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Mindless Meat: An Exploration of Meat's Role in Environmental Degradation and World Hunger

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Mindless Meat:

An Exploration of Meat's Role in
Environmental Degradation and World Hunger

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Abstract

Consider the humble hamburger. From start to finish, a pound of beef represents about a gallon of gasoline used, 13 pounds of feed, and over 2,400 gallons of water. This paper focuses on problems such as environmental degradation and world hunger that are exacerbated by heightened global demand and production of meat. Research centers around reports by the Committee on World Food Security, as well as organizations like the Food and Agriculture Organization of the United Nations and the World Health Organization. The paper utilizes three disciplines while addressing the problem: (1) the historical origins of industrial beef production, (2) the politics of beef production and how the government's compliance has created one of the most powerful global industries, and (3) the economic effects of meat production in relation to diverted food production and world hunger. This thesis explores the implications of meat production, with a specific focus on Brazil, both as an ecologically diverse area, and as a country surrounded by food insecurity and poverty in the greater region of South America. Potential policy implementations reflect meat consumption patterns in other cities and regions. Using the three disciplines, the paper attempts to provide educational, scientific, and economic validation to pursue more sustainable agricultural practices, especially those that exclude the production of meat.

Table of Contents

Introduction: The True Cost of Meat

Chapter 1: Crunching Numbers: Meat's Environmental & Humanitarian Disconnect

Chapter 2: Meat's Maker: The Growth of Farming, Feed & Meat

Chapter 3: We've Got Beef: Politics As a Driver in Beef Production

Chapter 4: Palate, Privilege & Poverty: The Far-Reaching Consequences of the Burger

Chapter 5: Moo-ving Forward: Practical Food Policy

Bibliography

Introduction: The True Cost of Meat

Few relationships have had more significance and lasting impact on global history as the relationship between humans and cattle. Cows, long revered by ancient civilizations as gods and goddesses of strength, virility, and new life, have had an evolving role in human cultures throughout the ages.

As cows went from sacred figures to pre-packaged commodities, the nature of agriculture changed rapidly, both for farms in the United States and around the world. Our relationship to these animals has played a large role in the changing cultural landscape of the American West, in the dining rooms of Britain, and in the rainforests of Brazil. Chapter 2 will explore the historical transition of cattle, from their ancient sacred role to the commodified meat product we consume today, as well as the factors behind skyrocketing meat consumption and the rise of global mechanized beef production.

Beef production both in the United States and in South America and politics are deeply interconnected. From federal subsidies and taxes that supported cattle barons on the Great Plains of the United States to the federal government of Brazil that promoted the development of the Amazonian Basin for commercial ventures, the role of politics in the meteoric rise of beef cannot be understated. Chapter 3 will explore key political moments in history that promoted the production of beef over the welfare of individuals to the present day.

The ranching of cattle for beef production has also had egregious effects on the environment. Beef production is a significant contributor to carbon dioxide levels in the atmosphere, causing it to be a major contributor to global warming and to environmental

degradation. In addition, it has also contributed to other ecological problems like desertification, loss of biodiversity, water and air pollution, and deforestation. Chapter 1 will explore available quantitative data that links environmental issues with beef production and consumption.

No exploration of the beef industry would be complete without a glimpse into the economics that spur the continued abuses of the industry. This paper will illuminate the massive profits and tax breaks received by beef producers in the United States, as well as in South America. The paper will also explore the economics of promoting a "feed" over "food" economy, and the detrimental effects of diverting edible grain from human populations. Chapter 4 will explore the economies of hunger and of livestock feed production that are fundamentally incompatible.

Finally, Chapter 5 will offer policy recommendations in an attempt to ameliorate the problems aggravated by global beef production and consumption.

Chapter 1: *Crunching Numbers.* Meat's Environmental & Humanitarian Disconnect

For a select portion of the world, food's ready availability creates a disconnect between its origin and its end product. Meat, in particular, has risen in the global markets, and is easily available in many developed and developing countries' markets. Though we know that the rising demand for beef and a growing population must require a great amount of agricultural inputs, few recognize the true scope of the endeavor.

Today, there are over a billion cows grazing on six continents. Nearly a quarter of the earth is used to graze and pasture cattle and other livestock.

The United States, Brazil, the European Union, and China are responsible for nearly 60% of the global beef market, with the United States topping the list at nearly 19%, which translates to nearly 10,861,000 metric tons.¹ A few questions remain: where is all of this beef raised, who provides the necessary inputs for an undertaking of this size, and what is it doing to our global community and to our earth?

Water. The process of raising livestock for meat consumption is both costly and wasteful. It takes 2,400 gallons of water to produce a single pound of beef. In comparison, a staple crop like wheat would take 25 gallons of water to grow a single pound. Already, the disparity between the two outputs is evident.

Agricultural pursuits account for nearly 70% of global freshwater use, making the agriculture industry the globe's largest consumer of freshwater. Nearly 8% of this global

¹ Cook, Rob. "World Beef Production: Ranking of Countries." *Beef2Live*. 2016.

agriculture freshwater usage is attributed to livestock production.² While water availability remains a huge issue, it is irresponsible to prioritize the growing global taste for meat over the necessity for clean, fresh water for drinking and bathing.

The use of rapidly decreasing global freshwater sources is not the only problematic element of raising meat. Agencies like the EPA have stated that industrial animal agriculture is the single largest contributor to water pollution.³

Our present situation in relation to water availability is dubious, at best. Globally, one sixth of the population does not have adequate access to freshwater for drinking and cooking. Nearly 2.5 billion do not have access to sanitation facilities that depend on water. These figures seem primed to worsen according to estimates by the FAO, which suggest that by the year 2025, 64% of the population may reside in areas that are "water stressed."⁴

Enormous quantities of livestock waste contribute to the decline in quality of freshwater reserves. In the United States alone, livestock produce over ten times the amount of waste than do their human counterparts. Unlike human waste, which is treated and cleaned, livestock waste is dumped in pits called lagoons as large as 20 acres and as deep as 15 feet. Two historians, Schlosser and Wilson noted that the waste from two cattle feedlots in Colorado accumulate more waste than the humans of the cities of Boston, Atlanta, St. Louis, and Denver... *combined*. The reality is that many of these lagoons seep into underground aquifers, contaminating precious groundwater. In the United States in particular, animal agriculture is responsible for an

² Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 63-93.

³ "United States Environmental Protection Agency." n.d.

⁴ Henning, Brian. 2011. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 70.

overwhelming amount of freshwater reserves pollution. For example, 37% of pesticide residue and a third of the nitrogen and phosphorus deposits found in reserves can be linked back to animal agriculture. Contamination of groundwater by runoff irreparably pollutes complex and fragile marine ecosystems, leading to 'dead' zones in coastal areas.⁵

Land. Land, too, presents an issue: raising livestock requires enormous tracts of space for pasture. Unfortunately, these tracts are predominantly in the Amazon rainforest of Brazil, or in the deciduous forests of the United States.

In a single year, 2.9 million acres of the rainforest were destroyed in Brazil to support factory farmed animals- 70 percent of what had previously been lush Amazon forests is currently pastureland or feed crops.⁶ The irony here is that the Amazonian rainforest land that is cut, cleared and cultivated is not well suited for cattle production. The soil of a tropical rainforest is not rich- a thick canopy and little sunlight prevent the soil from accumulating necessary nutrients. Sadly, after about three to five years of cattle grazing, the soil is largely depleted, necessitating the clearing of more Amazon rainforest.⁷

Since 1960, over a quarter of the forests in South America have been cut down to accommodate pastureland for cattle grazing.⁸ In Brazil now, the number of cattle actually exceeds the human population.

⁵ Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 70-71.

⁶ Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 72.

⁷ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. New York, NY: Plume, 1993. 195.

⁸ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 192.

In America, too, the use of land for cattle is problematic. The grazing of cows has led to severely diminished North American deciduous forests and stripped the land of its nutrients, throwing native flora and fauna populations into a state of flux.

