A CENTURY OF OVERPRODUCTION IN AMERICAN AGRICULTURE

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American agriculture in the twentieth century underwent immense transformations. The triumphs in agriculture are emblematic of post-war American progress and expansion but do not accurately depict the evolution of American agriculture throughout an entire century of agricultural depression and economic failure. Some characteristics of this evolution are unprecedented efficiency in terms of output per capita, rapid industrialization and mechanization, the gradual slip of agriculture's portion of GNP, and an exodus of millions of farmers from agriculture leading to fewer and larger farms. The purpose of this thesis is to provide an environmental history and political ecology of overproduction, which has lead to constant surpluses, federal price and subsidy intervention, and environmental concerns about sustainability and food safety. This project explores the political economy of output maximization during these years, roughly from WWI through the present, studying various environmental, economic, and social effects of overproduction and output maximization. The complex eco system of modern agriculture is heavily impacted by the political and economic systems in which it is intrinsically embedded, obfuscating hopes of food and agricultural reforms on many different levels. Overproduction and surplus are central to modern agriculture and to the food that has fueled American bodies for decades. Studying overproduction, or operating at rapidly expanding levels of output maximization, will provide a unique lens through which to look at the profound impact that the previous century of technological advance and farm legislation has had on agriculture in America.

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CHAPTER 1

INTRODUCTION

American agriculture in the twentieth century underwent immense transformations. The triumphs in agriculture are emblematic of post-war American progress and expansion but do not accurately depict the evolution of American agriculture throughout an entire century of agricultural depression and economic failure. The successes, innovations, and efficiencies of the previous century in agriculture have been well documented by historians in works such as Paul K. Conkin's *A Revolution Down on the Farm: The Transformation of American Agriculture since 1929*[1] and Bruce L. Gardner's *American Agriculture In The Twentieth Century: How It Flourished and What It Cost*.[2] This thesis is a political ecology of overproduction in American agriculture, focusing on the impact that an ever-growing ethos of abundance and maximization has had on American farms.

The social and economic transformations of rural America, while important to this story of modern American agriculture, are not this project's focus. Many other works, such as David B. Danbom's *Born in the Country: A History of Rural America,*[3] and Arne Hallam's *Size, Structure, and the Changing Face of American Agriculture*[4] have provided great historical and economic accounts of the vast effects of modernity on rural and agricultural life. Some characteristics of these changes are unprecedented efficiency in terms of output per capita, rapid industrialization and mechanization, the gradual slip of agriculture's portion of GNP, and an exodus of millions of

[1] Conkin, Paul K. *A Revolution Down on the Farm: The Transformation of American Agriculture Since 1929 (*Lexington: The University Press of Kentucky, 2009).

[2] Gardner, Bruce L. *American Agriculture in the Twentieth Century: How It Flourished and What it Cost.* (Cambridge: Harvard University Press, 2006).

[3] David B. Danbom, *Born in the Country: A History of Rural America* (Baltimore: The Johns Hopkins University Press, 2006).

[4] Arne Hallam, *Size, Structure, and the Changing Face of American Agriculture* (Boulder, CO: Westview Press, 1993).

farmers from agriculture leading to fewer and larger farms.[5] These topics are in many ways linked to total war economic expansion, and all provide fascinating examples of the dramatic changes in modern agriculture but are not discussed or analyzed here at length. My purpose is to provide an environmental history and political ecology of overproduction, which has lead to constant surpluses, federal price and subsidy intervention, and environmental concerns about sustainability and food safety. Studying overproduction, or operating at rapidly expanding levels of output maximization, provides a unique lens through which to look at the profound impact that the previous century of technological advance and farm legislation has had on agriculture in America.

Overproduction and surplus are central to modern agriculture and to the food that has fueled American bodies for decades. This project explores the political economy of output maximization during these years, roughly from WWI through the present, studying various environmental, economic, and social effects of overproduction or output maximization. Another term for this sort of approach is political ecology, which studies the relationship between various eco systems and political systems.[6] Political ecology is often intertwined throughout environmental history, studying the ways political decisions positively or negatively impact ecologies. The complex eco system of modern agriculture is heavily impacted by the political and economic systems in which it is intrinsically embedded. My focus here is to study the long term implications of systemic overproduction in American agriculture, and this paper argues that subsidized overproduction, a major characteristic of modern agriculture, is the result of brief periods of economic booms in World War I and World War II. Overproduction and output maximization that resulted from increases in demand during the World Wars led to brief periods

[5] Hallam, *Size, Structure, and the Changing Face of American Agriculture,* 2.
[6] Paul Robbins, *Political Ecology: A Critical Introduction* (Hoboken, NJ: Blackwell Publishing, 2004).

of price stability and prosperity for twentieth century American farmers. The federal government supported prices to incentivize increases, and European agriculture was greatly disrupted by war on their doorstep in both periods of total war. These brief periods of lofty expectations, along with government pressure to maximize output for war, led to great increases in agricultural output. This yielded added income for farmers who continued to produce at these higher levels after the treaties were signed and the wars were done. Farmers believed this was a new day and continued to maximize output in the post war years, detrimentally causing farm prices and their livelihoods to plummet.

Consider the following quotation from Clinton P. Anderson, President Truman's Secretary of Agriculture, which demonstrates in clear and direct language the way that an environment of agricultural overproduction became firmly embedded in American power systems. Secretary Anderson's words have come to embody modern food production, and this excerpt from the *USDA Yearbook of Agriculture, 1943-1947* provides the theoretical questioning and framework for this project. He wrote:

> Does not the same DDT that kills the Japanese beetle also kill the honeybee? By breeding a new wheat that withstands rust are we not making it more susceptible to a different enemy? Can we never be satisfied- must we go on with research forever? Does not this technology lead sooner or later to overproduction? On such points I have no fear: We did not stop making automobiles for fear we would wreck them; or leave off erecting dams, lest they burst; or refuse to construct homes because they might cave in. And need we be concerned that life be too abundant, that we and others in the world will have too much good food, too many clothes, too many medicines for our ills, too much leisure to look upward?[7]

In order to understand the modern food system, we must understand the ethos of abundance portrayed in the Secretary's quotation, words that epitomize the past century of American agricultural overproduction. A great majority of the current food and agricultural market is built

[7] Clinton P. Anderson, "Life More Abundant", *USDA Yearbook of Agriculture, 1943-1947* (Washington D.C.: U.S. Government Printing Office, 1947) V-VI.

on overproduction. Inexpensive crops that are produced at prices lower than farmers' costs of production have flooded the market place. Farm consolidation and agribusiness have utilized their economies of scale to turn profits, along with using cheap crops such as corn and soy beans to chemically manipulate into value added processed and convenience foods. Surpluses of cheap grain have led to an adoption of corn and soy based feed for cattle and chickens, animals that evolved to eat and digest grass. Corn is grown for ethanol fuel, another alternative use for an overproduced, yet still heavily subsidized crop. American overproduction and surplus are as emblematic of the modern food system as the food (or food-like output) itself.

There are numerous research questions that brought me to this topic. The overarching purpose is to better understand the history of modern Americans' relationship with food, food systems, and the "natural" or non-human world. I believe that food and agriculture give us a visceral and practical way of relating to or situating ourselves within our own modern ecology. Why has modern industrial food moved people further from that relationship? Consumers and producers have been systematically separated by modernity in agriculture and food, thus muddying the real costs of food. How has legislation attempted to resolve these intrinsic issues in agriculture? Two major pieces of post war legislation, the Agricultural Adjustment Administration following World War I and the Soil Bank Program following World War II, display governmental attempts to slow overproduction in price depressed years that followed these major booms in demand. The failures of these programs led to an implicit federal support of overproduction, surplus, agribusiness, and farm consolidation. This is best illustrated by President Nixon's Secretary of Agriculture Earl Butz's famous demand of American farmers to "get big or get out" of American agriculture. Who benefits most from subsidy payments? Do corporations and industrial growers gain the lion's share of federal aid through subsidies?

Additionally, if the largest farms received the majority of subsidy dollars, did these programs such as the Agricultural Adjustment Administration exacerbate the financial situation for small to medium sized farms by paying the most aid to the farms that needed the money least? Why has the government failed to institute systems that offer alternatives to crop subsidies? How can subsidies still be viewed as a viable option after nearly a century of enduring policies of subsidized overproduction? Do lobbyists and corporately-affiliated people in elected or appointed positions of authority have enough power to uphold agricultural policies that do not make economic sense? And finally, what tangible impact has the "produce more, earn more" ethic had on farm labor markets? Agriculture has undergone a seismic restructuring process over the last century, and has resulted in an economic stratification that is extraordinary wealthy at the top and overwhelmingly poor at the bottom. Fueled by relatively inexpensive labor, larger farms are turning out sizable profits due to subsidized crop specialization, and immense output. Corporate agribusiness remains very profitable in an economically failing agricultural market due to social and environmental exploitation. Which leads a final question: how has the food consumed by human bodies changed as a result of total war and continued overproduction? Practically speaking, this is the common thread that associates all of us with modern agriculture. Humans, their food, and the environments that create their food, are all intertwined in economic, philosophical, social, and political relationships. To understand an environmental history of the agricultural system that grew out of total war in the twentieth century is to navigate and explore the changes in this complex relationship.

These questions initially interested me in these problems in modern agriculture, and led me to use the framework of environmental history as the primary angle of analysis for this project. Environmental history is not a moral compass or political ideology retroactively applied

to history, but a way of approaching the study of history that situates social, political, cultural, and economic changes within the nonhuman world. It does not have rigid boundaries, and offers a multidisciplinary approach to historical topics. Environmental history is of great assistance to agricultural topics, because American agricultural history is an intricate evolution of social, economic, political, and cultural developments. In addition, environmental history seeks to situate human history in nature, as opposed to viewing nature as a blank canvas that history happens on. This approach attempts to discover the role that the non-human world has played in human history, and does not accept views and portrayals of nature only as recipient of human agency. Specifically in agriculture, studying the agency of "nature" can be very revealing in attempting to understand the history of farming, legislation, social developments, and technological innovation. Food and farming transcend agricultural history because their production is consumed by entire populations of people. Environmental history tends to explore topics that do have environmental implications, and this project will have explicit and implicit environmental concerns. Modern agriculture is environmentally unsustainable, and while environmental concerns will not be the focus of this project, to ignore the long term environmental implications of modern food production would take away from the purpose of exploring this story.

Following in the footsteps of the majority of recent environmental and food histories, such as Shane Hamilton's *Trucking Country: The Road to America's Wal-Mart Economy*,[8] Harvey Levenstein's *Fear of Food: A History of Why We Worry About What We Eat*[9] and Edmund Russell's *War and Nature: Fighting Humans and Insects with Chemicals from World*

[8] Shane Hamilton, *Trucking Country: The Road to America's Wal-Mart Economy* (Princeton: Princeton University Press, 2008).

[9] Harvey A. Levenstein, *Fear of Food: A History of Why We Worry About What We Eat* (Chicago: The University of Chicago Press, 2012).

War I to Silent Spring,[10] a wide and diverse collection of primary and secondary sources have been consulted during my research. A number of political history sources have been included, along with statistical and census data. I have also incorporated farmers' letters, agricultural magazines, philosophical pieces, advertisements, government documents, surveys, committee reports, press releases, and propaganda posters. Primary sources are central to my analysis and arguments on overproduction's place as the defining characteristic of the last century of agriculture in America. A selection of secondary sources provide context for agricultural, economic, political, and social developments during this general time period of total war and post war years.

The second chapter of this project provides a lengthy examination of WWI and WWII booms in agriculture, following depressions in agriculture, and the legislative attempts aimed at mending the agricultural economy. This chapter is an in depth introduction to the two major federal programs that followed each period of total war economic mobilization. This provides context and allow for a broader approach to understanding the problems in agriculture associated with total war markets. These two programs are the Agricultural Adjustment Administration and the Soil Bank Program, and these programs attempted to solve crises in agriculture following World War I and World War II respectively. The third chapter studies the overproduction of corn, as food and feed, source of fuel, and basis for the explosion of processed foods. This chapter looks at the growth of the corn industry specifically following WWII. As corn transformed from a native tall grass to a scientific and industrial super food, corn overproduction became systemic, fueling a modernizing food system. Finally, this chapter explores how technologies and chemicals affiliated with total war research and development enabled constant

[10] Edmund Russell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge: Cambridge University Press, 2001).

overproduction and ever increasing yields- so much so, that new uses for corn had to be developed in order to deal with the subsidized surpluses. The final chapter studies overproduction in the beef industry. This case study of the beef industry is closely related to corn- and equally emblematic of the persistence of overproduction throughout the last century in American agriculture. This study is imbedded with environmental implications and sustainability concerns associated with modern meat consumption. These chapters follow a chronological order and pay heavy attention to the years from WWI through the early 1970s. The environmental, economic, and social implications of the actions and policies in this period stretch well into the present and have created a modern food system that is the recipient of much fiery criticism and condemnation.

The pages that follow explore a century of agricultural history that is profoundly significant to current events. I hope that this work fits alongside recent environmental and food histories in seeking to understand our complex ecologies and searching for more sustainable and egalitarian relationships within those ecologies. A historical narrative of the systemic and chronic overproduction that defines the modern food supply is vital to understanding the challenges of changing a agricultural system that has deeply embedded itself within the political and economic systems. American farm lands continue to be exploited, powered by noxious chemicals and fueled by limited and costly supplies of fossil fuels. American agriculture produces more commodity crops and meat than American mouths can consume. While fiscal costs at the supermarket remain comparatively low, operating at unsustainable levels of output has economic, social, and environmental costs that are yet to be fully realized.

