environment*. Washington, D.C.: Center for Science in the Public Interest.

John Paul II

1989 "Peace with God the Creator, Peace with All Creation." Message for the 1990 World Day of Peace. Available online at http://www.vatican.va/holy_father/john_paul_ii/messages/peace/documents/hf_jp-ii_mes_19891208_xxiii-world-day-for-peace_en.html.

1991 *Centesimus Annus*. Available online at http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_01051991_centesimus-annus_en.html.

Jowitt, Juliette

2008 "UN Says Eat Less Meat to Curb Global Warming." *The Observer* (September 7). Available online at http://www.guardian.co.uk/environment/2008/sep/07/food.foodanddrink.

Kaufman, Stephen, and Nathan Braun

2004 *Good News for All Creation: Vegetarianism as Christian Stewardship*. Cleveland: Vegetarian Advocates.

Kirby, David

2010 *Animal Factory: The Looming Threat of Industrial Pig, Dairy, and Poultry Farms to Humans and the Environment*. New York: St. Martin's.

Kneidel, Sally, and Sara Kate Kneidel

2005 *Veggie Revolution: Smart Choices for a Healthy Body and a Healthy Planet*. Golden: Fulcrum.

Linzey, Andrew

1995 *Animal Theology*. Urbana: University of Illinois Press.

Patrick-Goudreau, Colleen

2006 "From Cradle to Grave: The Facts Behind 'Humane' Eating." *Satya* (September) Available online at http://www.satyamag.com/sept06/goudreau.html.

Pimentel, David, and Marcia Pimentel

2003 "Sustainability of Meat-Based and Plant-Based Diets and the Environment." *American Journal of Clinical Nutrition* 78, 3: 660S-63S.

Raloff, Janet

2009 "AAAS: Climate Friendly Dining . . . Meats: The Carbon Footprints of Raising Livestock for Food." *ScienceNews* (February 15). Available online at http://www.sciencenews.org/view/generic/id/40934/title/Science_%2B_the_Public__AAAS_Climate-friendly_dining_%E2%80%A6_meats.

Ratzinger, Joseph Cardinal

2002 *God and the World: A Conversation with Peter Seewald*. San Francisco: Ignatius.

Robbins, John

2001 *The Food Revolution: How Your Diet Can Help Save Your Life and the World*. Berkeley: Conari.

Rysavy, Tracy Fernandez

2007 "Eat Less Meat, Cool the Planet." *Green America* (September/October). Available online at http://www.greenamerica.org/livinggreen/lessmeat.cfm.

Singer, Peter, and Jim Mason

2006 *The Ethics of What We Eat: Why Our Food Choices Matter*. Emmaus: Rodale.

U.S. Conference of Catholic Bishops (USCCB)

1991 *Renewing the Earth: An Invitation to Reflection and Action on Environment in Light of Catholic Social Teaching*. Washington, D.C.: USCCB.

2003 *For I Was Hungry and You Gave Me Food: Catholic Reflections on Food, Farmers, and Farmworkers*. Washington, D.C.: USCCB.

Vatican II Council

1965 *Gaudium et Spes*. Available online at http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19651207_gaudium-et-spes_en.html.

Weber, Christopher, and H. Scott Matthews

2008 "Food Miles and the Relative Climate Impact of Food Choices in the United States." *Environmental Science and Technology* 42, 10: 3508-13.

Worldwatch Institute

2004 "Meat: Now It's Not Personal, But Like It or Not, Meat-Eating is Becoming a Problem for Everyone on the Planet." *Worldwatch Magazine* 17, 4: 12-20. Available online at http://www.worldwatch.org/system/files/EP174A.pdf.

Wuerthner, George, and Mollie Matteson, editors

2002 *Welfare Ranching: The Subsidized Destruction of the American West*. Washington, D.C.: Island.