Soil. In U.S. history, 260 million acres of forests have been felled to support animal agriculture. Harm to the land does not stop at deforestation. The FAO has reported that 20% of all pasture and rangelands are experiencing degradation in the form of soil erosion and overgrazing,⁹ and that that 29 percent of the earth's landmass now suffers "slight, moderate or severe desertification."¹⁰ The severity of this erosion cannot be understated, as a single inch of topsoil could take between 200 and 1,000 years to form.¹¹

This depletion makes continued agricultural pursuits difficult without lengthy efforts taken to rejuvenate soil health and biodiversity. Now, an area equaling 13 million square miles, (the area of the United States times four) is classified as "moderately" desertified, which means it is land that been stripped of nearly a quarter of its potential productivity.¹²

Annually, the United Nations Environmental Program reports that the global topsoil loss is about 25 billion tons, which represents a loss of potential soil and cropland productivity of over 29 percent. Each inch of lost topsoil can account for diminished grain yields of 6 percent. Worldwatch Institute notes that the UN's figure of 25 billion lost tons of topsoil each year has reduced grain harvest by 6 percent. This translates to a staggering 9 million tons of grain lost annually. In the United States, cattle and feed production accounts for 6 billion (of 7 billion) tons

⁹ Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 72.

¹⁰ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 200.

¹¹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 202.

¹² Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 200.

of eroded soil. This covers nearly 430 million acres in the continental USA, which suffers from a 25-50 percent reduction in productivity yield.¹³

This blatant environmental degradation is rarely (if ever) factored into the actual cost of beef. Instead, this environmental degradation is considered an "externality" that will only be paid for by future generations- literally and figuratively. Direct and indirect costs of soil erosion in the U.S. may total nearly \$44 billion annually.¹⁴

Biodiversity. This continual pillage of rich ecological resources has created a host of other problems relating to Earth's biodiversity.

According to the Government Accountability Office, livestock ventures are the number one threat to the vitality of plant species in the United States, and have already eliminated countless. In the United States, cattle grazing has affected rangelands to the degree that native bird populations are nearly decimated, as are wild animal populations such as bighorn sheep, pronghorn and antelope. The scarcity of natural vegetation in addition to the use of herbicides to control plant growth has hampered wild animal population numbers.¹⁵

Livestock production is an enormous contributor to deforestation, and also has a compromising role in the reduction of overall ecological biodiversity in the form of the sixth great extinction. Extinction rates are now 50-500 times the rate normalized by fossil records.¹⁶

¹³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 211.

¹⁴ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 203.

¹⁵ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 206-207.

¹⁶ Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 73.

The gravity of this situation is felt as species disappear from the earth every day. The spread of industrial livestock production is undoubtedly responsible for the acceleration of extinction.

In the Brazilian Amazon, this problem is exacerbated due to the incredibly sensitive ecosystem balance. Scientists estimate that more than half of all living species live in the Amazon- the biological diversity is incredibly rich. Small pockets of rainforest could contain as many or more plant species as the entire European continent: a four square mile section could be home to as many as 1,500 species of plants, 750 species of trees, 125 mammal species, 400 bird species, 100 reptile species, 60 amphibian species and 150 butterfly species.¹⁷ Many of these species are still undiscovered.

Additionally, human life depends on plants from the Amazon. Deforestation in this critical biome could lead to the end of life as we know it. Plants in the Amazon rainforest contain about 25 percent of our medications and pharmaceutical products, not to mention the natural rubbers, gums, dyes, waxes and oils that are used in a variety of industrial materials and consumer products. The National Cancer Institute has identified plants with anticancer properties and 70 percent of these are derived from the rainforest ecosystem.¹⁸ The increasing loss of forested land has, and will, lead to the decimation of nearly 15 percent of the plant species on Earth. The gravity of this loss of biodiversity cannot be understated.

Energy. The use of fossil fuels to power an increasingly automated agricultural sector contributes significantly to carbon dioxide emissions. The production of one calorie of beef

¹⁷ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 197.

¹⁸ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 197.

requires 40 calories of fossil fuel.¹⁹ The production of a pound of grain-fed beef in the United States is equivalent to the use of a gallon of gasoline.²⁰

The significance of the connection between livestock production and global climate change is this: emissions from agriculture on a global scale exceed both "power generation and transportation, contributing as much as a third of all greenhouse gas emissions." Although the livestock sector is responsible for a mere 9% of global carbon dioxide emissions, the production of livestock has enormous contributions to methane emissions that trap heat. Methane, though less present in the atmosphere than carbon dioxide, is responsible for 21% of anthropogenic warming, and has 23 times the heat-trapping capabilities of carbon dioxide.²¹

Cattle are responsible for the release of nearly 60 million tons of methane into the atmosphere- about 12 percent of global methane emissions. This release acts in conjunction with the release of methane by felling tropical forests, which can total anywhere from 50 to 100 million tons of methane.²²

The burning of biomass today is largely done to promote global cattle ranching operations. Nowhere is more susceptible to cutting and burning than the Amazon rainforest, which stores nearly 75 billion tons of carbon in its greenery. Cutting and clearing these forests releases massive amounts of carbon dioxide into the atmosphere. In fact, the biomass of the Earth's forests contains between 1.3 and 4 times the amount of carbon that is in the atmosphere. To put that into perspective, the peak year of Amazonian forest burning was 1987. The burning

¹⁹ Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 63–93.

²⁰ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 225.

²¹ Henning, Brian. 2011. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 73.

²² Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 226.

of biomass during this year accounted for nearly 9 percent of the global contribution to global warming from all sources.²³

The presence of these gases in the atmosphere is tangible, as the twentieth century has already experienced warming of .2 degrees Celsius, which has and will continue to affect climate patterns, extreme northern and southern climes, sea levels, extinction rates, and salinization of freshwater. These new and extreme weather patterns will undoubtedly create an onslaught of environmental refugees whose geographic locations necessitate immediate relocation.²⁴

Consumption of a meat heavy diet is a Western phenomenon, as well as a trend that is spreading rapidly as countries adopt a more Western model of consumption. A meat heavy diet is responsible for more carbon dioxide, nitrous oxide and methane than a diet that eliminates meat. In fact, a 2013 study found that those who eschew animal products have a greenhouse-gas footprint nearly 42 percent smaller than that of a meat-eater and nearly 14 percent smaller than that of a vegetarian.²⁵ Therefore, reducing meat's production and presence in diets would be an effective way to reduce the presence of greenhouse gases in the atmosphere.

Feeding the World. From a humanitarian approach, meat consumption makes even less sense. Over 60% of global agricultural land is utilized for the production of beef- while that beef production yields less than 2% of the world's calories.²⁶

²³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 225.

²⁴ Henning, Brian. "Standing in Livestock's "Long Shadow": The Ethics of Eating Meat on a Small Planet." 75.

²⁵ Soret, S., A. Mejia et al. "Climate Change Mitigation and Health Effects of Varied Dietary Patterns in Real-life Settings throughout North America." *American Journal of Clinical Nutrition* 100, no. Supplement_1 (2014).

²⁶"Meat and Animal Feed." n.d. *Global Agriculture at a Crossroads: Findings and Recommendations for Future Farming*.

One third of annual global grain harvest is converted to livestock feed. In the United States alone, the enormous amount of edible grain fed to livestock accounts for more than seven times the amount of grain consumed by Americans in totality.²⁷ The amount of grain ‘lost’ to livestock routinely reflects a number that is twice that of our current exports- and enough to provide every human with “more than a cup of cooked grain each day of the year.”²⁸ This is significant when we realize that there are nearly a billion malnourished global citizens.²⁹ The production of meat assists in the selective feeding of a small population of earth's people- the lost edible nutrition in the form of livestock feed is not only fiscally irresponsible, but morally reprehensible.

Chapter 2: *Meat's Maker.* The Growth of Farming, Feed & Meat

For much of our immediate history, the cow has represented little more than the starting point of a hamburger. It hasn't always been this way. For much of history, bovines have represented strength and virility, as well as fertility and life.³⁰

This relationship has been observed in the most ancient Egyptian civilizations, where the bull god Apis and the cow goddess Hathor were revered as otherworldly harbingers of power, strength, and new life. Pre-Christian Mediterranean cultures also attributed the bull god to the climate, weather patterns, and fertility. He, too, had a female cow goddess counterpart. They were responsible for the rule of all creation. Other regions, one that would later be known as

²⁷ Henning, Brian. “Standing in Livestock’s “Long Shadow””: The Ethics of Eating Meat on a Small Planet.” 63–93.

²⁸ Lappé, Frances Moore. 1979. *Diet for a Small Planet*. New York: Ballantine Books.

²⁹ Henning, Brian. “Standing in Livestock’s “Long Shadow””: The Ethics of Eating Meat on a Small Planet.” 69.