CHAPTER 2

THE AGRICULTURAL ADJUSTMENT ADMINISTRATION, THE SOIL BANK, AND THE LEGISLATIVE FAILURES IN OVERPRODUCTION MANAGEMENT

Total war in the twentieth century had a radical impact on American agriculture and proved to be a major catalyst that forced massive social, economic, and political transformations for farmers. The implementation of institutional policies of overproduction during World War I and World War II exposed American agriculture to new levels of economic prosperity. American farmers adapted quickly to this new environment of increased demand, prices, and output, and fulfilled their patriotic duty in aiding the allied war efforts in the First and Second World Wars. The incalculable economic pressure of total war production during World War I and World War II, specifically in agriculture, illuminated an institutional flaw in American capitalist markets, however, and resulted in post-war tribulation for farmers in a wealthy and prosperous nation. The dire situation in agriculture during these two post war periods forced legislative attempts to remedy the failing free market system. This chapter focuses on the two most prominent pieces of post war farm legislation, the Agricultural Adjustment Act of 1933 and the Agricultural Act of 1956, and evaluate their performance. These two federal attempts at solving farming's woes turned into long term bandages, subsidizing and supporting the economic ethics of abundance and exploitation that caused these very downturns. This ethos of abundance and maximization, a theme that radiates throughout this period of agricultural expansion, became intrinsically interwoven into policies and laws regarding agriculture. Wartime demand set new expectations in agriculture. These periods were not treated as isolated snapshots of abnormal demand, rather as new levels of output to maintain in the years that followed WWI and WWII, periods of mass production and patriotic consumerism.

This chapter focuses on the history of the entrenchment of policies of abundance and maximization during this period, and the political economy of twentieth century American farming. These two major pieces of legislation serve as bench marks in understanding this economic and agricultural history of the modern food system. The failure of the federal government's two major policies in dealing with the root cause of crippling overproduction in the post WWI and WWII periods led to an expansion of the government's role in food production, further consolidated and strengthened corporate dominance in agriculture, and fostered government dependence in modern farming.

World War I, Postwar Depression, and the Agricultural Adjustment Administration

World War I created short term prosperity for American farmers, who were able to meet the needs of European countries looking to import grain and cotton. These countries were using every ounce of their economic might to maximize war production and keep pace with German arms capabilities. The federal government began pushing farmers to increase production for European economic aid. Military historian Walter Mills, in his work titled *Road to War: America 1914-1917* discusses the birth of major foreign demand due to war. Mills wrote, "Allied governments came heavily into our markets for food, raw materials, and commodities of all sorts."[11] This incredible demand boom for American agriculture, along with federal pressure to meet these export needs, resulted in increases in rural standards of living and huge increases in the prices farmers received for crops. Wheat production, for example, increased from over 760 million bushels in 1913 to over 1.25 billion bushels in 1915.[12] Acres of wheat planted in the U.S.

[11] Walter Mills, *Road to War: America 1914-1917* (Boston: Houghton Mifflin Company, 1935), 97.
[12] Charles Callan Tansill, *America Goes to War* (Boston: Little, Brown and Company, 1938), 116.

rose from 53.5 million in 1914 to 60.5 million in 1915.[13] This increase was typical of this era, and these farm policies led to record breaking world crop yields and to high crop prices for farmers. Compared to 1913, before the war, American farmers produced, on average, around 25 percent more grain, and the price per bushel more than doubled during the war.[14] In July of 1919, prices peaked at around 246 percent higher than the pre-war level.[15] American farmers' profits rose dramatically during WWI. Military historian Charles Tansill wrote, "The total profits accruing to farmers in the United States from the sale of wheat increased from $56,713,000 in 1913, to $319,322,000 in 1914, and reached a peak of $642,837,000 in 1917." [16] Due to the unprecedented need for American food production, this staggering increase in production and profitability was similar in nearly all staple crop exports, such as corn, oats, barley, and rye.[17] German U-boats' economic warfare in the Atlantic kept the Allies' demand for American supplies continually high, and this U-boat activity ultimately played a decisive role in American entry into WWI.[18]

These proliferating agricultural expectations, reinforced by federal credit programs for machinery and land, led to an American agricultural sector riddled with debt, yet capable of producing more than ever. In the years following WWI, American farmers struggled to find ways to cope with the post-war agricultural slump. The "total war" market for American agriculture proved to be unsustainable. As the war ended, European countries placed tariffs on foreign goods in an attempt to rejuvenate their own domestic markets. Emil Loriks, a member of the South Dakota State Senate from 1927 through 1934, stated, "Our government had systematically done

[13] Murray R. Benedict, *Farm Policies of the United States, 1790-1950* (New York City: Octagon Books Inc., 1966), 159.

[14] Benedict, *Farm Policies of the United States, 1790-1950*, 167.

[15] Ibid., 171.

[16] Tansill, *America Goes to War* , 116.

[17] Ibid., 117.

[18] Harvey A. DeWeerd, *President Wilson Fights His War: World War I and the American Intervention* (New York: The Macmillan Company, 1968), 15.

everything wrong. We were going to take the profits out of war. The only thing we did was put a ceiling on wheat. We passed high protective tariffs, other countries retaliated."[19] American tariff activity that followed WWI quickly ended major overseas demand for American farm goods by economically- inducing war torn countries to place tariffs on American goods.

The drying up and weakening of foreign markets in the post WWI years occurred with no real change in practice on the American farm. After the Treaty of Versailles in 1919, farmers continued producing at the levels that had earned them such high prices during the war. What they failed to realize was that those prices were gone, and the market demanded changes that the farmers did not make. By the fall of 1920, prices were falling at a faster rate than they rose during the war, and inflation in America increased real prices of almost all other goods. Farmers quickly found their incomes shrinking, and their purchasing power of non-agricultural goods, due to inflation, was down to 63 percent of the pre-war level.[20]

Standards of living on farms plummeted in the 1920s, a decade of abundance, consumerism, and high-society for many living in urban America. The agricultural depression preceded the Great Depression by nearly a decade, and by the winter of 1921, "Farmers in the Dakotas and Nebraska were burning corn for fuel, and trading wool for socks and shirts."[21] A South Dakota farmer's wife wrote to a newspaper, "My husband had to buy a pair of shoes. To pay the price ($4) we brought to town twenty pounds of butter and twelve dozen eggs. That just paid for the shoes."[22] Chester C. Davis, later administrator of the Agricultural Adjustment Administration, recalled that by 1933, the Iowa hog market "had reached the stage where you

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[19] Studs Terkel, *Hard Times, An Oral History of the Great Depression* (New York City: Pantheon Books, 1970), 226.

[20] Benedict, *Farm Policies of the United States, 1790-1950*, 172.

[21] Ibid., 172.

[22] Van Perkins, *Crisis in Agriculture: The Agricultural Adjustment Administration and the New Deal, 1933* (Los Angeles: The University of California Press, 1969), 11.

almost had to tie a ten dollar bill to the ear of one of the sows before you loaded them, to even get them to market."[23] During this period, prices reflected the continuation of war output maximization levels in a market where foreign demand quickly decreased.

Even before World War I, frustrated and confused farmers had witnessed the widespread transfer of social, political, and economic power from the country to the city. Urban Americans made a better living than the typical farmer, and urban demands dictated farm production. In this new society, farmers could no longer afford simply to make a living. They had to turn large-scale profits in order to keep pace with the increasing standard of living and purchasing power offered by industry and urban America. Agriculture as a whole struggled to keep up with the modern model of supply and demand, and with rising costs and static prices, farmers struggled to keep pace.[24] The war had temporarily alleviated the struggle for viability in an increasingly modern and urban America, but the Allied victory in 1919 forcefully returned farmers to their previous state of insecurity. Overproduction mounted as debt-ridden farmers attempted to make up for falling prices with rising output. The year1914 was a watershed for farmers in America, providing temporary hope in a rural resurgence, and temporary faith in the American capitalist economic model. This resulted in massive overproduction in the post-war years and a hope that the lessons of supply and demand learned from total war production would be lasting lessons.

These total war markets were only temporary gaps of relief, in what proved to be, for American farmers, a brutal and unforgiving lesson in capitalism. Postwar deflation attacked the economy in 1920 and devastated agriculture. According to labor and agricultural historian Theodore Saloutos, the price of cotton decreased around 50 per cent from the high level of $35.34 in 1919 to only $15.89 in 1920. Furthermore, costs of production soared, increasing the

[23] Perkins, *Crisis in Agriculture*, 12.
[24] Alan Valentine, *1913: America Between Two Worlds* (New York: The Macmillan Company, 1966), 125.

weighted average index of costs to about 225 per cent of the 1910-1914 average.[25] This agricultural depression of the 1920s overpowered the unsuccessful legislative attempts by Presidents Harding, Coolidge, and Hoover, to curb the post war agricultural depression. The most notable of these was the McNary- Haugen Bill, which was vetoed in 1924, 1926, 1927, and again in 1928, offered farmers economic relief through setting prices around the pre-war level and government purchases of surpluses for overseas sale.[26] Despite numerous organizations, cooperatives, and even revolts, agriculture failed to force its way into the priorities of 1920s policy makers.

When Black Tuesday (October 29, 1929) pushed America into the Great Depression, capitalism drove farmers even further into the ground. The decade of the 1920s forced the migration of around 6 million farm people to the cities,[27] and the 1930s proved to be even more difficult. A post WWII study of this period found that in the early years of the Great Depression, "prices received by famers fell to an index of 90 in 1931 and to 68 in 1932 while the index of prices paid, taxes, and interest declined only to 142 in 1931 and 124 in 1932." [28] The National Resources Board study of consumer incomes showed that in the mid 1930s, "almost one-quarter of the 6 1/2 million farm families received less than $500 a year and about 38 per cent received less than $750 a year. This income included the retail value of farm products consumed at home. Only 8 per cent received over $2,500 a year."[29] Around one-quarter of American farms were lost to foreclosure, and this loss would have been much greater without major government aid.[30]

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[25] Theodore Saloutos, *Farmer Movements in the South, 1865-1933* (Berkeley: University of California Press, 196), 256.

[26] Ibid., 268.

[27] Arthur C. Bunce, William H. Fisher, Earle L. Rauber, "Agricultural Adjustment and Income" (*Postwar Economic Studies*, Oct. 1945), 4.

[28] Ibid., p. 4

[29] Bunce, "Agricultural Adjustment and Income," 4.

[30] Conkin, *A Revolution Down on the Farm*, 51.

As the Depression continued, farmers were now lumped into a mass of suffering Americans. The 1932 election brought a new vision, plan, and paradigm to Washington. President Franklin D. Roosevelt and his cabinet promised hope, recovery, and safety. Their promise was the "New Deal"- and for farmers, the Agricultural Adjustment Administration.[31] In the first year of the Roosevelt Administration, the President and his cabinet took drastic and unprecedented action to remedy the country's crisis. The nation was in desperate need of a more creative attack on the Depression. President Roosevelt's New Deal policies had a huge impact on the American experience during the Depression. The legislation that most impacted farmers was the Agricultural Act of May 12, 1933.[32] This act created the Agricultural Adjustment Administration, a new agency in the Department of Agriculture. This new Administration, the AAA, attempted to solve the country's crippling overproduction using price supports and acreage allotments.[33]

The duty assigned to the AAA was the central planning of private farming. They authorized a large-scale reduction in supply and production in an attempt to increase prices back to around their pre-Depression levels. Farmers were desperate for increased stability and predictability in a volatile marketplace, and the AAA offered them hope of survival. The AAA attempted to alleviate the farm overproduction and pricing crisis by strengthening the power of the central government, increasing farmers' dependence on the government, and by greatly restricting the autonomy of the farm. This program was very complicated and bureaucracy-ridden, and essentially it paid farmers not to produce on parts of their land; set farm prices at 1910 levels (when farmers had adequate purchasing power); and it centralized power through the office of the Secretary of Agriculture, who would set processing tax rates, set target prices for

[31] Perkins, *Crisis in Agriculture*, 49.
[32] Ibid., 1.
[33] Conkin, *A Revolution Down on the Farm*, 63.

farm and commodity goods, and tell farmers how much land to plant, what crops to plant, and when to plant.[34]

The federal government planned to slash farm supply and to dictate to these struggling farmers what to grow and how much to bring into the market. Output was to be cut using acreage allotments, removing usable and arable land from an individual farmer's production capabilities in order to trick the market into raising prices to the desired levels. This was an "artificial scarcity" tactic employed by Roosevelt's administration. The AAA ordered farmers to destroy crops and livestock, in order to stabilize the supply. One famous example of this forced cut in supply was the slaughtering of over six million pigs in 1933.[35] President Roosevelt later wrote in his memoirs that the public reaction to the slaughter nearly ruined the AAA. He said, "People got the idea that the AAA was synonymous with killing little pigs".[36] This illuminates one of the many paradoxes of this and subsequent farm policies. In the midst of the Great Depression, when many Americans could not afford to eat, the government was attempting to fix agriculture by destroying economic surplus. Instead of providing a great source of food for soup kitchens and community outreaches, the AAA decided to store or destroy output.