³⁰ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 9-10.

“Italia,” derived extreme pride from their association with cows- “Italia” quite literally means “the land of cattle.”³¹

This ancient relationship is one of function as well as reverence. Jeremy Rifkin notes in his book “Beyond Beef,” that “Western civilization has been built, in part, on the back of the bull and the cow.”³² Historically revered for their usefulness, cattle were domesticated first in Mesopotamia, although their use was primarily for sacrificial religious ceremonies. Later, they were yoked and used to cultivate fields to help peasants cultivate and yield crops.

The spread of the cattle culture took hold around 4400 B.C. when nomads from the Eurasian steppes, who had successfully domesticated horses, conquered Southern and Eastern Europe. They brought with them small herds of domesticated cattle who took to the Eurasian grasslands, marking “the beginning of a 6,000 year journey of pastoral conquest and domination” that has rocked history.³³ Their arrival signaled a cultural shift from what had previously been a peaceful and productive farming culture to one where the domestication and slaughter of livestock became an integral component of their daily lives.

The introduction of cattle changed farming and agricultural patterns, and also entire economic systems- indeed cattle may even be responsible for the dawn of modern capitalism. Rifkin notes that the word “cattle” comes from “the same etymological root as the word ‘capital.’” Cattle represented conveniently portable wealth, as well as objects that were excellent for trade. Slowly but surely, the sacredness of the cow was supplanted by the “secular notion of

³¹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 18-21.

³² Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 17-18.

³³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 26-27.

wealth generating economic productivity." Cattle would later be used as crucial elements of colonial expansion.³⁴

The growing global interest in cattle soon expanded to taste. In 15th century Europe, the population decimated by the Black Plague experienced a wage increase. Incidentally, as wages increased, so did meat consumption patterns.³⁵ This consumption period was largely temporary, as pressure on pastureland in the sixteenth century forced many to adopt a more vegetarian diet. Unsatisfied with this dietary switch, Europeans looked for other lands to produce their meat. This marked the beginning of the creation of a cattle complex that would span generations, continents, and eventually come to signify power and wealth.

North America. Christopher Columbus first introduced cattle to the Americas in 1494. Spanish conquerors, realizing that overgrazing herds had largely depleted their soil, transported cattle to the Americas in the 16th century. Spanish longhorn soon roamed and then dominated the islands of Puerto Rico, Jamaica, and Cuba. The Americas seemed to suit these animals, which grew, prospered and regenerated quickly. By 1598, a silver mine owner was permitted to settle the upper Rio Grande- now New Mexico- with over 7,000 cattle. Over the next century, mission priests migrated to Texas, bringing cattle with them. Rifkin asserts "the seeding of cattle in North America owes as much to the enterprising skills of Catholic priests as to the bravado of

³⁴ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 28-32.

³⁵ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 42.

military commanders and the wives of powerful Spanish ranchers.” All across the southwest, mission priests spread Catholicism and cattle.³⁶

Their influence, however, was not restricted to North America. Jesuit Priests and their cows followed Spanish armies into the South American regions of what would later be known as Argentina, Paraguay, and Brazil. Over the next hundred years, the cattle flourished and repopulated with alarming alacrity.

By the mid 19th century, South America had become so plentiful when it came to beef that it had become “the new grazing land of Europe.” Across South America, cattle barons rose to power from families who had colonized with their cows- their establishment of a “hierarchical herding culture” has lasting remnants of colonialism, subjugation, violence, and oligarchy.³⁷

The conquests of open grasslands did not stop with the Spanish army and Jesuit priests in the Southwest of North America or the grasslands of South America. British interest in the beef industry played an enormous role in the colonization of the American West.³⁸

Britain’s taste for meat proved larger than their ability to produce it. In Britain, the dining room table was highly indicative of socio-economic status. The amount of meat consumed reflected social standing. By the early 18th century, over 100,000 cattle were killed annually in London alone. This overwhelming desire for meat dictated many of Britain’s international and colonial policies, much to the misfortune of the farmers of Scotland and Ireland. These farmers

³⁶ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 45-48.

³⁷ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 49-51.

³⁸ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 52.

were forced to subsist off of potatoes as cattle grazing dominated- and eventually depleted- their heather-fields.³⁹

In search of readily available land to graze cattle, the British turned to North American grasslands. However, the well-established lean and gamey Spanish longhorn did not produce the type of meat that the British had grown to crave. Desiring fattier meat, British beef preferences created an entirely new agricultural and economic system whose influence is still felt on the diets and pockets of people today.

Instead of grazing the animals on grass, ranchers increasingly fed the cattle on diets of corn to rapidly increase their size and girth. They later transported them to Britain and Europe. In the 1830s, cattle in Texas numbered about 100,000. By the 1860s, that number had increased to 3.5 million.⁴⁰ This boom in production is a testament to the popularity of American raised beef. Assisted by the new transportation power of the railroad, the cattle industry expanded across states to Northern markets. Refrigeration technologies and British finances spurred a foreign market that would not cease to grow.⁴¹

This time period proved vital to the success of the beef industry. The marriage of animal husbandry and grain production created a product that was highly desired and consumed. This, in conjunction with the linkage of country and pasture by the railroad, proved perfect for a growing agricultural venture. By the 1880s, American beef was primarily eaten in England.⁴²

³⁹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 54-58.

⁴⁰ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 68-70.

⁴¹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 87.

⁴² Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 95.

In the post-Civil War era, speed proved vital to the beef production process. The packinghouses were the first American industry to establish the assembly line.⁴³ With this new technology, outputs and efficiency increased enormously.

The mechanism of meat processing continued into the years after the Second World War with the advent of “factory” feedlots in the 1950s and 60s. Newer companies were able to carve out a niche as they set up shop near meatpacking operations and cut transportation costs with cheap, often immigrant labor.

Increasing mechanization, industrialization, and urbanization pushed farming into unprecedented territory.⁴⁴ Small family owned farms increasingly lost business to corporate conglomerates that gained an enormous amount of control over the agricultural industry, creating a culture of commodification. The costs of radically transforming business through mechanization largely ruled small farms out of the competitive marketplace that comprised America’s agricultural interests.

The national trend of livestock production tilted toward vertically operating corporate conglomerates that owned the supply chain necessary for the business. Today in the United States, giants like Cargill, Smithfield, Tyson, and ConAgra dominate the livestock industry. Most of American meat- specifically beef- comes from animal feeding operations, called CAFOs (concentrated animal feeding operations), more commonly known as factory farms.⁴⁵

⁴³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 118-125.

⁴⁴ Kallen, Stuart A., ed. 2006. *Is Factory Farming Harming America?* At Issue. Detroit: Greenhaven Press.

⁴⁵ Wise, Timothy. “Identifying the Real Winners from U.S. Agricultural Policies.” *Global Development and Environment Institute*. 2005. 3.

The success of CAFOs and corporate conglomerates lies in the relationship between these corporations and the American government. The government has historically created subsidies for grain and feed that are commonly fed to livestock. These are primarily corn and soybeans, half of whose annual supply is funneled into CAFOs. Conglomerate meat organizations benefit enormously from these budget breaks (subsidies), as feed costs for cattle can account for nearly 17% of the total operational cost. Without these subsidies, operations costs could rise nearly 10% with full priced grain and feed.⁴⁶

To respond, farmers and conglomerates turned toward meat production to bolster their profit margins. Government subsidies of cattle feed, in particular, corn, made fattening livestock cheap, quick, and easy. As a consequence, more and more meat became available to American families, whose consumption of animal products skyrocketed. This agricultural model soon became the new normal, inspiring centralization of the farming industry. There was once an abundance of American meat producers. Now, four companies produce over 85% of American farmed beef.⁴⁷ Total U.S. meat consumption has increased from 9.8 billion pounds in 1909 to 52.2 billion pounds in 2012. This increase translates to about 200 pounds per person.⁴⁸ Globally, there has been a 41.3 kg per capita increase.⁴⁹

Brazil. Nowhere has this increase been felt more keenly than in the country of Brazil. Occupying nearly half of South America's landmass, Brazil is home to rich ecological diversity by way of the Amazon rainforest, which covers half of the country.

⁴⁶ Wise, Timothy. "Identifying the Real Winners from U.S. Agricultural Policies." 3.

⁴⁷ Wise, Timothy. "Identifying the Real Winners from U.S. Agricultural Policies."