Henry A. Wallace, Roosevelt's Secretary of Agriculture, called the AAA and the passing of the Agricultural Adjustment Act a "Declaration of Interdependence" and explained to a national radio audience that farmers, distributers, and processors should not expect to sit back while the government solved their problems.[37] President Roosevelt saw this plan as both a short and long term solution to what he called the "vicious circle of unbridled competition: producing

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[34] Burton Folsom Jr., *New Deal or Raw Deal? How FDR's Economic Legacy has Damaged America* (New York City: Threshold Editions, 2008), 60.

[35] John L. Shover, *Cornbelt Rebellion, The Farmers' Holiday Association* (London: The University of Illinois Press, 1965), 140.

[36] Bernard Asbell, *The F.D.R. Memoirs* (Garden City: Doubleday & Company Inc., 1973), 108.

[37] Adam Cohen, *Nothing to Fear: FDR's Inner Circle and the Hundred Days that Created Modern America* (New York City: Penguin Books, 2009), 145.

as much as the land will yield, overfilling the market, fighting depressed prices by forcing still more from the land, ruining himself while threatening to ruin us all."[38] FDR believed that the practical and economically sound solution was that farmers simply grow less. In his memoirs, FDR wrote that a farmer producing less would "bring his supply into balance with the needs of city consumers. Automatically, prices would rise to cover the farmer's costs and a fair profit. The farmer would be saved."[39] However, as the AAA revealed, growing less was not as easy as FDR imagined it should be. As agriculture transitioned into an industrial force, output efficiency rose drastically, and new levels of output maximization meant new levels of attainable income. Science and technology gradually gave the American capitalist ethos of expansion a vehicle to reach new levels of output.

The AAA operated on federal, state, county, and local levels. Farmers that participated in the AAA, who reaped the benefits of price supports and payments for unplanted acres, were organized into local groups. These local agencies signed farmers to contracts, set quotas, enforced regulations, and distributed payments. These agencies were the farmers' meeting ground with the plans and practices of the federal government's new farm bill.[40] George L. McColm was a county agent for the AAA in 1935. He worked in the Production Marketing Administration committee of the AAA, working with Kansas farmers on the state and county level. He said, "We were getting farmers off relief by consolidating their loans, and making them a loan. The federal government was financing it, but we were carrying it on as a Kansas project... We developed that system in Kansas, and later they adopted it for the whole country."[41] A. B. Jolley, a Dallas County agricultural agent during the Great Depression, said that the Dallas

[38]Asbell, *The F.D.R. Memoirs*, 105.
[39] Ibid., 104.
[40] Conkin, *A Revolution Down on the Farm*, 65.
[41] Interview of George L. McColm, *University of North Texas Oral History Collection*, Manuscript #1095, 12-13.

County farmer "had been suffering, he had hit rock bottom, and he was looking for something that offered relief... He jumped into it in the beginning, but when he had to curtail his main cash crop, which was cotton, well then he began to question."[42] Local agents played a vital role in the operation of the AAA program, which lacked the federal man power to monitor day to day operations. Local committees assisted farmers, provided financial support, clarified the complicated federal system, and added structure to the ambiguous promises of the AAA.

The AAA did achieve relative success in raising farm prices in its early years of operation. The Administration was faced with the daunting task of reversing the effects of total war and overproduction on the agricultural market and the further damage of around 15 years of post-war production at or above wartime levels. The AAA did increase prices of certain goods, and these improvements were evident as soon as the fall of 1933, when, according to President Roosevelt, "cotton growers got nine to ten cents a pound, compared with only four and a half to five cents the previous year."[43] The tobacco industry also improved, experiencing a doubling in price from 1933 to 1934. The improvement was so dramatic and higher prices were so convincing to farmers that "97 per cent of tobacco farmers signed up for acreage reduction in 1934."[44] The price of wheat also nearly doubled, and overall farm income rose from less than $4.5 billion in 1932 to almost $7 billion in 1935. The President said that the AAA had "immediate and dramatic" results, and that "surpluses were reduced, prices rose, and farmers were more secure."[45]

This short run success for farm prices was obfuscated by an economy that recovered slower than New Deal optimists had hoped, and the broader impact of economic and natural laws

[42] Interview of A. B. Jolley, *University of North Texas Oral History Collection*, Manuscript #99, 45.
[43] Asbell, *The F.D.R. Memoirs*, 108.
[44] Asbell, *The F.D.R. Memoirs*, 108.
[45] Ibid., 109.

revealed the deeper realities of the AAA. New Deal farm policy failed to alter the mindset within American agriculture that caused the overproduction of the 1920s. The expansion of demand caused by total war during WWI strengthened the culture of capitalism among American farmers and reinforced the connection between natural exploitation and monetary gain. The AAA allocated more benefits to large-scale producers, and this decision led to continued suffering for small farmers. Historian Donald Worster said of the AAA, "It did not improve the lot of the large number of poor, marginal farmers, nor did it control effectively the big, well-capitalized growers."[46] Small farmers could not physically cut enough acres from their land to warrant a meaningful payment from the AAA, yet large farmers could cut off 40 per cent of their worst land, still produce more than necessary, and receive large acreage payments. Rather than a philosophical change in agricultural practice in America, it resulted in freezing the economic status quo.[47] The AAA led to further consolidation and monopolization of food supply in America during the Great Depression. Wealthy producers bought the land of the poor farmers, and this led to continued overproduction. Agricultural and environmental historian Donald Worster wrote in *Dust Bowl: The Southern Plains in the 1930s* that in 1936, "Kansas had more wheat planted than it had had at any time in its history."[48] No program or incentive in the AAA convinced farmers to think differently about their relationship with the natural world. The agricultural system of overproduction and exploitation was simply propped up and allowed to survive with no long term changes, and what emerged was a welfare state in a corporately-dominated American agriculture, a model that still exists today.[49]

[46] Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York: Oxford University Press, 1979), 158.
[47] Ibid., 158.
[48] Worster, *Dust Bowl*, 158.
[49] Ibid., 163.

An interesting effect of the AAA was the increased dependence on imported food and clothing in America. By 1935, the U.S. was a major importer of food, despite having the capacity to provide inexpensive food and clothing to Americans in the midst of the Great Depression. Total war brought about the massive explosion of American food and cotton exports, and the AAA, the legislation that promised to ease the harsh effects that total war had on American agriculture, ushered America into a state of import dependence. This failure of the AAA is an iconic irony of governmental interference. Economic historian Burton Folsom Jr. wrote, "In 1933, the U.S. was plowing under 10 million acres of cotton and killing 6 million piglets; in 1935, the U.S. was importing 36 million bales of cotton and 2 million pounds of ham and bacon. We were also importing other basic commodities- butter, corn, and even wheat."[50] Some of these imports were necessitated by a series of droughts that plagued America in the mid 1930s. FDR said of the severe drought in 1934, "We must share some of the credit with nature. The drought of 1934, particularly hard on wheat, was an effective crop-reduction program of its own."[51] This dependence on imported goods, in a time of unprecedented production capabilities and starving citizens, placed the economic burden on the masses, and continued the operation of agriculture outside of the realm of economic rationality.

Another failure of the AAA was the method of funding these acreage payments and food subsidy guarantees. These payments for unplanted acres and price guarantees were funded, for the most part, by taxes paid by food processing companies, who passed these costs on to the consumer by way of higher prices. The AAA attempted to fix the depression in agriculture by cutting supply, taxing processing, and increasing food prices. Non-farming consumers felt the effects of this policy most urgently. Millions of citizens watched monetary values plummet and

[50] Folsom Jr., *New Deal or Raw Deal?*, 67.
[51] Asbell, *The F.D.R. Memoirs*, 108.

costs of sustenance rise during the years of the New Deal. Historian Paul Conkin wrote, "Obviously it would take from Peter to pay Paul, cutting consumption in one area to pay producers in another, probably decreasing consumption fully as much among consumers as a whole as it increased the purchases of farmers."[52] The AAA did achieve some level of economic forgiveness for farmers, but harmed the total purchasing power of the economy as a whole.

The AAA also failed to take into account technological advances that led to greater agricultural yields. An agricultural study done by the Board of Governors of the Federal Reserve System in 1945 revealed that the decrease in acres planted had not had a significant impact on the amount of agricultural products in the American market. This study was an attempt to find solutions for agriculture in the post WWII period, and these economists used the AAA and its dealing with the post WWI overproduction. The study states:

> In the past we have attempted to control supply through imposing controls over acreages and through quota allotments. Many claim that we will have to follow this same policy in the postwar period. This, however, is not easy to do. Acreage controls in the past were effective in shifting the acreages of various crops but not in reducing total production. In the case of corn the average acreage from 1931 to 1933 was 108 million acres and production averaged 2.6 billion bushels; for the three years, 1939-1941, the acreage under the AAA averaged only 87 million acres but production still averaged 2.6 million bushels. Essentially, therefore, acreage controls only prevented an expansion of production between these two periods. Production did not decline because hybrid corn and improved rotations increased yields...In the case of cotton the yield increases have been even more dramatic and have averaged 50 per cent higher. [53]

American farmers under the AAA could cut off their worst acres, receive payments from the federal government for not planting these acres, and still produce at the same level, receiving a higher, tax-supported price for their production. The AAA was far from successful at curbing American overproduction in the wake of World War I. These programs simply gave farmers

[52] Paul K. Conkin, *The New Deal* (New York: The Thomas Y. Crowell Company, 1967), 41.

[53] Bunce, "Agricultural Adjustment And Income", 16.

another means to make money outside of normal market conditions, set precedents for governmental control in agriculture, and allowed a failed economic model in agriculture to continue throughout the rest of the twentieth century.

The Agricultural Adjustment Administration, as it was planned to be operated in its incipient stages in 1933, was declared unconstitutional and a barrier to free trade. The processing tax provision of the AAA was declared unconstitutional in January of 1936 in *United States vs. Butler*.[54] FDR said of this Supreme Court Decision: "On January 6, 1936, the farmers of America- all the people of America- were struck a great blow. Not by drought or storm, not by the fury of nature or economics, but by the United States Supreme Court. By a margin of a single vote, the aging majority of that Court, their thoughts still mired in the back roads of the horse-and-buggy era, declared the AAA unconstitutional."[55] This piece of legislation was the federal government's plan for regulating and stabilizing the market for American agriculture, and the AAA attempted to repair a domestic system of production drastically altered by total war. This system failed, but despite its economic inefficiency, continued to live on as an essential component of federal farm policy for decades.

This failure, however, did not stymie the march of agricultural subsidies and economic aid. The program was reorganized and reintroduced as a conservation administration and continued to carry on funded through the treasury instead of tax. The AAA that followed *United States vs. Butler* was very similar in practice for farmers. In a USDA press release, Secretary Henry A. Wallace stated that the new AAA sought to create an "ever-normal granary"[56] for the price protection of farmers and consumers. The idea behind this farm program was that the

[54] Benedict, *Farm Policies of the United States, 1790-1950*, 375.
[55] Asbell, *The F.D.R. Memoirs*, 109.
[56] USDA Press Release, *The New Agricultural Adjustment Administration*, Feb. 16, 1938 (Washington D.C.: U.S. Government Printing Office, 1938).

economic impact of market fluctuations would not be felt by struggling farmers or by the consumer. Despite continued overproduction that proved to increase substantially for WWII economic expansion, farmers could continue to produce at record high levels with federal price protection. And why wouldn't they continue to maximize their output? Farmers had been struggling financially for the majority of the century, and they faced debt, unstable prices, and expensive input costs. Capitalism had not been fair to agriculture, so federal price stability was a major relief for farmers. As long as farmers played by the AAA's rules, they received stable and subsidized prices for what they brought to the market as well as payments for the acreage that they reserved for natural reclamation. The reconstructed AAA created a bureaucracy of local agents and divisional production quotas that efficiently monitored and guided farmers to national agricultural goals. This complex rural structure made production expansions for WWII incredibly efficient and continued the economic ethic of overproduction in American agriculture.

The Second World War, Enhanced Postwar Overproduction, and the Soil Bank Act

When Nazi Germany invaded Poland in the fall of 1939, Europe again found itself on the brink of total war, and in desperate need of foreign aid. World War II proved to be the event that the American economy, specifically the agricultural sector of the economy, needed to dig itself out of the depths of the Great Depression. In his 1939 pamphlet titled "Rural Relief and Recovery," sociologist Rupert B. Vance demonstrated the dire situation that still existed in American agriculture just prior to WWII demand. This pamphlet, destined for cabinet members and congressmen and women, stated, "American agriculture was expanded abnormally to meet the abnormally great demands of warring Europe for grain. After the war not only did this abnormal demand come to an end, but improved agricultural efficiency everywhere cut down

severely the former normal export market for American farm products. There was a world-wide surplus of grains and a collapse of world prices. With American agriculture geared to peak production, the export market ceased to exist."[57] This source demonstrates the struggles that continued to plague American agriculture even on the brink of increased demand due to total war. The "improved agricultural efficiency" that Vance speaks of not only cut down export markets, but it sabotaged the federal government's attempt at controlling production through acreage allotments. Cutting acres out of production could not overcome the extreme influx of capital and technology into agriculture, which increased overproduction despite farmers' removal or arable farmland. What over a decade of federal depression policy could not fundamentally remedy, total war quickly rejuvenated. Not only did war temporarily validate the residual overproduction from WWI that had lasted almost two decades, it set a new level of output maximization, a level that would again, like WWI, continue and expand in the postwar years. The war began a new era in American farming, but under economic conditions strikingly similar to the preceding World War. This catastrophic war, though miraculously beneficial to a suffocating economy, created a boom of foreign demand and washed the memories of American farmers and policy makers of the dangers of overproduction. Advances in machine and chemical technologies allowed American agriculture to quickly increase the volume of production, building a stronger Allied war effort. This effort, however necessary, had profound social, environmental, and economic consequences in the post war years.

In a sense, total war production for WWII nullified most of the policies and practices aimed at solving the crisis caused by total war production for WWI. Historian Paul Conkin wrote, "Like World War I, the Second World War meant higher prices for almost all farm

[57] Rupert B. Vance, *Rural Relief and Recovery* (Washington D.C.: U.S. Government Printing Office, 1939), 8.

products. A high demand for food crops, based largely on events in Europe, quickly used up all the surpluses held by the Commodity Credit Corporation. The acreage controls and price supports of the 1938 Agricultural Adjustment Act were largely unneeded."[58] The Second World War led to economic legislation that benefited farmers greatly, legislation that further entrenched the capitalist ethos of expansion and output maximization. The passing of The Lend-Lease Act of 1941 allowed for a massive expansion of foreign markets for agricultural exports. This act, passed and practiced prior to American entry in the war, enabled the United States to aid any country that in some way provided national security to the United States. Lend-Lease was the most important American plan aimed at Allied aid prior to America's entry into WWII. The Lend-Lease Act empowered the government to purchase surplus production, and ship products abroad for Allied use. This Act is better known for its exports of munitions, ships, aircraft, manufacturing, and vehicles, but Lend-Lease further increased the production expectations of American farmers. In the farming sector, much like the munitions industry, according to agricultural historian Murray Benedict, "the all-important requirement was to get increased production and get it quickly."[59] For example, the production goals for 1942 called for "increases of 8 per cent in milk production; 6 per cent in corn production; 73 per cent for dry peas; 150 per cent for peanuts; 34 per cent for flax seed; 10 per cent for flue-cured tobacco and rice; and substantially more sugar"[60] as compared to 1941 output.

By the end of 1942, European countries found themselves increasingly dependent on what President Roosevelt called "the ever-rising flow of supplies."[61] The American government responded with even more incentives for overproduction for American farmers. In December of

[58]Conkin, *A Revolution Down on the Farm,* 77.
[59] Benedict, *Farm Policies of the United States, 1790-1950,* 431.
[60] Ibid., 433.
[61] Asbell, *The F.D.R. Memoirs*, 390.

1942, the Secretary of Agriculture Claude Wickard announced that crop payments would now only be made to farms meeting or nearly reaching production goals. Furthermore, the Department of Agriculture promised a $100 million program of bonus payments to farmers who produced 90 to 100 per cent of their higher goals. In previous years, payments were only made to those who cut enough acres from production. This marked a distinct break from Great Depression era policies of output restriction. In January of 1943, the Secretary of Agriculture announced commercial farm operations would be allowed to overplant corn without penalties, and more than $200 million of additional credit was made available for farmers producing war crops.[62] In order to produce on these incentivized levels, farmers invested heavily in their own operations, often getting in debt. Expansions such as these led to severe financial trouble when this demand dried out. Farmers now depended on maximizing their output just to get by- even at depressed prices, farmers were economically forced to overproduce.

The bureaucratic foundation laid by the old AAA of country, state, and regional agents facilitated this drastic expansion of agricultural production for total war. In the *Annual Statistical Report: Agricultural Conservation and Related Programs(Western Region),* conducted by the USDA in 1944, these committee men were praised for their work in coordinating agricultural expansion for war. These bureaucrats "took the national and state goals from the paper to the action front and worked with farmers to obtain for the nation the high production needed to keep a solid food foundation under the all-out war effort."[63] The use of the word "front" in this report signifies the interconnectedness of domestic agricultural production and patriotic duty. American agriculture's commitment to maximizing output was analogous to the U.S. Armed Forces'

[62] Benedict, *Farm Policies of the United States, 1790-1950*, 434.

[63] USDA Production and Marketing Administration Field Service Branch, *Annual Statistical Report: Agricultural Conservation and Related Programs(Western Region)* (Washington D.C.: U.S. Government Printing Office, 1945), 18.

commitment to stamping out certain countries and ideologies that threatened American democracy and freedom.

Surprisingly, despite record-breaking production, the amount of acres planted did not drastically increase. Furthermore, despite domestic food rationing, American civilians consumed by far the highest amounts of per capita calories in American history.[64] During the WWII period, higher output was possible without increasing acreage due to improvements in chemical fertilization and irrigation, hybrid and modified seeds, and mechanical and vehicle prevalence. Insecticides and fungicides, along with chemical fertilizers made these efficient yields possible. Fertilizers made crop rotation unnecessary by supplying the soil with synthetic nutrients and preventing soil exhaustion, and chemical insecticides such as DDT rid fields of costly pests.[65] These advances in science, technology, and research and development allowed farmers to receive great financial benefit from total war. This technological revolution also had an environmental impact that is still being fully realized today, playing a major role in the continuation of destructive and exhaustive practices in farming.[66]

By the end of WWII, American agriculture was at the peak of its long and tumultuous economic history. Total war performed a financial miracle in American farming, and transformed a broken, antiquated, and downtrodden victim of modern capitalism into a booming component of a vital post-war economy. Financially, historian Murray Benedict wrote that farmers' "bank deposits and currency holdings had moved up from $3.9 billion on January 1,1940 to approximately $14 billion on January 1, 1946."[67] Farmers also saw a decrease in total debt. Overall, farm land value rose, and "was now valued at $56.5 billion as compared to $33.6

[64] Benedict, *Farm Policies of the United States, 1790-1950,* 443.
[65] Conkin, *A Revolution Down on the Farm,* 112.
[66] For more on chemicals, see Edmund Russell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge: Cambridge University Press, 2001).
[67] Benedict, *Farm Policies of the United States, 1790-1950,* 459.

billion in 1940."[68] This economic peak continued in the late 1940s and early 1950s as farmers continued to enjoy an expanded domestic market due to Marshall Plan aid and war in Korea. In a 1954 issue of *Capper's Farmer* magazine, an article called "How America is Changing" stated that "farmers are producing 31% more farm products than in 1940- even though the number of people living on farms has fallen 20%."[69] High price supports kept prices high during the Korean War, and only tobacco and peanuts were subject to production and acreage limitation.[70] The prosperous years during WWII, much like those during WWI, were times of much needed relief for farmers struggling to maintain their way of life in an increasingly modern, urban, and corporate landscape. Unfortunately for farmers, total war was not a harbinger of continued economic viability but ultimately served as a crutch for a broken system. Massive overproduction in the twentieth century allowed this unsustainable system, both heavily dependent on federal funding and destructive to its environment, to continue. Overproduction became a foundation for the modern food system rather than a sign that the market was operating outside of equilibrium.

America in the 1950s saw unparalleled economic benefits of peacetime. With a highly profitable urban market operating near full employment, the Great Depression was clearly remedied, and many Americans experienced the realities of the American dream. Farmers experienced this abundance, as the prosperity of the post war years sustained their hope for continued growth, and instilled in their minds the benefits of output maximization. This economic lesson, however incorrect, was perhaps the most lasting impact of World War II on American agriculture. The idea that continued output maximization could yield a sustainable

[68] Benedict, *Farm Policies of the United States, 1790-1950*, 459.
[69] Francis A. Kutish, "Will You Make Money In 1954?" (*Capper's Farmer*, Jan. 1954), 48.
[70] Earl O. Heady, *A Primer on Food, Agriculture, and Public Policy* (New York: Random House, 1967), 73.

future for farmers was a direct result of the successes that they experienced from total war. Had farmers continued through WWII without the economic benefits of an unprecedented boom in demand, overproduction might not have had such a strong hold on agricultural policies and practices. Farm expansion due to WWII made farmers dependent on overproduction in order to maintain their financial situation. Chemical and seed technology aided this continued expansion of output. An attitude of progress and expansion swept the post war nation, including agriculture. Farmers saw a future where they held a vital position in a thriving and ever-expanding economy. This mindset, cemented by the economic successes 1950s, led to problems in agriculture similar to those that followed WWI, and a governmental response under President Eisenhower similar to FDR's plan.

Historian Earl O. Heady said of the period following World War I through World War II, that "farming has changed a lot in thirty years, but farm problems and policies have not."[71] Farmers' extractive use of American farmlands, and furthermore, the economic ethic that monetarily reinforced this practice in the first half of the twentieth century created these problems in modern agriculture. The federal response has been, and continues to be today, price supports for crops that are overproduced. In other words, the government allows the agricultural market to operate as a failed economic system, and the financial losses to impact the treasury and the consumer. A post war economic study conducted by the Rockefeller panel, argued "the consumer pays for the program in two ways: higher taxes and higher farm prices." Furthermore, this panel stated that that price supports of "commodities above the levels they would have reached in the market- has hampered, rather than facilitated, the needed adjustment." In the mid to late 1950s, farmers began to see the economic reaction to their overproduction. "High, fixed price supports, adopted during World War II, were scheduled to be reduced within two years

[71] Heady, *A Primer on Food*, 171.

after the war. The reduction has been successively postponed however. The result has been overproduction, depressed markets, and lagging incomes."[72]

When President Eisenhower took office in 1953, these systemic problems in agriculture demanded a solution. Farmers were dependent on price-supported and overproduced crops to remain profitable. In a 1954 issue of *Capper's Farmer* magazine, economist Francis A. Kutish offered readers a detailed breakdown of the crops earning the highest federal price supports in his article "Will you make money in 1954?" he wrote that "For most farm people, 1954 promises to be an "in-between" year for income- a year of neither feast nor famine. It will be good compared with the late 1930s; not so good in relation to the late 1940s." But despite unstable prices and wasteful overproduction, the article urges farmers, "1954 is not a year for farmers to slow down."[73] The economic problems in agriculture were of importance to President Eisenhower. Eisenhower's early policies in agriculture, such as flexible price supports and trying to move agriculture closer to the open market, were generally seen as attempts to overturn New Deal agricultural policies.[74]As these policies failed to curb overproduction and price depression, the Eisenhower administration, according to historian Charles C. Alexander, "accepted and perpetuated the basic reality of the welfare state" in agriculture.[75] In President Eisenhower's memoirs, he includes a letter from his brother, Edgar, written to him in 1955. His brother wrote, "I am about to make a public blast against the government subsidies to the farmers, but before doing so, I thought that you might give me some moral or economic reason why we should subsidize the farmer. I am sick of paying the farmer money for his product, wasting that product,

[72] Rockefeller Brothers Fund, *Prospect for America: The Rockefeller Panel Reports* (Garden City: Doubleday & Company, Inc., 1961), 294.

[73] Kutish, "Will You Make Money In 1954?", 21.

[74] Charles C. Alexander, *Holding the Line: The Eisenhower Era 1952-1961* (Ontario: Fitzhenry & Whiteside Limited, 1975), 39.

[75] Ibid., 40.

and then paying him a higher price for what he puts into the market!"[76] Edgar Eisenhower's concerns were shared by much of the nation, and President Eisenhower's plan varied very little from modern agricultural policy status quo.

President Eisenhower's seminal attempt to fix agriculture was The Agricultural Act of 1956, also known as the Soil Bank Act. This program, despite Eisenhower's disdain for New Deal agricultural policy, had its roots in FDR's AAA. The Soil Bank Act's continuation of the Agricultural Adjustment Administration's policies, at a crucial moment when a more egalitarian and sustainable path could have been taken, had a undeniable impact on the future of American industrial farming, and greatly contributed to the multinational corporate dominance of American food production.

President Eisenhower's Agricultural Act of 1956, also known as the Soil Bank, was comprised of the Acreage Reserve Program and the Conservation Reserve Program. The Conservation Reserve was a federal attempt to reclaim portions of cleared and cultivated land for environmental investment. Historian Paul K. Conkin summarized the tenants of the Soil Bank Program by saying, "Farmers could enter into contracts to retire cultivated land, whatever the former crop, for three to ten years...Farmers received a low rent for the land and extra payments for various conservation measures (tree planting, holding dams, wildlife protection)."[77] In 1957, the USDA found that most farmers that participated in the Conservation Reserve "indicated that annual rental and practice payments were adequate for cropland not irrigated. They indicated that payments were high enough to be attractive for poor land but not for good or irrigated land."[78] According to the USDA, "slightly less than 2 per cent of all farms had Conservation Reserve

[76] Dwight D. Eisenhower, *Mandate for Change, 1953-1956* (Garden City, New York: Doubleday & Company, INC., 1968), 559.

[77] Conkin, *A Revolution Down on the Farm*, 129.