⁴⁸ "Meat Consumption." *Mapbox*. 2016.

⁴⁹ "World Agriculture: Towards 2015/2030 - An FAO Perspective." 2016.

Brazil is home to ever expanding cities, industrial complexes and mines, which allow it entry into the global market. Perhaps the most exploited of Brazil's resources, however, is its land.⁵⁰

Farming is not new to the country- in fact; the indigenous people began tilling the earth nearly 12,000 years ago. Popular crops included peanuts, tobacco, sweet potatoes, corn, and cassava. In order to cultivate these crops, Brazilians would often burn sections of forest to till and use the ashes as fertilizer. It is important to note, however, that this process was carefully managed until the 1500s, when European settlers encouraged Brazilians to parcel their land into farms and practice monoculture.⁵¹

Cattle first arrived in Brazil in the mid 1500s, and a cattle industry developed both as a response to the burgeoning sugar industry and due to Portuguese colonization. This marked the beginning of the physical transformation of Brazil's landscape. The sugar industry required cattle as transportation and as food for workers.⁵² The Portuguese colonization spurred increased cattle ranching in the Amazon forests of Brazil after the cattle's initial introduction due to the need for milk protein.⁵³

As European influence in Brazil grew, so did the sugarcane, tobacco and cocoa trades, creating rich trading opportunities until the mid 1700s. The rise of the sugar trade promoted cattle ranching in the dry hinterlands of Brazil, which is known as the "sertão." Cattle ranching

⁵⁰ "Encyclopaedia Britannica." n.d.

⁵¹ Calmon, Pedro: *História do Brasil*, São Paulo, 1939, vol. 1

⁵² Hudson, Rex A., and Library of Congress, eds. *Brazil: A Country Study*. 161. 5th ed. Area Handbook Series 550-20. Washington, D.C: Federal Research Division, Library of Congress. 1998.

⁵³ Veiga, J.B, J.F. Tourrand, R. Pocard-Chapuis, and M.G. Piketty. "Cattle Ranching in the Amazon Rainforest." 2003.

became so widespread that it began to contribute independently to both the economy and to the development of Brazil's interior."⁵⁴

At the dawn of the 1800s, the coffee trade exploded in Brazil- over the course of a century, coffee exports grew from 19.6 tons to nearly 3,063,660 tons. This represented a new era in Brazil, one of a coffee oligarchy, that later tumbled at the peak of the Great Depression. The rise of coffee signaled the decline of sugar as a lucrative market. Accordingly, the cattle sector, which had initially come to fruition to accommodate the sugar economy's need for transportation, food, and hides, became a subsistence economy. As the production of cattle became more streamlined, large areas of the sertão became settled land. ⁵⁵

Brazil's complex history with industrialized cattle grazing began in the early to mid 1990s. Thirty years prior, the Brazilian government had allowed access to land they intended for agriculture by supporting the construction of highways and roads that crisscrossed the country, from coastal cities to the western regions.⁵⁶ These three major highways: the Belem-Brasilia, the Cuiaba-Santarem and the Trans-Amazon highway were integral to facilitating land access in Brazil.

⁵⁴ Hudson, Rex A., and Library of Congress, eds. *Brazil: A Country Study*.

⁵⁵ Hudson, Rex A., and Library of Congress, eds. *Brazil: A Country Study*. 162.

⁵⁶ Ongun, Melisa, Ben Chen, Peter Newton, and Helena Nery. "Examining the New Sustainable Beef Production Certification in Brazil." *Research Program on Climate Change, Agriculture and Food Security*. 2013.

Encouraged by this new availability of land, farmers would raise herds of cattle, which would rapidly deplete the area's natural flora and water systems. The farmers would quickly move further west, clearing parcels of rich forest as they went.⁵⁷

The two decades between 1970 and 1991 brought unprecedented growth for Brazil's cattle herds. They increased at nearly 3.1 percent annually, which translates numerically from 78.5 million to nearly 152 million cattle. Slaughter, too, necessarily increased, from 9.6 million to 13.9 million cattle.⁵⁸

Similarly to North America, The cattle industry in more developed areas of the country has been affected by transformative agricultural modernization. Around this time (1980s), Brazil also expanded its agribusiness sector and began supplying other countries with grains and meat.⁵⁹

In the mid 1990s and 2000s, Brazil's GDP for agriculture grew by nearly 12% a year. Brazil's beef exports exploded from 98,300 tons of chilled beef and 15,800 tons of processed beef in 1970 (\$298.6m USD) to 96,800 tons of chilled beef and 127,300 tons of processed beef in 1992- a value that is equivalent to nearly \$618.1 million USD.⁶⁰ While this growth has allowed Brazil to supply food to major international markets, it is important to note that nearly a

⁵⁷ Ongun, Melisa, Ben Chen, Peter Newton, and Helena Nery. 2013. "Examining the New Sustainable Beef Production Certification in Brazil." 2013.

⁵⁸ Hudson, Rex A., and Library of Congress, eds. *Brazil: A Country Study*. 191.

⁵⁹ Hudson, Rex A., and Library of Congress, eds. *Brazil: A Country Study*. 191.

⁶⁰ Hudson, Rex A., and Library of Congress, eds. *Brazil: A Country Study*. 191.

quarter of their outputs (oilseeds, meat, and grain) are diverted away from the country to supply world markets.⁶¹

Brazil's large population is also shifting consumption patterns to mirror those of the global North. Trends indicate that the country is gravitating toward eating more vegetables, fruit, oil, meat and milk. It is worthwhile to note that consumption of red meat, poultry, and milk is the fastest growing consumption category. From 1993 to 2009 average consumption of these products had increased from 31 kg per person to an average amount of 89 kg per person. This is expected to reach at least 92 kg per person in the year 2018.⁶²

Chapter 3: *We've Got Beef.* Politics As a Driver in Beef Production

The establishment of a cattle complex in both North and South America could never have been created so successfully without explicit government compliance.

United States. Early on, cattle enthusiasts noted that the Great Plains of the United States would be prime grazing locations for large cattle operations. There were a few barriers to entry, however. The grasslands of the Great Plains had to be cleared before they could be used almost exclusively for cattle grazing.

By the mid nineteenth century, Native American Indians and buffalo still lived plentifully on the lands of the Great Plains. Western grasslands were particularly adaptable to the extreme

⁶¹ Waldes, Constanza, Iñez Vidigal Lopes, and Mauro de Rezende Lopes. "Brazil's Changing Food Demand Challenges the Farm Sector." 2008.

⁶² Waldes, Constanza, Iñez Vidigal Lopes, and Mauro de Rezende Lopes. "Brazil's Changing Food Demand Challenges the Farm Sector."

climates of the Great Plains. In addition, the native grasses dried themselves, making the locale perfect for grazing cattle.⁶³ Yet large, migrating Indian communities still stood in the way of the rancher's paradise.

Rifkin noted "it soon became apparent that getting rid of the Indians could best be accomplished by eliminated buffalo from the western plains, cutting off their primary means of survival." To do this, buffalo hunters under contract with the United States army and railroad companies took their job of buffalo extermination to heart. Over the course of a few years in the 1870s, over 4 million buffalo had been slaughtered wantonly.⁶⁴

Carcasses were littered across the plains. Skins were sold commercially, as were hides and bones. In 1874, nearly seven million pounds of buffalo bones were shipped down the Santa Fe railroad line, making some Westerners rich at the expense of eliminating the "Indians' commissary."⁶⁵

With little viable food, Native American Indian communities either starved or surrendered to the United States government, accepting life on designated reservations that were patrolled by federal military. In a cruel twist of fate, the U.S. government turned the feeding of their new wards into a business opportunity. "The buffalo eaters of the plains became the new beef eaters of the western range." The government used the land stolen from the American Indians to raise cattle to supply food for the new reservations. Ironically, ranchers typically cheated Indians out of quality beef at absurd prices- a notoriously common practice of the "Beef

⁶³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 73.

⁶⁴ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 73-74.

⁶⁵ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 75-79.

Ring” in Washington.⁶⁶ To add insult to injury, the United States government permitted the exploitation of Indian reservation lands when displaced Native Americans were forced, out of starvation and fiscal necessity, to lease portions to ranchers at prices far below what they should have been, an amount that totaled around 270 million acres.

Cattle ranchers enjoyed both economic and political power. In the late nineteenth century, “cattle barons enjoyed near-hegemony over public lands.” “Range rights” were an established societal norm, and tiny militias closely guarded these enterprises with their geographic spheres of influence. As barbed wire fencing grew in utility and availability, cattle barons began fencing off enormous tracts of public land for private interests. Responding to pressure from disgruntled farmers, the United States Congress passed a law in 1885 to curtail and prosecute those who wanted to fence in public land for private use.⁶⁷ Unfortunately, the scope of the problem seemed insurmountable as government investigations proved that nearly 7 million acres of public land were illegally fenced by cattle barons in the late nineteenth century.⁶⁸

The power of the ranchers superseded that of the government. Rifkin noted, “where government legislation didn’t specifically favor the cattlemen, ranchers simply turned the laws to their advantage, by either legal or extralegal means.” 1934 brought the signing of the Taylor Grazing Act, which stated that ranchers could lease public land with the promise to maintain it. As expected, the vague specifications of the act led to continued rancher exploitation of tens of millions of acres of public land. In the mid 1990s, approximately 30,000 ranchers grazed their herds on nearly 300 million acres of public land, paying a mere fraction of the estimated market

⁶⁶ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 82-83.

⁶⁷ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 85-103.

⁶⁸ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 104.

value for pasturing cattle on the same lands. This astonishing subsidization of cattle ranching by the American people is largely ignored and rarely common knowledge.⁶⁹

With so much beef production in America, the United States government established a grading system that was supposed to measure the quality of beef. By the 20th century, British taste for rich and fatty meat took hold, and the US Department of Agriculture (USDA) took note. The quality grades for meat were based upon the “amount and distribution of finish [fat] on the animal.”⁷⁰ The grades are: prime, choice, select, and lower grades used for pet foods or processed meats. The USDA’s grading system specificity ensured that a grain-fed cattle complex was concretely established in the North American Midwest.

The rise of commercial feedlots in the mid 21st century was spurred by special federal tax incentives that encouraged individuals to invest in feedlots. This enabled the nearly 240 percent increase in agricultural yields between the years of 1945 and 1970, which was also made possible by corn surpluses. Subsidized by the government, corn quickly fattened cattle and allowed cattle barons to produce enormous amounts of beef at an extremely inexpensive rate to satisfy the demands of the American public’s palate.⁷¹

Around the time of the First World War, two thirds of American beef output was controlled by only five companies, aptly named the ‘Beef Trust.’ At the turn of the 20th century, the Supreme Court tried to sway the power of the pool. Three of the five companies fired back, creating a new corporation: the National Packing Company, which attempted to buy out

⁶⁹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 105-106.

⁷⁰ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 106.

⁷¹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 98-99.

competitors and other businesses in order to gain more influence. It became “the Greatest Trust in the World” because of its renowned power. The National Packing Company fell apart in 1913, but was quickly replaced by an international meat pool that began operating in Brazil and Argentina while exporting meat.⁷²

The rise of cattle cities, like Chicago in the late 19th century, led to difficulties between the Beef Trust and newly emerging beef-packing unions. As the beef-packers organized more efficiently, forming the Amalgamated Meat Cutters and Butcher Workmen of North America, their demands grew significantly. Demands for greater wages clashed with plant bosses whose jobs depended on cost efficiency. A series of union strikes left the plants unfazed as new immigrant workers and poor African Americans staffed them. The union struggled as it lost members, but regained strength during and after the 1930s.⁷³

The country’s largest beef processor: Iowa Beef Packers (IBP), alongside Cargill and Con-Agra, followed a trend of vertical integration in the 1970s. This essentially means that the beef industry was consolidated, creating a cattle complex of singularly owned cattle, grain, and beef processing and marketing ventures. These three powerful companies control nearly all of the steps in the beef production process. They also maintain control over some seed companies that produce the crops for cattle feeds, and the companies that produce fertilizers and pesticides.⁷⁴

⁷² Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 115-116.

⁷³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 122-124.

⁷⁴ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 130-131.

The federal government has made accommodating cattle one of its primary interests, as evidenced by its efforts to clear the grasslands of the Midwest of natural inhabitants that could pose potential threats to cattle. The initiative began in 1915 with \$125,000 allotted to control pests and predators on public land. That initiative has since evolved into the Division of Animal Damage Control in the USDA, which strives to eliminate threats to cattle at the expense of other species. This department has pursued extreme measures to rid the rangelands of their natural inhabitants. Measure included using cyanide guns against coyotes, gassing grasslands with Compound 1080 to destroy animals, and other various forms of traps.⁷⁵ In a single year (1989) the Animal Damage Control program (ADC) felled nearly 90,000 coyotes, 7,000 foxes, over 200 black bears, over 1,200 bobcats, and 80 grey wolves.⁷⁶ Their budget was nearly \$30 million dollars.

Brazil and South America. Though cattle ranching in Brazil began hundreds of years ago at the advent of Portuguese colonization in the 16th century, industrial animal agriculture gained a foothold in Brazilian life, economy, politics, and environmental concerns in the 20th century.

The late 19th century brought with it a rising demand for beef in Europe following the end of the Second World War. With American grasslands largely dominated by British investment houses, the fertile land of South America seemed like a goldmine for expanding the beef industry. Assisted by the World Bank and the Inter-American Development Bank, South American governments began to promote the conversion of millions of miles of rainforest to

⁷⁵ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 208-209.

⁷⁶ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 209.

crop and pastureland. In just six years in the 1970s, South American countries received over \$3.5 billion dollars to spur beef production.⁷⁷ Rainforests were razed to accommodate beef demands from the UK and Europe.

The 1940s were a period of extreme development in the Amazon Basin, by the order of President Getulio Vargas, who noted that:

"The Amazon, in the impact of our will and labor, will cease to be a simple chapter in the history of the world, and made equivalent to other great rivers, shall become a chapter in the history of human civilization. Everything which has up to now been done in Amazonas, whether in agriculture or extractive industry...must be transformed into rational exploitation."⁷⁸

This proclamation spurred the establishment of a number of government proposals to stimulate growth and prosperity. These programs included: the Superintendency for the Economic Valorization of Amazonia (1953), the Superintendency for the Development of Amazonia (1966), and the National Institute for Colonization and Agrarian Reform (1970).⁷⁹

Looking to increase activity in the Amazonian basin, the Brazilian government schemed and organized a tax-exemption program to support large beef production farms. The practice was exacerbated in 1964, when Brazilian law dictated that anyone who could display profitable land cultivation for a year could claim a right to the (previously public) land. This practice has

⁷⁷ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 147.

⁷⁸ Hall, A.L. n.d. "Developing Amazonia."

⁷⁹ João S. Campari, *The Economics of Deforestation in the Amazon*. 2005.

extended to modern day agricultural interests in Brazil, as recent studies indicate that public loans favor cattle ranching operations as opposed to ventures that support perennial food crops.⁸⁰

During the 1960s, widespread deforestation of the Amazon began. These efforts were supported by Brazil's national government. Its investment in policy decisions that would secure national territories, enable maximized economic benefit from rich natural resources, and allow farmers land on which to farm was a driving motivation.⁸¹ In order to work toward these goals, the 1960s brought public investment that supported projects like road construction.

The construction of three roads under the Trans-Amazon Highway movement proved essential in linking the Amazon rainforest to three Southern States, and an additional road was built to link the eastern and western parts of the country, as well as to provide access to the coastal regions. This allowed farmers to migrate and move quite freely about the country and made Amazonian land more accessible to agricultural ventures.⁸² Cattle ranching was seen as a viable method of raising national revenue in the 1960s, especially as the global market was carving out a place for beef. The rush of farmers into the Amazon enabled an exponential growth in Amazon land values, which coincided with government subsidies to farm the land.

The plan to develop the Amazon was (to its government creators) a relative success. From the 1960s-80s, 40,000 miles of Amazon rainforest were clear cut or burned for development- nearly 40% of which were for some kind of cattle developments. Today, Brazil's

⁸⁰ Veiga, J.B, J.F. Tourrand, R. Pocard-Chapuis, and M.G. Piketty.. "Cattle Ranching in the Amazon Rainforest." 2003.

⁸¹ Veiga, J.B, J.F. Tourrand, R. Pocard-Chapuis, and M.G. Piketty. "Cattle Ranching in the Amazon Rainforest."