[78] *USDA Agricultural Research Service*, "The Conservation Reserve Program of the Soil Bank, Effect in Selected Areas, 1957," Washington D.C.: Agricultural Research Service, USDA, March 1958), 25.

contracts in 1957. The total acreage placed in the program was equivalent to about 1.5 per cent of total crop land as reported by the 1954 Census of Agriculture."[79] The acreage in the Conservation Program peaked at just over 28 million acres, and most of this conserved land was marginal farm land, resulting in a miniscule effect on output. The Conservation Reserve segment of the Agricultural Act of 1956 was abandoned in 1960, as policy began to reflect the values of mass production and mass consumption.[80] The CRP has since been reinstated, and has been a part of agricultural policy for decades. Today, the CRP is widely used as a method for earning additional income by setting aside marginal land for conservation.

The Acreage Reserve Program of the Soil Bank program allowed payments to farmers who agreed to take acreage out of production under one year contracts. This program had the most direct impact on farm prices, and this reserve program was President Eisenhower's attempt to continue the economic steering of agriculture through price supports and cutting acres out of production. This was separate from the Conservation Reserve Program, and very similar to the Agricultural Adjustment Administration during the New Deal. The Soil Bank's Acreage Reserve was not an attempt to allow the land to revert to its pre-cultivated state, but a short term program aimed at reducing overproduction. Farmers and farm corporations that committed land to the Soil Bank received federal money from two major sources: direct cash payment for participation, and the higher market prices as agricultural output is reduced by way of CCC purchases.[81] The Agricultural Research Service of the United Stated Department of Agriculture, in a 1958 study of the Soil Bank's effectiveness, stated that "National average payments per acre on agreements in 1957 were approximately as follows: Wheat $18, cotton $51, corn $38, rice $64, and tobacco

[79] *USDA Agricultural Research Service*, "The Conservation Reserve Program of the Soil Bank, Effect in Selected Areas, 1957," 7.

[80] Conkin, *A Revolution Down on the Farm*, 130.

[81] Heady, *A Primer on Food*, 138.

$223." The study stated that these cuts in acreage were vital, because "large stocks of these commodities have been accumulated in recent years because production has been larger than market outlets at the prices that have prevailed."[82] This program also continued support prices for farmers, and surplus production was purchased and stored by the federal government. Again, instead of putting these acres to good use by providing affordable produce to impoverished areas, government subsidies enhanced production, and government money bought the surpluses that they helped create a financial incentive for.

This program was highly inefficient and only marginally successfully, largely due to the ability of farmers to plant feed grains on their retired land. In other words, on the land that farmers were paid to reserve, they could grow various other crops, and receive supported prices for those crops.[83] Production continued to grow, despite this attempt to pay farmers to produce less. Any decreases in production were offset by increases in productivity, and overall yields continued to rise in all but one year.[84] Historian Earl O. Heady wrote that by 1959, the Commodity Credit Corporation, the New Deal department that established price supports and bought surpluses, "held in storage $2.4 billion of wheat, $891 million of corn, and $706 million of grain sorghums."[85] After conducting a study of the Soil Bank in Oregon, economists William G. Brown and Pius Weisgerber concluded that, "It may be that the traditional method of trying to adjust our agricultural production by merely regulating the quantity of land input can never work satisfactory."[86] The failure of these two legislative attempts seem to validate the economists' assertions. An article written on cotton production in the Soil Bank, stated that "several years

[82] USDA, "The Conservation Reserve Program of the Soil Bank, Effects in Selected Areas, 1957", 5.
[83] Heady, *A Primer on Food*, 75.
[84] Conkin, *A Revolution Down on the Farm*, 129.
[85] Heady, *A Primer on Food*, 75.
[86] William G Brown and Pius Weisgerber, "An Appraisal of the Soil Bank Program in the Wheat Summer Fallow Area of Oregon." (*Journal of Farm Economics, Vol. 40, No. 1, Feb. 1958*), 148.

would be needed to have much effect on the present stocks of approximately 14 million bales."[87] Production controls in both the post WWI and post WWII periods had a negligible effect on surplus and only managed to decrease production enough to slightly slow the growth of production due to America's rapidly improving technology in agriculture.

The Eisenhower administration failed to effectively ameliorate the situation in post WWII American agriculture. The administration and the USDA found no sustainable method of maintaining stable and fair prices or of decreasing surplus production. Many of the largest and most efficient farmers elected to not participate in the Soil Bank program, and even those industrial-sized farm operations that did, replaced their lost production from retired acres with improved yields from other land. According to historian Earl O. Heady, from 1952 to 1959, the last year of the Soil Bank's existence, the total of price-support inventories held by the Commodity Credit Corporation "grew from $1.3 billion in 1952 to $7.7 billion in 1959."[88] The Soil Bank Program lasted only three years, and in 1959, policymakers decided to take a different approach in agriculture. In 1959, the USDA dropped acreage controls for certain commodities altogether. While the economic tactic of acreage control would resurface in political discourse, the federal government in the second half of the twentieth century overwhelmingly sided with the consumer and adopted policies of subsidized overproduction and low food prices. The result of this political transition was soaring production, surpluses, and federal money in agriculture, along with plummeting prices for modern processed food.

President Eisenhower's Soil Bank Program of 1956, leaning mainly on previous legislative attempts at surplus alleviation, suffered the same fate as the AAA and subsequent policies in the 1940s. Blinded by the temporary economic benefits of total war on agriculture, the

[87] W.L. Dorries, "How Will the Soil Bank Program Affect Cotton Production?" (*Journal of Farm Economics, Vol. 39, No. 1, Feb. 1957)*, 167.

[88] Heady, *A Primer on Food*, 78.

Eisenhower administration failed to construct a policy that offered a more sustainable and economically egalitarian way for farmers to relate to their work and environment. Farm production became highly consolidated during the Great Depression, as wealthier farmers and corporations purchased land, overpowered smaller growers, and received the lion's share of federal benefits from crop price supports and payments for acreage reductions. This trend continued during WWII and throughout the 1950s. President Eisenhower wrote in his memoirs, that "The pitiful result of this state of affairs is that by and large it enriched those who needed no help and was almost useless to the "small farmers"- those who live and operate on the thin, ragged edge of poverty."[89] Corporate and industrial agriculture benefited greatly from major legislation aimed at aiding the agricultural market, failing due to overproduction. As smaller farms left the market or went through foreclosure, large scale growers strengthened their hold on American lands and the American food supply. These large scale growers, most capable of continually maximizing output and most entrenched with industrial and capitalistic ethics towards land and crops, emerged from decades of liberal policies aimed at controlling the growth of corporate interests stronger than ever.

In the long run, as Eisenhower's words suggest, industrial food and "agribusiness" have proven to be the greatest beneficiaries of these policies enacted to combat total war's impact on 20th century agriculture. As early as 1955, Secretary Ezra Taft Benson advocated corporate control to "rationalize" agriculture.[90] John Davis coined the term "agribusiness," and this trend towards corporate control of farming was present prior to the passing of the Soil Bank. President Eisenhower's Secretary of Agriculture Ezra Taft Benson "told farmers to get big or get out"[91] of

[89] Eisenhower, *Mandate for Change*, 562.

[90] Wendell Berry, *The Unsettling of America: Culture and Agriculture* (San Francisco: Sierra Club Books, 1977), 152.

[91] Ibid., 152.

American agriculture. President Eisenhower's administration was in control in a watershed period for agriculture. His administration was faced with economic and cultural revolutions in the post-WWII years and was also in the midst of a massive transfer of power in the American food system. This administration could have moved against an agricultural system that overwhelmingly favored subsidized corporate and multinational farming. Economically competitive local food markets could have been supported by the federal government on a much smaller financial and bureaucratic scale. Federal support of a more localized food model would have greatly affected the political economy of postwar agriculture, and spread the financial benefits of American agricultural production more equally among those who produced the crops, rather than enriching food processing corporations. Local systems, while certainly not flawless in their own right, present the opportunity for supply and demand to be felt by direct producers and consumers, and are better positioned to deal with finite natural resources and fuel costs.

These New Deal and post WWII policies of economic liberalism were centered around the idea that, as historian Shane Hamilton writes, "the government could and should manage the economy to maintain business stability, worker prosperity, and consumer purchasing power."[92] New Deal policies protected labor, and these policies promised to support the small farmer as well and attempted to contest the power of industrial capitalism in farming. By the mid 1950s, however, agribusiness capitalized on the increasing consolidation and industrialization in agriculture. These food giants became icons of modernity in post WWII America, and their ability to mass produce luxuries for suburban America had a profound impact on the American experience. Food marketing expanded demand for convenient, processed, and pre-packaged goods from agribusiness.[93] Under the New Deal, farm pricing policy aimed at raising the prices

[92] Hamilton, *Trucking Country,* 3.
[93] Ibid., 120-132.

of farm products and paying the farmers the amount above market value. Beginning during the Eisenhower Administration, with the shift to federal protection of agribusiness, the federal government promoted cheap, mass produced and distributed food. This meant government subsidies now paid these corporations instead of farmers, and they were compensated for purposefully producing at high levels that guaranteed prices to remain low. This transition marked the end of federal subsidies aimed at returning agriculture to some sort of balanced and sustainable market level. From the end of the Eisenhower administration until the present, food companies have been subsidized to operate under costs of production and to keep prices low for the American consumer.

The environmental impact of industrial agriculture has been unfathomable. The failure of these two pieces of post-war legislation in altering the path of corporate control over food has resulted in a completely new ecology in farming. Agribusiness and its corporate confidants are drastically and rapidly changing traditional relationships between human and non-human by depleting land, necessitating chemical dependence in food, poisoning precious water sources, and much more.[94] By institutionalizing overproduction, total war played a major role in creating this caustic environment in American farming. Throughout this crucial evolutionary period of World Wars, economic booms and busts, and social transformations, ideas of economic maximization became intrinsically connected with a new type of agriculture, one that symbolized the limitless possibilities of America throughout the second half of the twentieth century.

According to agricultural historian Paul Conkin, the future of this unsustainable relationship between industry and agriculture is more vexing than its history. Moving forward,

[94] Wendell Berry, in *The Unsettling of America: Culture and Agriculture*, wrote that modern agriculture is "depleting the soil of certain specific nutrients and thus requiring larger amounts of fertilizer. This increase in the use of fertilizer has been accompanied by an increased use of pesticides and more intensive (that is, more continuous) cultivation. The burden placed on streams and lakes by the runoff of silt and farm chemicals has therefore increased.", 164.

the food system will face "the end of cheap oil, and thus higher fuel and fertilizer costs; more rigorous conservation and pesticide legislation; and a warming climate, with more extreme weather events and more constraints on water use."[95] The productivity revolution of the 20th century was made possible by seemingly limitless resources, cheap energy, water availability, and cheap chemicals. Agribusiness still depends on these inputs and continues to be subsidized accordingly.

In conclusion, demand booms for World War I and World War II drastically altered the course of American agriculture. The policies enacted during the crucial periods following these wars, most notably the Agricultural Adjustment Administration and the Soil Bank Program, played a major role in determining the cloudy future for agriculture in America and provided for systemic and exhaustive overproduction on American farms. Agricultural anthropologist Walter Goldschmidt stated that "this growth of corporate agriculture is not inevitable nor simply a product of efficiency, but it is rather a result f national policies favorable to large-scale enterprises."[96] The importance of total war on American agriculture has not been the productivity revolution of the 20th century. Higher productivity created, according to agricultural historian David B. Danbom, a "highly capitalized and technologically sophisticated agricultural system, but one with unanticipated environmental, economic, and social side effects."[97] Total war's most lasting impact on domestic agriculture in America has been its propping up of a failed, unsustainable, and economically and socially destructive food system. World War I and II were rare booms in a bust cycle in agriculture that has lasted from the early twentieth to the early twenty-first centuries. These wars were band aids that prevented creative and prescient policies from existence. Historian Murray R. Benedict wrote in 1966, that "it would seem to be

[95]Conkin, *A Revolution Down on the Farm*, 198.
[96] Gardner, *American Agriculture in the Twentieth Century*, 125.
[97] Danbom, *Born in the Country*, 257.

unrealistic to expect a situation of almost chronic depression in agriculture and a need for virtually continuous governmental intervention in its behalf."[98] This, however, is exactly the environment that has resulted from these governmental policies that attempted to deal with overproduction and corporate agriculture. Agriculture continues to operate in a manner that cannot be sustained. Agricultural policy still favors this ethos of abundance and maximization set in motion by total war. Modern food is dependent on government money, exists in a failed economic state, and operates under the auspices of unprecedented federal and corporate control. These two decades of postwar economic expansion in America, the 1920s and 1950s, could have been treated as periods of recovery for agriculture. Instead, these periods of continued overproduction steered agriculture rapidly towards mass production and consolidation. The characteristics of today's mass produced and consumed agricultural sector are results of rampant overproduction and ever- expanding levels of maximization in domestic farming.

[98] Benedict, *Farm Policies of the United States, 1790-1950*, 520.

CHAPTER 3

AMERICAN CORN OVERPRODUCTION THROUGHOUT THE LAST CENTURY

The ascendance of corn as a staple crop is a prime example of the power of technological innovation and improved efficiency in agriculture following World War II. Few agricultural products have undergone such a mighty elevation, and very few plants are capable of such mobility. Technology and industry have created a world in which corn can flourish, providing not only a seemingly endless supply of calorie-dense food, but more importantly for modern agriculture, a cheap industrial input. According to the USDA, the majority of the 80 million acres of American corn are used as an industrial input. These uses include feed for meat production, and, according to the USDA, "a multitude of food and industrial products including starch, sweeteners, corn oil, beverage and industrial alcohol, and fuel ethanol."[99] Corn is ubiquitous in the American diet and in the diet of animals that Americans eat, and total war has played an unmistakable role in this development.