⁸² Veiga, J.B, J.F. Tourrand, R. Pocard-Chapuis, and M.G. Piketty. "Cattle Ranching in the Amazon Rainforest."

potential wealth is jealously guarded by a ruling oligarchy, where a mere 4.5 percent owns 81 percent of the farmland. 70 percent of Brazil's population remains landless.⁸³

International Interests. In 1966, at the advent of Vargas's Operation Amazonia- an initiative by the Brazilian Government to convert large tracts of the Amazon to commercially viable land- large American, European, and Japanese firms began to take advantage of the Amazon in a modern day land grab.⁸⁴

The prospect of creating pastureland where Amazon rainforests once stood was appealing to corporations, and firms were given assistance from United States Agency for International Development, the World Bank, and the Inter-American Development Bank.

In the 1970s, the United Nations Food and Agricultural Organization encouraged developing nations to create a market with their surplus grains, provided that livestock could easily consume those grains. Large companies were also given government loans to promote grain-fed poultry projects in developing countries.⁸⁵

Brazilian Policy. Today, Brazil's use of rainforest for cattle ranching is increasingly coming under scrutiny by environmentalists. The Sustainable Agriculture Network's Rainforest Alliance certification program for sustainable beef production has set limits for Brazil's deforestation, use of water, and animal welfare. This program also implements a third party

⁸³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 194-195.

⁸⁴ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 194.

⁸⁵ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 162-163.

certification program for Brazilian beef that is more comprehensive and rigorous than any other Brazilian based program.⁸⁶

Currently, there is increased support for cattle ranching that increases productivity on already established pastures, called moderate intensification. This process involves techniques like rotational grazing and improving grass mixtures to both meet demand and curb the release of greenhouse gas emissions from deforestation.⁸⁷

In 2010, the board of the Consumer Goods Forum (CGF) pledged to achieve a goal of zero net deforestation by the year 2020. This marked the creation of the Tropical Forest Alliance 2020, which highlights deforestation and sustainable beef sourcing as the key components of its organization, which is comprised of industry members, governments, and civil groups.⁸⁸

Four years later, governments, industry members, and civil groups signed the New York Declaration on Forests, which aims to support restricting and eventually eliminating deforestation from beef production and other large agricultural pursuits. In addition, the pledge vowed to restore over 200 million hectares of forest by the year 2030, as well as implement incentives and rewards for those countries that take action to protect forests.⁸⁹

In the country of Brazil, there have been collaborations between high profile NGOs and the Federal Public Prosecutor's Offices (MPF) in favor of the protection of the Amazon. These have resulted in the MPF-TAC Agreement and the G4 Cattle Agreement. Consequentially, the

⁸⁶ Ongun, Melisa, Ben Chen, Peter Newton, and Helena Nery. "Examining the New Sustainable Beef Production Certification in Brazil." *Research Program on Climate Change, Agriculture and Food Security*. 2013.

⁸⁷ "A Path Towards Zero Deforestation Cattle." n.d. *National Wildlife Federation*.

⁸⁸ "A Path Towards Zero Deforestation Cattle." n.d. *National Wildlife Federation*.

⁸⁹ "A Path Towards Zero Deforestation Cattle." n.d. *National Wildlife Federation*.

MPF eventually sued large ranching enterprises that participated in the illegal clearing of Brazil's rainforest, as well as the slaughterhouses that butchered their meat. They also targeted retail corporations, effectively convincing them to boycott meat provided by companies that participated in illegal rainforest felling. As a consequence, meat production companies and slaughterhouses began participating in agreements that would delay any prosecution as long as they abstained from business with those who participate in illegal deforestation.⁹⁰

A similar agreement was reached in 2009, when Brazil's meatpacking monopoly signed an agreement with Greenpeace (the G4 agreement) to block the purchase of cattle from ranching operations that had participated in illegal deforestation activities.

The establishment of the Brazilian Forest Code in 1965 has set a precedent for legal governance of the rainforests of Brazil. In it, there are designations of Legal Reserves, which stipulate a percentage of the forest that must be retained in its integrity. Legal Reserves account for 80% of the property in the Amazon and designate deforestation here as illegal and prohibited. The Forest Code additionally targets "environmentally sensitive areas" as Areas of Permanent Preservation, where water resources and soil erosion are monitored and conserved. Of the newer implementations of the Forest Code is the creation of the Environmental Reserve Quota, which replicates the idea of tradable carbon credits, except for land areas with intact vegetation. A land area with an abundance of natural flora and fauna could be used as credit toward another area with a diminished biome that does not meet a minimum forest cover requirement.⁹¹ The registration of land in this CAR system is helpful for storing information on property boundaries

⁹⁰ "A Path Towards Zero Deforestation Cattle." n.d. *National Wildlife Federation*.

⁹¹ "A Path Towards Zero Deforestation Cattle." n.d. *National Wildlife Federation*.

and agricultural data. It may also help to increase transparency on ranching practices that may include illegal activity, but it alone cannot prevent deforestation- only aid in its detection.

Many of these initiatives by the Brazilian government were spurred by a 2008 agreement between Brazil and Norway which stipulated that \$1 billion USD would be given to Brazil over a 5 year period if they could lower greenhouse gas emissions from deforestation due to cattle farming to the 10 year average from 1996 to 2005. The funds were slated to go to the Amazon Fund, which is organized by the Brazilian National Development Bank and is used for initiatives that promote conservation and sustainable land use in the Amazon.⁹² It is evident that cattle's ranching in Brazil has proven to be an enormous problem in terms of Amazon depletion. However, recent policy changes are affecting the ways that Brazilians farm their cattle, which is a promising sign for the future of the Amazon.

U.S. Government Policy. Contrary to steps taken by the Brazilian government, U.S. federal policy toward industrial animal agriculture is anything but regulatory. The Congressional Research Service reports that many farming and ranching operations have continued exemption from environmental regulations put in place by the Environmental Protection Agency, which is astonishing given their scope, size and use of resources. Current federal farm policy in relation to the environment is more voluntary- economic incentives are utilized to encourage farmers to address environmental concerns.⁹³ These initiatives are supported by the US Department of Agriculture.

⁹² Birdsall, Nancy, William Savedoff, and Frances Seymour. "The Brazil-Norway Agreement with Performance-Based Payments for Forest Conservation: Successes, Challenges, and Lessons." Center For Global Development. August 4, 2014.

⁹³ Stubbs, Megan. *Environmental Regulation and Agriculture*. June 16, 2014.

Much regulatory responsibility for smaller agricultural actors is passed down to individual states, as federal environmental laws generally do not apply in these cases. An exception is CAFOs (concentrated animal feeding operations), which must receive federal permitting requirements.⁹⁴

The EPA takes into consideration a variety of effects on the environment by agricultural ventures, including on air, land and water. Agriculture's relation to greenhouse gas emissions has been clearly proven, yet the Congressional Research Service notes that the only agricultural sources that are subject to report the amount of GHG emissions to the EPA are manure management systems whose emissions of methane and nitrous oxide may exceed allowed levels. However, currently, the CRS notes that no agricultural sources have required compliance with this greenhouse gas-reporting rule.⁹⁵

Additional air pollutants, like ammonia and hydrogen sulfide, are emitted during animal production. Typically, these emissions would fall under a reporting requirement. However, the CRS states that as of 2008, the EPA crafted a final ruling on administrative reporting that "exempts hazardous substance releases that are emitted to the air from all livestock operations from CERCLA's requirement to report releases to the air to federal officials." This rule did not apply to CAFOs, and was challenged by industry groups in 2008 that stated that emissions from CAFOs were not threatening to the environment or public health in general. The EPA ruled

⁹⁴ Stubbs, Megan. *Environmental Regulation and Agriculture*.

⁹⁵ Stubbs, Megan. *Environmental Regulation and Agriculture*.

finally that it would not attempt to regulate air emissions from concentrated animal feeding operations, but that it would require their reportage.⁹⁶

Water protection and regulation remains an enormous issue in terms of the absence of regulatory governmental measures. The United States lacks a comprehensive and national study of animal agriculture's effects on water quality, though there have been several smaller studies that point toward the degrading effects of animal agriculture. Federal environmental regulations, such as the Clean Water Act (CWA) do not apply to or regulate agricultural players, which are largely policed by the states. Again, the exemption to this rule is large CAFOs, which are required a permit before they may discharge pollutants.⁹⁷

Again, problems exist concerning large-scale definitions- for example: in 1977, Congress altered the Clean Water Act and made farming, ranching and silviculture activities exempt from the stipulations of the act. Additionally, they exempted "agricultural storm water discharges" and water returned from irrigated agriculture. Therefore, agricultural agencies that utilize many of the standard technical practices need not apply for a CWA permit.⁹⁸

The compliance between the United States government and large animal agricultural industries is evident in the continued degradation of American lands by industrial animal ventures and in the lax policies and lack of real regulatory power over these industries. The difference between American government initiatives and Brazilian government initiatives is slightly surprising, though the increased regulatory action of Brazil may be attributed to the dire

⁹⁶ Stubbs, Megan. *Environmental Regulation and Agriculture*.