Corn production has grown at a rate disproportionately higher than the rate of population growth due to its flexibility and adaptability. This chapter focuses on the impact that total war demand has had on corn in America. The main interest here lies in studying the changes in output in the corn industry during war time and peace time, and the overall trend towards more and more corn. Corn dominates the modern American food supply, largely because of subsidized overproduction resulting from total war. Food and agricultural writer Michael Pollan wrote that "corn's triumph is the direct result of its overproduction."[100] This succinct summary of corn's recent history does not fully realize the complexities of economic expansion in agriculture in the

[99] USDA Economic Research Service, *Corn Overview*, http://www.ers.usda.gov/topics/crops/corn.aspx. (Accessed March, 11, 2014.)

[100] Michael Pollan, *The Omnivore's Dilemma: A Natural History of Four Meals* (New York: Penguin Books, 2007), 118.

twentieth century. I would argue that corn's overproduction is the direct result of the dominion of science and industry in agriculture, and that corn's triumph is the result of the failure of federal policies in dealing with overproduction. Specific policies, such as the Agricultural Adjustment Administration, the Soil Bank Act, the Brannon Plan, the Lend-Lease Act, and the Marshall Plan, had noteworthy impacts on cementing corn's place as the right hand of industrial agriculture.

Beyond demand booms and subsidy payments, total war has played various other roles in corn's explosion of production. Chemical companies transitioned from weapons to food sciences, creating cheap, synthetic sweeteners, fillers, and binders for processed food. Companies involved in munitions also moved into agricultural sciences, developing highly effective fertilizers and seeds that maximized yields and limited waste. The availability of cheap corn as an industrial input for processed foods further propelled corn, providing for cheap convenience foods that came to be associated with the new American family following WWII. This cheap abundance of corn pushed the federal government to explore using plants as a source of fuel, and what better source than the heavily subsidized and heavily overproduced corn? Total war helped to create such an economic culture of overproduction in agriculture that the government decided to burn corn surpluses as fuel.

The government's major push to transition its war machine to peacetime purposes in agriculture resulted in various new uses for corn surpluses.[101] In the years following WWII, corn was no longer seen as overproduced but inefficiently used. All of these new repositories for the ever growing bulk of overproduced corn were new and efficient ways to reconfigure corn into value added products that revolutionized an entire food system. This drastic transition in thought followed the two periods of total war demand, and the federal policies aimed at solving the

[101] Pollan, *The Omnivore's Dilemma*, 41.

problems of overproduction in agriculture resulting from total war had failed. The failure of these policies, such as President Roosevelt's Agricultural Adjustment Administration and President Eisenhower's Soil Bank Program, led to an acceptance of subsidized overproduction and a major transition in thought with immense social, economic, and environmental implications. Historian Shane Hamilton wrote, "During the Great Depression, agricultural experts had seen the farm problem as an issue of overproduction. But in a Cold War political culture focused on maintaining economic stability and growth without the use of "socialistic" methods of heavy-handed economic intervention, the problem seemed to be "underconsumption"- a product of inefficient marketing."[102] This transition led to governmental policies that favored maximizing production for the purposes of driving down prices in order to provide Americans with cheap, processed foods. These new approach displays the commitment to overproduction and output maximization. The heavy handed economic policies aimed at controlling output were largely thrown out, in favor of a new era of maximized food production and processing in the United States. The ideas of this new era were firmly structured in lessons learned from war production, that had proven that there was ample demand for American goods, that demand, however, must be cultivated and capitalized on. Furthermore, the ethos of modern food maximization sought to prove the capabilities of a prosperous American economy in the decades following WWII.

The most notable new use for corn was high fructose corn syrup. High fructose corn syrup was thrust into the spotlight in the 1970s, when food companies began using this new sweetener instead of sugar. Compared to corn, sugar was quite expensive, and government policy in the United States kept sugar around two to three times the average world price of sugar.[103]

[102] Hamilton, *Trucking Country*, 115.
[103] Gardner, *American Agriculture in the Twentieth Century*, 146.

Sugar was comparably expensive in the United States due to protective tariffs that made sugar's price high. While high fructose corn syrup has remained cheaper than sugar in the United States, corn is not intrinsically less expensive than sugar. The price differential is a direct result of overproduction and subsidization. According to the USDA *Economic Research Service*, the United States sugar program supports prices at a level higher than world prices, protecting domestic sugar producers from cheap (or priced outside of tariff legislation) foreign sugar, most notably from Mexico.[104] The roots of this policy are in the Agricultural and Food Act of 1981, and subsequent food programs have maintained the general approach to sugar policy that was outlined in this bill. Subsidized corn created a cheap raw material for sweetness, and high fructose corn syrup quickly replaced the sugar in thousands of sodas, processed foods, candies, and baked goods. Additionally, corn was used to develop food fillers, starches, inks, solvents, and even plastics. Another interesting facet of this corn overproduction is the vast increase in using corn as the caloric basis for animal feed. This use of corn feed on animals that did not evolve to eat a corn intensive diet, perhaps, is the best example of modern agriculture imposing rules of industry and capitalism on nature. But this topic will be discussed further in the following chapter. These new uses resulted from the abundance of cheap and available corn. Similarly, these new food, industrial, and fuel uses created more reasons for the government to expand corn subsidy programs and production, which they did mightily in the early 1970s under Secretary of Agriculture Earl Butz.

What made this explosion of industrial corn possible? What technologies and socio-economic trends facilitated corn's dominance in an agricultural sector struggling to earn profits

[104] USDA Economic Research Service, *Sugars & Sweeteners Policy*. http://www.ers.usda.gov/topics/crops/sugar-sweeteners/policy.aspx (Accessed March 30, 2014.) For more on the history of sugar, see Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York City: Penguin Books, 1986).

and maintain margins? Hybrid seeds revolutionized corn production in the late 1920s. Historian Bruce L. Gardner calls hybrid corn "the greatest success story" of technology in agriculture due to the huge gains in output made possible by these seeds.[105] Iowa, for example, with minute acreage in hybrid corn in 1930, fully embraced hybrid seed and had 90 percent of the state's corn acreage in hybrid corn.[106] Henry A. Wallace, later Secretary of Agriculture for President Roosevelt's administration, sold the first hybrid corn seeds in 1926. These hybrid seeds were exemplary- they lead to increased yields, heartier crops that held up better in mechanical harvesting, and less waste. Unfortunately, these seeds were created to be good for only one planting season, meaning a farmer could not reuse seed year after year, which had previously been common practice. But in a decade of poor prices and low profits, farmers were desperate to maximize output to increase their incomes. Farmers returned to venders every year to purchase hybrid seeds, which were soon patented by these seed companies. This development resulted in farmers' dependency on seed companies for their economic survival. By the end of WWII, the overwhelming majority of the corn grown in America was grown from hybrid seed.[107]

The higher yields and efficiency of hybrid seed was further effected by the development of synthetic fertilizers. These fertilizers greatly improved output and furthered an agricultural sector that was already producing at a ferocious rate. Higher productivity led to more expensive and capital intensive inputs for farming. High-cost agriculture naturally led to a consolidation of American farming, a reshaping of the structure of agriculture, and a large majority of farmers leaving their land to the highest, or biggest bidder. In the rapid evolution of mid century agriculture in America, Jefferson's ideal of a democratic agrarian food sector was overtaken by fewer and much larger farming operations. In an article in *The Annual Review of Sociology*, titled

[105] Gardner, *American Agriculture in the Twentieth Century*, 19.
[106] Ibid., 19.
[107] Danbom, *Born in the Country*, 236.

"The Great Agricultural Transition: Crisis, Change, and Social Consequences of Twentieth Century US Farming" sociologists Linda Lobao and Katherine Meyer delve into this massive consolidation of agricultural production. The authors wrote that the years following WWII "ushered in the most rapid transformation, brought about by New Deal interventions and diffusion of new technologies. From 1940 to 1980, the farm population declined ten-fold, the number of farms declined by more than half, average acreage more than doubled, and real average sales increased six-fold."[108] Farm consolidation furthered overproduction of corn in America by imposing large scale industrial and capitalist ethics on nature. What follows will be a chronological attempt at understanding corn production in the United States. This overproduction, made possible by high demand in times of war and government price supports in times of peace, has come to be a defining characteristic of corn and its many controversial uses.

American agriculture in 2013 produced an obscene amount of corn. Just over 95 million acres were planted with corn this past year, and farmers averaged nearly 159 bushels of corn per acre planted. The result of this past year's harvest was over 13.9 billion bushels of corn.[109] This is the highest amount of corn production in American history. Despite vast overproduction, corn output has been on a steady incline in terms of total bushels produced per year, and bushels produced per acre since the end of WWII. Total acres planted has declined due to the improved crop and chemical technologies and mechanization that have been previously referenced. How has this happened? How can corn be exponentially overproduced, yet there still be enough of a market to provide stable prices and decent livelihoods to the corporate growers that grow the majority of American corn. The answer to this question lies in total war, and the impact that

[108] Linda Lobao and Katherine Meyer. "The Great Agricultural Transition: Crisis, Change, and Social Consequences of Twentieth Century US Farming." (*The Annual Review of Sociology*, Vol. 27, 2001), 107-109.

[109] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc (Accessed February 12, 2014.)

WWI and WWII economic booms in agriculture had on corn production. On an economic level, government subsidies and price guarantees facilitated overproduction in the post war years when farmers continually overproduced. On a practical and environmental level, genetic and chemical technologies developed by wartime defense corporations provided the necessary capabilities for maximization. One example of the wartime industry's later dominance of agricultural technology is agribusiness giant Monsanto's involvement in uranium research for the Manhattan Project. After the war they began developing DDT, Lasso, and a well known chemical called Agent Orange for agricultural purposes.[110] Total war has had an undeniable impact on corn production in America, and the environmental impact that these two wars have had on corn is best understood through studying its overproduction.

Part I: Corn Production During WWI, Postwar Overproduction, and the Road to WWII

World War I demanded increased production from farmers on a variety of staple crops for European aid. 1900 to 1920 were years of rare stability and prosperity for American farmers, and future generations would refer back to this time as the "golden age" of agriculture. World War I opened up a large and expansive new market for American producers, and the government pushed farmers to increase production to aid European countries even prior to American involvement in the conflict. Herbert Hoover, head of the United States Food Administration, used an effective propaganda campaign, using phrases like "food will win the war" to push output increases.[111] Despite vigorous pressure to drastically increase output, farmers failed to drastically enhance their output. For the duration of the war, corn production hovered around 2.5 billion bushels per year, with the peak year of WWI being in 1917 at just under 3 billion bushels.

[110] Marie-Monique Robin, *The World According to Monsanto: Pollution, Corruption, and the Control of Our Food Supply* (New York: The New Press, 2012), 39.

[111] Danbom, *Born in the Country*, 176.

Acreage of corn increased, but due to the fact that hybrid seeds and synthetic fertilizers had not yet revolutionized efficiency, bushels per acre during the war increased only moderately, from 22.7 bushels per acre in 1913 to 29.9 bushels per acre shortly following the war in 1920.[112] Some agricultural historians and economists have asserted that this high level of output in terms of bushels per acre was largely due to favorable weather.[113] Corn production in America had been relatively static for decades, and it appeared that production limits had been generally reached.

The government highly incentivized the already higher prices for corn and other crops, and farmers attempted to increase their operational capabilities. Farmers bought more land and invested in transportation with money from war demand. This development turned out to be catastrophic when demand dissolved shortly after the Treaty of Versailles. Farmers continued to produce as much as possible in order to maintain their elevated wartime economic status. In a speech to a Rusk County farm union on January 8th, 1920 in Fort Worth, Texas, union leader D. E. Lyday painted a grim picture for Texas farmers of the future of agriculture. Lyday attempted to make farmers aware of the "grave problems which have arisen as an aftermath of the greatest war in the world's history."[114] The majority of farmers saw prosperity as a benefit of America's new position of international economic and military superpower. There was overwhelming hope and optimism about a prosperous future in American farming, and farmers continued in their attempt to maximize production, believing that this period of time was different, and prosperity would continue.[115] This continued practice of maximization and exhaustion throughout the 1920s severely depleted soils of minerals vital to their survival and transformed protective grass and

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[112] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

[113] Glenn L. Johnson, *The Overproduction Trap in U.S. Agriculture: A Study of Resource Allocation from World War I to the Late 1960s* (Baltimore: The Johns Hopkins University Press, 1972), 72.

[114] Lyday, D. E., and A. L. Baker. "Speech of D. E. Lyday Before Rusk County Union, January 8, 1920," (*Farmers' Union Messenger*, January 15, 1920).

[115] Danbom, *Born in the Country*, 185.

woodlands into open fields for crops. As the use of hybrid seeds and synthetic fertilizers increased in the 1920s and 30s, production rose despite the lack of war demand.