⁹⁷ Stubbs, Megan. *Environmental Regulation and Agriculture*.

⁹⁸ Stubbs, Megan. *Environmental Regulation and Agriculture*.

need to protect the forests of the Amazon. Additionally, the participation of other nations in the policies speaks to the global need for the resources of the Amazon. America, though rich in resources, is not home to a biome of such overarching environmental diversity. This disparity may explain differences in policy, both traditionally and moving forward.

Chapter 4: *Palate, Privilege & Poverty.* The Far-Reaching Consequences of the Burger

A discussion of the cattle complex that has ruled the large tracts of land of North America and the tropical rainforests of South America would not be complete without discussing its role in the local and global economy, and those implications for all.

Profit. The profit margins for the beef industry are enormous. In 1850, United States beef production was worth around \$12 million. Seventy years and \$4.2 billion dollars later, the beef industry was already one of the greatest contributors to America's gross national product (GNP) and acted as the second largest industry employer in the entire country.⁹⁹

As of 2014, the value of U.S. cattle and calf production was nearly \$61 billion dollars, and the United States' beef export value was \$6.5 billion, and represented about 11 percent of total production.¹⁰⁰

In 2015, the Brazilian Meat Exporting Industry Association (Abiec) estimated revenue from Brazilian beef sales to industrial markets would reach nearly \$8 billion.¹⁰¹

⁹⁹ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 113.

¹⁰⁰ "USDA ERS - Cattle & Beef: Statistics & Information." USDA ERS - Cattle & Beef: Statistics & Information.

These enormous figures show the economic power of the beef industries in both the United States and in Brazil, as well as the power these countries hold in terms of food in international markets. The enormous economic stakes of beef production have rippling effects on local, national and global economies, as described below.

Poverty. Poverty is an enormous problem: the World Bank has stated that globally, there are nearly 1 billion people living in absolute poverty. In terms of chronic hunger, the WHO reports that it affects over 1.3 billion people, and that nearly 20 percent are malnourished.¹⁰² There is a shocking disconnect here as we live in a culture where over a third of the grain produced globally is fed to livestock like cattle.

The global cattle complex is deeply affecting many areas of the world, but the Central and South American poor are disproportionately victimized in the mad dash to monopolize resources and achieve cost effectiveness. The furthering of a concentrated beef market is likely to deeply affect the economic and political standing of developing countries, and will likely be complicit in further marginalizing the poor. Political scientist Steven Sanderson notes:

“Therein lies the most significant political aspect of the internationalization of cattle production: the existential threat to the peasantry in countries with a large, poor rural population dependent upon agriculture for survival.”¹⁰³

These South American communities that rely do rely on agriculture must either flee or find a way to eke out a living on the edge of lush rainforests. They are forced to fell trees and

¹⁰¹ "Brazilian Beef." Brazilian Beef. January 20, 2015.

¹⁰² Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 177.

¹⁰³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 149.

subsistence farm at the forest's edge because they value "short-term survival over long-term sustainability."¹⁰⁴ Though they are directly responsible for the physical degradation of the forest, they- like the Amazon, are victims of a larger system that profits from the wellbeing of animals, not of humans.

In the global South- specifically South America- the use of agricultural land for the export of cattle feed grains is diverting agricultural energy away from feeding a burgeoning population. When faced with the choice between feeding people or feeding livestock, oligarchic power structures are more likely to feed livestock, sending their countries into food scarcity and their people into impoverishment. When food is grown, it is often upon strained earth, which greatly reduces the potential crop yield. In these situations, some governments have turned to importing foreign food, which is, unfortunately, generally provided by corporations that own and control every step of the beef processing industry. The pattern has become so predictable that the USDA noted in the early 1990s:

“Latin American countries will suffer deficits in feed and provide a burgeoning market for United States feed grains...largely due to increases in cattle production.”¹⁰⁵

Brazil, among other countries, is using an increasing amount of land in order to produce feed grain for cattle and other livestock. Interestingly, this feed is generally exported and goes to feed livestock elsewhere (US, Japan, Russia, Europe) because South American beef is largely

¹⁰⁴ Hollander, Jack M. *The Real Environmental Crisis : Why Poverty, Not Affluence, Is the Environment's Number One Enemy*. Berkeley, CA: University of California Press. 2003. 38.

¹⁰⁵ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 149.

grass-fed. For example: 23 percent of cultivated land in Brazil is designated for producing soybeans- over half of which go to export. The increasing production of soy has meant shrinking space for other crops intended for direct human consumption. Less grain is available for human consumption, which drives up grain prices, disproportionately and negatively affecting the poor. An example of this is the switch from growing black beans (a cultural and historical staple of Brazilian diets) to soybeans in order to court an expanding international market.¹⁰⁶

Employment. The physical decimation of the South American landscape (especially that of Brazil) has led to the displacement and abandonment of rural peasants who had previously worked the land. It has also wreaked havoc on the local economy in terms of jobs: raising cattle now is a labor efficient industry. A rainforest cattle ranch may have one employee per 2,000 head of cattle, which equates to about one employee per twelve square miles.¹⁰⁷ Consider this against the more traditional peasant agricultural model of subsistence where a square mile could support nearly one hundred people. When these peasants are robbed of this way of life, they often abandon their steads and migrate to urban areas, which are overcrowded and under abundant in terms of employment.

Food Scarcity and World Hunger. There is a common misconception that the growing population's dietary needs cannot be supported by our currently cultivated croplands. This, in fact, is incorrect- since the mid 1970s; cultivated cropland has been producing enough food to provide everyone on earth with an adequate diet.¹⁰⁸ An adequate diet, as described by the Food

¹⁰⁶ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 148.

¹⁰⁷ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 150.

¹⁰⁸ Hollander, Jack M. *The Real Environmental Crisis : Why Poverty, Not Affluence, Is the Environment's Number One Enemy*. 40.

and Agriculture Organization of the UN amounts to about 2,300 calories per person with equal access to food. Taking into account the variety of diets and the potential nutritional deficiencies of some areas, the FAO rounds the figure to 3,000 calories per person daily. The global food requirement is calculated by multiplying the global population by the amount of calories necessary to maintain an adequate daily intake. Consider 9 billion individuals at 3,000 daily calories each- this is a figure around ten million billion calories. Though the number seems impossibly large, currently cultivated cropland totals around 1.4 billion hectares. In the United States, crops like wheat and corn have an average annual yield of 3 tons and 6 tons, respectively. Following this model, the world (9 billion individuals) could each be fed 3,000 daily calories on less than two-thirds of today's cultivated cropland.¹⁰⁹

It is worthwhile to note that the global North receives around 30 percent of their nutritional intake from animal products like dairy, poultry, and red meat.¹¹⁰ If global consumption patterns tilt toward Western tastes, global food demand would increase dramatically. This would prove problematic, as tracts of cropland needed to produce grains for humans would increasingly be dedicated to growing feed for livestock, which provides a much smaller caloric return. In terms of protein, the scale is undoubtedly tipped in the favor of growing more grains for human consumption. Food economist Frances Moore Lappé notes that:

"An acre of cereal can produce five times more protein than an acre devoted to meat production; legumes (beans, peas, lentils) can produce ten times more; and leafy vegetables,

¹⁰⁹ Hollander, Jack M. *The Real Environmental Crisis : Why Poverty, Not Affluence, Is the Environment's Number One Enemy*. 41.