Output increases were much more intense during WWII than WWI. The index of agricultural output in 1917-20 averaged 6.5 percent greater than in 1910-14.[116] Despite American farmers inability to greatly increase production for WWI, the war instilled an economic ethic of overproduction and output maximization. This is evident in the way that farmers continually maximized output in the years following WWI, despite government advice and programs aimed at curtailing surplus. One major consequence of this assumption that wartime prosperity could be sustained through an exhaustive approach to agriculture is the Dust Bowl, an ecological disaster that devastated the country's heartland. According to farmer Lawrence Svobida in his personal history of farming during the Dust Bowl, winds wreaked havoc "from the Canadian line to central west Texas, covering the entire western areas of Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, with extensive portions of Montana Wyoming, Colorado, and New Mexico."[117] Farmers firmly in the grasp of the Great Depression continually increased output despite historically low prices, at abysmally low income levels due to the farmers' own overproduction. In the two decades following WWI, American corn production stayed at least at wartime levels, despite a few down years due to poor weather. In 1918 American farmers produced 2,441,249,000 bushels of corn, at an average of 23.9 bushels per acre. The following year, still intensely involved in total war, corn output was at 2,341,870,000 bushels, averaging 26.8 bushels per acre. Following the war, for example, 1923, corn increased to 2,429,5510,000 bushels, averaging 27.8 bushels per acre. In 1932, production increased again to 2,578,685,000

[116] Johnson, *The Overproduction Trap in U.S. Agriculture*, 72.

[117] Lawrence Svobida, *Farming the Dust Bowl: A First-Hand Account from Kansas* (Lawrence: The University Press of Kansas, 1986), 35.

bushels, at an average of 26.5 bushels per acre.[118] Farmers' continued to produce close to war time levels, hoping for the economic benefits of wartime demand.

The years following WWI were especially hard for American farmers, so harshly removed from the "golden age" of agricultural prosperity. Prices received by farmers for their output decreased by more than 40 percent from 1919 to 1922, causing severe difficulty in repaying debts incurred in expansion for total war.[119] American farming in the years following WWI revealed a "propensity to overproduce" despite the lack of federal price supports, and despite the fact that continued overproduction led to continued price depression.[120] Along with overproduction came an over commitment of resources, such as land, labor, capital, fuel, and other environmental inputs necessary in agriculture. Instead of poor prices and overproduction leading to a redistribution of resources that were obviously over used in agriculture, resource usage expanded in agriculture, unsuccessfully trying to force the agricultural market into prosperity. Events as serious as the agricultural depression, the Great Depression, and the Dust Bowl could not remove from agriculture an abundance of resources and energy that had been overcommitted to agriculture during years of expectations of continued prosperity.[121] The resource overages in agriculture had profound social, economic, and environmental impacts on the United States in between the World Wars, and diverted resources that could have been used in countless other sectors of American society throughout the 1920s and 30s.

The Agricultural Adjustment Administration, which I have discussed in the previous chapter, went to great lengths to solve this crisis of agricultural overproduction throughout the 1920s and 30s. Corn was not one of the initial crops with price protection in the AAA inaugural

[118] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

[119] Johnson, *The Overproduction Trap in U.S. Agriculture*, 160.

[120] Ibid., 161.

[121] Ibid., 71.

year of 1933, but corn along with tobacco was added to wheat, cotton, and pork, (the initial crops) in 1934.[122] The AAA attempted to stymie overproduction using acreage allotments, paying rent directly to farmers for the land that they retired from their production.

One major problem of this program was that it began cutting acres out of production precisely when hybrid seeds and synthetic fertilizers began increasing yields per acre. So farmers could remove land from production, receive bonus income from the government, and still bring roughly the same amount of output to the market. When overproduction persisted, a government organization also created by FDR in 1933 called the Commodity Credit Corporation, bought up and stored surplus at predetermined prices that were set higher than market prices, which were driven drastically low due to overproduction. To emphasize the AAA's failure in cutting overproduction of corn, in 1933, the first year of AAA operation, American farmers planted just under 110 million acres in corn, and received an average yield of 22.8 bushels per acre. For comparison, in 1940, prior to the second stage of total war demand, farmers decreased acres planted in corn to just under 89 million, a substantial decrease of around 21 million acres. This cut in acreage is due to the AAA's policy of paying rent to farmers who removed land from their farms. However, yield in bushels per acre skyrocketed from 1933 to 1940, from 22.8 bu/acre to 28.9 bu/acre.[123] Any real successes in cutting overproduction by limiting acres planted was undone by technological innovations that resulted in drastic increases in terms of bushels per acre. Overproduction persisted at such an immense rate that by the end of 1941, on the eve of America's total involvement in WWII, the Commodity Credit Corporation had purchased mountains of American corn to keep it off the market and prevent further price depression. Economist Glenn L. Johnson's study of overproduction in this period found that, "although less

[122] Conkin, *A Revolution Down on the Farm*, 63.

[123] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

acreage was planted, yields rose sufficiently to increase CCC holdings of corn to 403 million bushels at the end of 1941."[124] The AAA could not decrease, or even consistently maintain levels of production of American corn. Overproduction was an intrinsic part of agricultural production prior to WWII, and farmers and food processors sought to make up for poor prices (that they exacerbated with continued output maximization) with constantly producing at the ever expanding level of full capacity.

Agricultural Resurgence, WWII, and the Entrenchment of Corn Overproduction

Total war from 1914-1919 exposed American farmers to a new market in agriculture, and farmers spent the two decades that followed WWI revolutionizing agricultural efficiency and maximizing output hoping to rediscover that short period of prosperity. Prices responded with depression to agricultural overproduction, but another outbreak of total war, from 1939-1945, hid the terminal symptoms of systemic overproduction. The massive outbreak of total war in Europe led to unanticipated demand in American agriculture, which, according to economist Glenn L. Johnson, "allowed fuller use of resources recently overcommitted to agricultural production."[125] The AAA's acreage allotments and production limitations were quickly lifted, and CCC stocks of surplus output were used for aid to America's allies, even before American involvement. Agricultural reactions to WWII and the rebirth of globally driven total war demand was enhanced by capacity which accumulated during the two decades that preceded WWII, years that were at least somewhat kept in check by output restrictions and adverse weather of that era. Wartime policies of output increases replaced AAA restrictions with price and other sorts of

[124] Johnson, *The Overproduction Trap in U.S. Agriculture*, 75.
[125] Ibid., 165.

stimuli.[126] Historian David B. Danbom wrote, "production controls were suspended, but income supports were kept in place, even though the economic conditions that had originally justified them no longer operated."[127] High, government supported prices, combined with a lack of limitations, provided farmers with enormous motivation to expand production and help supply America's war effort. Agriculture responded to government incentives to increase production mightily.

Corn production during WWII rapidly expanded, as farmers had the capabilities to quickly utilize latent acres, previously in conservation, to grow hybrid seeds powered by widespread fertilizer use. Due to the fact that by the dawn of WWII the use of hybrid seeds and synthetic fertilizer was ubiquitous, farmers took great advantage of technological advancement, and unlike for WWI, were able to drastically increase corn production. In 1938, a relatively steady amount of 2,300,095,000 bushels of corn were produced, at around 27.8 bushels per acre. According to the USDA, bushels of corn per acre has been on a steadily increasing trajectory after WWI, but WWII sparked a new age of efficiency for corn production. By 1946, farmers produced 2,916,089,000 bushels of corn at a substantially greater efficiency rate, around 37.2 bushels per acre. Only a few years after, in 1948, American farmers were producing an average of 43 bushels of corn per acre.[128]

To make this expansion even more impressive, many American farms were operating with less available labor, as millions of young men were sent to war in Europe and in the Pacific. Glenn L. Johnson's study states, "the decrease in farm population was nearly six times greater than the estimated reduction in the labor force during the same interval. The difference was

[126] Johnson, *The Overproduction Trap in U.S. Agriculture*, 71.
[127] Danbom, *Born in the Country*, 231.
[128] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

probably due, to some extent, to many rural women and children joining the labor force in response to patriotic appeals as men left for war."[129] The exodus of women from the home to the factory is a well documented social impact of WWII, but the loss of labor on farms in America, farms that had already been through massive declines in terms of population percentage, further illustrates the importance of increased production efficiency in agriculture in terms of output per capita.

Americans faced food shortages on certain products during WWII, most notably animal products. In Amy Bentley's *Eating for Victory: Food Rationing and the Politics of Domesticity*, she states, "Preventing waste, avoiding black markets, producing food, and abiding by food rationing, however trivial they may have seemed, allowed Americans to contribute to, and feel a part of, the war effort in daily physical and communally oriented ways."[130] Such an incredible amount of agricultural output was used as a part of the American war machine, that families heavily and actively participated in government sponsored rationing programs. Agriculture performed so admirably, however, that the majority of Americans made it through WWII with only minor nutritional inconveniences. In a 1945 quarterly report to the Office of the President and both houses of Congress, James F. Burns, the Director of War Mobilization and Reconversion provided members of the executive and legislative branches with a cogent explanation of agriculture's role in domestic and international survival during WWII. He wrote, "In general, the United States has eaten well during the war. That is largely because of the magnificent performance of American agriculture. Food output rose to one new high record after another, and, in 1944, was 38 percent above the prewar average (1935-39); and as overall production increased, farmers shifted from a peacetime to wartime pattern so as to produce the

[129] Johnson, *The Overproduction Trap in U.S. Agriculture*, 166.

[130] Amy Bentley, *Eating for Victory: Food Rationing and the Politics of Domesticity* (Champaign, IL: The University of Illinois Press, 1998), 4.

foods most needed. This high volume of production was traceable to some increase in acreage, sharply expanded use of commercial fertilizer, increased mechanization of farm operations, and more intensive cultivation."[131] Burns' comments detail the capabilities present in American agriculture during WWII that enabled unprecedented levels of food aid to be sent overseas, while Americans were able to maintain a comfortable level of food consumption. Following the war, this level of food consumption would come to expand and include a great majority of the increased output for war that was no longer sent overseas. Instead of reverting back to pre-war levels of production and consumption, American agriculture realized a new level of output maximization and overproduction, one that was not relinquished during peacetime.

The price depression in agriculture that followed WWII was delayed due to a continuation of federally supported high prices through 1949, and a minor demand boom for the Korean War. By the early to mid 1950s, however, prices began returning to their real levels, as total war demand faded and poor prices took root again. Agricultural historian Paul K. Conkin wrote, "By 1954, the years of high demand relative to production were over, and from that time to about 2005 (with the exception of the mid- 1970s), farm production outran demand, and problems of surpluses and support prices remained at the center of agriculture policy making."[132] Overproduction of corn in the years following WWII transcended other staple crops, creating a seemingly endless supply of artificially priced corn.

President Truman was commissioned with the difficult task of reconversion in agriculture after WWII. This was a daunting task, especially when considering the failure of reconversion in American agriculture following WWI. Luckily for Truman, a booming post war national economy and the fortunate position as economic superpower ameliorated economic worries

[131] James F. Burns, The Department of War Mobilization and Reconversion, *Quarterly Report, July 1945* (Washington: U.S. Government Printing Office, 1945.), 41.

[132] Conkin, *A Revolution Down on the Farm*, 81.

following WWII. Federally supported prices remained high following the war, in an attempt to avoid price crashes like the early 1920s. These price supports lasted the duration of Truman's term, and remained in place until the beginning of President Eisenhower's term in 1954.[133]

Truman attempted to assist agricultural reconversion by adopting acreage allotments following the war. The Marshall Plan alleviated economic symptoms of overproduction following the war, allowing excess output to be sent abroad for war recovery aid. As other countries began stabilizing their own production capabilities, the Commodity Credit Corporation was once again needed to purchase surplus corn production by 1949. Another minor band aid for overproduction was provided in the form of American military involvement in Korea. Truman employed acreage controls to decrease production and begin the troubling process of reconversion, but this failed to slow the rate of growth in domestic production. Agriculture's continued revolution in efficiency had completely overwhelmed Truman's hopes at reconversion and output control. By 1954, The CCC had purchased and accumulated 920 million bushels of surplus corn.[134] In 1941, in comparison, after over two decades of overproduction following WWI, the CCC only had stocked 403 million bushels of excess corn. Compared to WWI, American agriculture in the years following WWII had more than doubled corn overproduction (in terms of government purchased surpluses) in less than half the years. This remarkably rapid filling of government coffers occurred despite massive exports during the Marshall Plan years, expanded markets during the Korean War, and feeble government attempts at reconversion and production control.

Comparison of CCC stocks following WWI and WWII reveals two major realities of total war and agriculture: Firstly, production controls and acreage allotments could not stymie

[133] Conkin, *A Revolution Down on the Farm*, 80.
[134] Johnson, *The Overproduction Trap in U.S. Agriculture*, 168.

the explosion in efficiency in corn production. Corn is America's leading agricultural product, and its output has increased from just over 2.5 billion bushels in 1914 to 13.9 billion bushels in 2013. Furthermore, output efficiency in terms of bushels of corn per acre has increased from 25.8 bu/acre in 1914 to 158.8 bu/acre in 2013.[135] Acres planted in corn has remained relatively constant throughout this entire time period, yet production controls and acreage allotments have obviously failed at restraining surplus. Secondly, supported prices, although aimed at keeping prices away from depression, gave farmers more incentive to overproduce. Due to the stability of subsidized corn prices, continually expanding overproduction of corn can be viewed by the individual farmer as economically logical. If overproduction had a negative impact on prices, over time, farmers would undoubtedly adjust their operations towards other crops, or other, more sustainable ways of producing crops. Instead, government price supports shifted a large part of the economic and social burdens of overproduction away from the farmers, practically encouraging further expansions in production.[136] The explosion in government-held stocks of corn in periods following total war, alleviated and blurred the true consequences of corn production during this period. Government assistance to farmers during these periods, while aimed at maintaining some standard of living for farmers and avoiding agricultural depressions, furthered overproduction by removing consequence. From the viewpoint of an average farmer or food processor, the federal government's purchases of overproduced output to build stocks became an additional source of demand.[137] Subsidized corn continues to give farmers short run economic viability in an economic landscape that forecasts doom and gloom in the long run for modern agriculture. Corn has continued to expand because artificially priced, cheap corn is

[135] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

[136] Johnson, *The Overproduction Trap in U.S. Agriculture*, 169.