¹¹⁰ Hollander, Jack M. *The Real Environmental Crisis : Why Poverty, Not Affluence, Is the Environment's Number One Enemy*. 42.

fifteen times more...spinach can produce up to twenty-six times more protein per acre than can beef."¹¹¹

She explains that 145 million tons of grain and other feed were fed to livestock in 1979, but only 21 million tons of that original feed was available for human consumption in the end in the form of meat, eggs, and poultry. There had been a waste of nearly 124 million tons of feed. Not only is this significant in terms of the human feeding potential, as the difference could feed "every single human being on earth with more than a cup of cooked grain each day of the year"¹¹² but economically as well. It is the monetary equivalent of nearly \$20 billion.¹¹³

Trade. The global trade of grains to support cattle populations is increasingly problematic in relation to equity. There is often a perception of the West as bountiful and beneficent, exporting grain to assist the hungry in developing countries, and importing only necessities. This is far from the case. The West imports an enormous amount of oilseeds (peanuts, palm kernels, etc.), fishmeal, and oilseed products from developing countries with relatively high levels of poverty and hunger.¹¹⁴

Swedish hunger authority Georg Borgstrom noted that the West typically imports more protein from developing countries than it *exports* to countries with high levels of poverty and food insecurity. The exchange figures out to about 3 million tons of cereal protein (grown

¹¹¹ Lappé, Frances Moore. 1979. *Diet for a Small Planet*. 10.

¹¹² Lappé, Frances Moore. *Diet for a Small Planet*. 14.

¹¹³ Rifkin, Jeremy. *Beyond Beef: The Rise and Fall of the Cattle Culture*. 161.

¹¹⁴ Lappé, Frances Moore. *Diet for a Small Planet*. 23.

regionally) traded for 4 million tons of nutritionally superior protein (grown abroad), which largely go to fatten our livestock, as opposed to feeding those suffering from malnourishment.¹¹⁵

In an even crueler twist of fate, residents of these developing countries often replace culturally significant crops (traditionally consumed by humans) in favor of cash crops (typically not consumed by humans) that will allow them to trade. This lessens the amount of locally grown food in the area, and forces the country or region to import food, generally at a high cost. As expected, this pricey imported food is available only to a wealthier subset of the population, leaving the poor even poorer and without a way out of the system.¹¹⁶

Chapter 5: *Moo-ving Forward*. Practical Food Policy

It is important to note that a reduction in meat will help alleviate many problems regarding our current agricultural system and its effects on environment and economy. However, an examination of overall consumption levels is an absolute necessity, as they reflect a shocking lack of equity in resources between the global North and South. Present day consumption levels are unsustainable, and represent the direness of our present situation.

The ranching of cattle and the production of beef has led to a host of political, environmental, economic, and humanitarian issues. But what is to be done for a world that is increasingly obsessed with filling their plates with the meat they believe will bring them strength and status?

¹¹⁵ Lappé, Frances Moore. *Diet for a Small Planet*. 23.

¹¹⁶ Lappé, Frances Moore. *Diet for a Small Planet*. 27.

Consumer Education. Curtailing the consumption of meat may be as simple as convincing people all over the globe to eat less of it for an abundance of good reasons. More and more information is becoming available about the health risks of consuming cured and fatty meat. In October 2015, the World Health Organization published findings that suggested processed red meat contributed to consumers' risk of certain types of cancer.¹¹⁷ In addition, data concerning the devastating environmental consequences of industrial beef production is known and widely shared. The increasing availability of this information is a necessity in terms of educating the public about the true cost of their dietary decisions.

Admittedly, information about government and agribusiness collaboration may not be on the forefront of the general consciousness. Therefore, implementing educational initiatives is a necessity. Schools are the perfect place to implement education-based initiatives that inform students about the role of the government in their food production systems and about the specifics of where their food comes from. School cafeterias are also some of the first places that children are exposed to cheaply produced beef. Providing information for students, caregivers, educators, and school boards about the nutritional adequacy of a more plant-centered diet could help transform school lunchrooms across America and across the world, creating a new, more sustainable model of eating for coming generations.

Subsequently, Frances Moore Lappé notes that government backed educational campaigns about the importance and completeness of a plant centric diet would be an effective persuasive method in addition to steps taken by local and regional educators. She also cites the importance of advertising campaigns whose influence is felt keenly by much of America. She

¹¹⁷ "Q&A on the Carcinogenicity of the Consumption of Red Meat and Processed Meat." World Health Organization. October 2015.

notes that economic incentives for those who spread positive messages concerning the need to revolutionize modern day diets could be an effective method as these messages are often plastered across our magazines, newspapers, and television screens.

While public opinion can be difficult to sway, especially in a world where consumption levels have the power to convey success and wealth, the presence of government commitment and assistance is absolutely necessary.

Government. Frances Moore Lappé suggests that the government increasingly subsidize less *feed* grains and more *food* grains. The USDA, she notes, has long been "actively involved in deciding *how much* and *what* is to be grown on American farmland."¹¹⁸

Therefore, subsidies for growing grain and bean products that are readily consumable by humans should take priority over the current system that places undue value on growing large amounts of feed grains that go to support livestock. Here, we could begin the reversal of our present "feed economy" back into a "food economy"- one that would support the nutrition and food security of those previously denied.

Governments also must begin to disassociate themselves from cozy relationships with large beef retailers and impose necessary taxes on products, like meat, that are environmentally degrading. In recent months, The Danish Council of Ethics recommended a tax on beef that would reflect its negative impact on the environment and on climate change. Denmark's government will now consider placing a tax on meat and other foods that have been associated with environmental damage. The Council noted that the country could no longer rely on its

¹¹⁸ Lappé, Frances Moore. *Diet for a Small Planet*. 45.

citizens as “ethical consumers” to rectify agriculture’s role in climate change, and to alleviate Denmark’s contribution to global warming.¹¹⁹ This realization by a governing body and a commitment to the health of the environment over the wealth of agribusinesses is precisely the type of action that must be replicated in nations around the world. Global leaders, like the United States, have complicity with multinational beef production ventures and are unwilling to regulate them. This attitude is harming both the environment and the health of the public, and these countries must be willing to take a stand.

Farming. Creating a cultural and paradigm shift in relation to diet is a venture that will take a substantial amount of time, though I believe it is worthwhile. In the meantime, other initiatives that could help alleviate the strain of the grain fed cattle complex involve looking for methods of more sustainably feeding livestock from materials that humans cannot readily consume, therefore eliminating the competition that now exists between feed grain producers and food grain producers.

Increasing the viability and productivity levels of land is also an option. Occasionally called “intensification,” this process involves boosting production by increasing the number of cattle per acre of pasture, utilizing rotational grazing, improving pasture grass mixtures, and using breeds more inclined for life in tropical habitats. In addition to increasing the productivity of existing farmlands, the expansion of farming into previously cleared, but abandoned land, might be a counter for deforestation. Though Brazil’s current policies concerning the production of cattle are not enough to fully curtail the deforestation of the Amazon, their efforts to stop and

¹¹⁹ Withnall, Adam. “Denmark Ethics Council Calls for Tax on Red Meat to Fight ‘ethical Problem’ of Climate Change.” *The Independent*. April 27, 2016.

boycott cattle ranchers who illegally clear forests, as well as their increasing commitment to aforementioned ranching techniques, represents forward momentum in the effort to minimize- or even halt-the damage by cattle ranching.

Economics. Multi-national agreements, such as the previously mentioned partnership between Brazil and Norway seem to have some promise for the future of agriculture in relation to environmental sustainability. The economic incentive of \$1 billion USD has spurred action by Brazil's government and by international and local NGOs to protect the Amazon against cattle ranching. Again, the push towards producing beef with methods that are less environmentally degrading is heartening, but inevitably, production levels of beef must decrease in order to secure the environmental integrity of agriculture.

The economy can also be used to leverage meat consumption. By pricing meat at its “full cost” by factoring in the massive amounts of resources beef production requires, in addition to reducing subsidies of animal feed, the cost of meat would rise greatly, making it a less appealing option for a large population.

Conclusion. Combating the production of beef and other meat will not be easy. It will require a combination of educational initiatives as well as comprehensive global policies that heavily regulate and revise beef and meat production ventures.

In relation to these industries, the environment- not the economy- must be prioritized. In addition, governments must act in favor of their communities and help subsidize grain for human consumption to alleviate food insecurity, as well as push for full-cost pricing of beef and meat products that reflects the use of energy and other resources.

Comprehensive educational initiatives should also be enacted to inform children and adults about the environmental, health and humanitarian effects of beef and meat consumption.

These are all important steps toward a more sustainable way of eating, but communities across the world must begin to realize that their daily food choices truly have the power to change the physical and societal nature of the globe.

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