[137] Johnson, *The Overproduction Trap in U.S. Agriculture*, 74.

beneficial to the modern food system- a system that uses corn as a raw material to create value added foods, animal feed, and fuel- not as food itself.

Enhanced labor productivity, and increases in the use of fertilizers and pesticides accelerated corn production in the late 1940s through the 1950s, enabling yields just under 4 billion total bushels of corn, at an average of 53.1 bu/acre by 1959.[138] That is an additional 20 bushels of corn per acre planted in just 14 years, since the close of major conflict in Europe during WWII. Labor productivity resulting from technological innovation reveals the rapid industrialization process that occurred in American agriculture. In an article by economists Barbara J. Craig and Phillip G. Pardey, called "Productivity Measurement in the Presence of Quality Change," the authors state that "Between 1949 and 1991, labor productivity in American agriculture (per worker) increased by 400 percent."[139] As efficiency transformed rural America, the drastic loss of labor on American farms was astounding. Farm labor was greatly redistributed, especially following WWII, to other sectors of the booming post war economy. Another article by agricultural historians Robert and Don Paarlberg found that, "the share of the U. S. labor force employed on farms fell from 25 percent in the 1930s to less than 2 percent by the 1990s."[140] This loss of labor resulted, not only in a need for productivity in terms of output per capita, but more importantly consolidated American farms, leading to fewer, industrial style large farms. Since 1950, labor productivity in industry outside of agriculture has increased 2.5 fold, and labor productivity in agriculture has increased 7-fold. From 1950 to 1970, the labor

[138] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

[139] Barbara J. Craig and Phillip G. Pardey, "Productivity Measurement in the Presence of Quality Change" (*American Journal of Agricultural Economics, Vol. 78, No. 5, Dec. 1996*), 1349-1354.

[140] Robert Paarlberg and Don Paarlberg, "Agricultural Policy in the Twentieth Century" (*Agricultural History, Vol. 74, No. 2, Spring, 2000*), 137.

pool in agriculture dropped by around 50 percent, yet the value of total output increased by around 40 percent.[141] Historian Paul K. Conkin elaborates on agricultural labor statistics, stating,

> Even these numbers understate the pace of change. With each passing year, the output of small farmers (most with off-farm employment), who constituted more than half the 2.9 million farmers in 1970, produced an ever smaller proportion of the total output. This trend continued, so that by 2002, only 322,625 farms produced 89 percent of all output.[142]

Regarding corn in particular, increasing labor productivity resulted in unbelievable reductions in labor hours per bushel. In twentieth century American corn production, the number of hours per 100 bushels shrank from 147 hours of human labor in 1900 to 16 in 1950 and to 3 in 1990.[143]

Labor productivity cannot alone explain corn's ascension to dominance of the postwar market of agricultural overproduction. David Garst, Vice President of Garst Seed Company, in a speech in 1990 on increased efficiency in corn production, stated that, "Approximately half of that increase is a result of hybrid seed. The other half is attributable to all of the other inputs in agriculture- machinery, fertilizer, insecticides, herbicides, irrigation, etc."[144] The widespread use of synthetic fertilizers, insecticides, and herbicides in corn production was a direct result of total war, as munitions and armament companies underwent their own "reconversion" process from wartime suppliers to peacetime researchers. Garst continued to discuss the growth in fertilizer use following WWII, saying, "nitrogen production between 1950 and 1955 rose from 1,000,000 tons to 5,000,000 tons and went up to 10,000,000 tons by 1960. It has remained relatively high ever since."[145] A study on resource allocation in agriculture suggests that much more fertilizer was used, stating "Between 1957 and 1962, fertilizer usage increased from 21.6 to 27.4 million

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[141]Conkin, *A Revolution Down on the Farm*, 98.
[142] Ibid.
[143] Ibid.
[144] David Garst, "What Farmers Want" (*Agricultural History, Vol. 64, No. 2, Spring 1990*), 319.
[145] Ibid., 321.

tons (over 25 percent)."[146] Synthetic fertilizer allowed farmers to focus production on single crops instead of diversifying production to maintain nutrient levels in their soils. Fertilizers replaced nutrients with synthetic compounds, allowing farmers to use the same fields for one single crop, such as corn, every single season. Farmers were able to more than double production from 1917 to 1968, on roughly the same acreage of land, with only around one-third of the amount of labor. Corn production from 1968 to 2013 has more than tripled, on about the same acreage. This was due largely to the magnitude of increased use of land substitutes, such as fertilizer, in American agriculture.[147]

Other land substitutes, or capital inputs besides land expansion that increase agricultural production, that have drastically exacerbated American corn's overproduction are pesticides and herbicides. According to historian Bruce L. Gardner, U. S. farm usage of chemical pesticides and herbicides "became massive after World War II." Gardner continued,

> The insecticides DDT and later malathion and the broad-leaf herbicide 2,4-D, a synthetic organic herbicide developed in the 1940s (and ancestor of the Agent Orange used by the U. S. armed forces as a defoliant in Vietnam) became popular in the 1950s. Pesticide use increased tenfold between 1945 and 1972. In 1952, 11 percent of corn and 5 percent of cotton acres were treated with herbicides; by 1982 these percentages had risen to 95 and 93 percent, respectively.[148]

High corn yields, which are vital to the modern food system, could not exist in environments without chemical fertilizers, herbicides, and pesticides. These scientific developments are examples of agriculture's attempts at controlling nature, keeping the non-human world in its place (as subject to humanity's needs and desires.) The modern food system, and corn production in particular, has been modeled on the assumption that humanity is superior to nature, and humanity has the right to impose, extract, and exhaust. This assumption is evident in agricultural

[146] Johnson, *The Overproduction Trap in U.S. Agriculture*, 142.
[147] Ibid., 87.
[148] Gardner, *American Agriculture in the Twentieth Century*, 24.

overproduction during these periods of total war, and in these scientific developments that facilitated overproduction. This assumption also sets humans in a place of opposition to nature in many ways. Rather than seeing humanity as a part of delicate ecologies, modern agriculture has played a great role in furthering the separation between human bodies from the non human world, or, the source of human's food calories. As massive social, political, cultural, and economic revolutions changed America in the years following WWII, science in agriculture transformed food production in ways that alienated consumer from source, in many ways removing consumers' dependence on the source. This enables the adoption of maximization technologies to become mainstream, making unsustainable practices in modern agriculture seem vital to human survival. Eating is symbolic of an ecological relationship, and the culture around eating in modern America symbolizes an ecology shockingly in crisis. Modern food obscures the relationship between human and nonhuman that is eating. Michael Pollan suggests that "how and what we eat determines to a great extent the use we make of the world- and what is to become of it."[149] In modern agriculture, I would argue that what farmers, agribusiness, and policy makers make of the world and nature determines a large amount of what consumers eat. As long as these groups continue to see the earth's soils, bodies of water, and other natural resources strictly as means to a profit, than agriculture will continue along this harmful and unsustainable trajectory.

The mid to late 1950s in America impacted this relationship in profound ways, especially in regards to American corn, as federal policies and private capitalism combined to bring a new order in food production. Corn production during President Eisenhower's administration underwent a sweeping evolution. Following the Korean War, as overseas demand quickly

[149] Pollan, *The Omnivore's Dilemma*, 11.

desiccated, prices in agriculture went into a long and lasting decline.[150] Eisenhower's plan for agriculture initially followed in the footsteps of FDR and Truman, hoping to cut overproduction by acreage reductions, despite rapidly increasing yields per acre of corn. This attempt was widely known as the Soil Bank Program, passed as the Agricultural Act of 1956. As discussed in the previous chapter, the Soil Bank Program and the Conservation Reserve Program failed to successfully control the explosion of overproduction that occurred in agriculture following the war. The failures of the Soil Bank closely resemble the failures of the AAA and reconversion attempts under Truman. In both cases, total war exposed farmers to exciting new expectations of price and output levels, levels that were not sustainable in a domestic market. The periods of hardship that followed WWI and WWII in agriculture resulted in similar government attempts to solve these farm problems. After the failure of the Soil Bank, according to agricultural historians Robert and Don Paarlberg, President Eisenhower decided to move away from "expensive half-measures such as export subsidies (often disguised as "food aid") or massive land set asides" which had failed to control output and cost billions of dollars.[151] Eisenhower and Secretary of Agriculture Ezra Taft Benson began fundamentally changing the focus of public policy towards overproduction, expanding subsidies for overproduced corn, championing efficiency, scientific innovation, large- scale industrial agriculture, and output maximization,

In an annual budget speech to congress delivered in January of 1958, two years into the struggling Soil Bank Program, President Eisenhower provided the framework for a drastic reconfiguration of modern agriculture. He summarized the recent decades of farm policy by saying,

[150] Refer to Robert Paarlberg and Don Paarlberg, "Agricultural Policy in the Twentieth Century" (*Agricultural History, Vol. 74, No. 2, Spring, 2000*), 145.

[151] Ibid.

> Our system of price supports has tended to price key farm commodities as if they were scarce, stimulating continued production in excess of the quantities that existing markets can take at these prices. Controls have not been effective in reducing overall agricultural production, despite the severe restrictions they impose on farmers' freedom to produce and market. As a result, the Government has become the market for huge quantities of agricultural commodities, and our surplus disposal operations have been greatly expanded both at home and abroad. A technological explosion is occurring on American farms as can be seen from the fact that production per farm worker has doubled in the last 15 years. A new dimension in farm policy has been created which makes it virtually impossible to curtail agricultural output with the type of controls acceptable in our society. Under these circumstances, farm products are likely to continue to be abundant, and we cannot successfully continue with obsolete legal formulas governing acreage allotments and price supports.[152]

Despite Eisenhower's stark opposition to communism, and Secretary Benson's view of price supports as a symbol of socialism, subsidies continued throughout the remainder of the 20th century, and continue today. The administration aimed at removing as much government intervention in agriculture as possible, to avoid the stigmas of socialism in vehemently charged era of political discourse of capitalism and communism. According to historian Shane Hamilton, the Eisenhower administration opposed the soft New Deal approach to agriculture (despite their strikingly similar initial solution). Hamilton wrote, "Under Ezra Taft Benson, the Department of Agriculture's efforts to solve the farm problem would shift away from planned scarcity (acreage allotments, artificially high prices) toward full-fledged efforts to boost the marketing power of food processors and factory farmers."[153] This suggests that the new approach would be demand oriented, as opposed to controlling the supply. In other words, industry and government planned to seek creative new ways to increase or create demand for food or agricultural output, viewing cheap caloric inputs as necessary parts of a demand oriented approach.

From 1953 to 1961, Eisenhower and Benson's term in office, corn production in America flourished. Average yields in terms of bushels of corn per acre increased from 40.7 in 1953 to

[152] Public Papers of the Presidents: Dwight D. Eisenhower, 1958 (Washington: U.S. Government Printing Office, 1959), 63-64.

[153] Hamilton, *Trucking Country*, 111.

62.4 in 1961.[154] Another damning example of the rampant corn overproduction during this administration is the growth of CCC stocks of corn. Farmers continued to maximize output of corn, knowing their excess corn would be bought by the CCC at high prices. By 1961, at the end of the Eisenhower/Benson administration, government-owned corn stocks were more than twice the 1953 level.[155] The Conservation Reserve Program remained intact throughout the following decades, but this did nothing to curb corn production.

Following the Eisenhower administration, efficiency and technology in agriculture were championed at the expense of economic and environmental concerns. In a political age in America that feared the evils of totalitarianism, this administration aimed to move the responsibly of monitoring agriculture from the public to the private sector. Benson advocated marketing, science in agriculture, and corporate control of the American food supply. In his autobiography, *Cross Fire: The Eight Years With Eisenhower*, Benson defended the administration's position in agriculture. He lamented the failure to totally remove governmental intervention in agriculture, and wished stronger legislation in agriculture could have been attained. He said, "We had to take what we could get. We had to make a beginning somewhere. We had to start at least to reverse the 20-year trend towards socialism in agriculture."[156] One of Benson's primary goals was to enlarge domestic consumption by developing new marketing techniques and value added foods.[157] The years that followed the Eisenhower and Benson regime would see drastic changes in the realms of convenience foods, value added foods, fast food and dining out, and food science- fueled by industrial inputs such as cheap, subsidized corn. If

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[154] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

[155] Paarlberg, "Agricultural Policy in the Twentieth Century", 150.

[156] Ezra Taft Benson, *Cross Fire: The Eight Years with Eisenhower* (White Fish, Montana: Literary Licensing, LLC, 2011), 254-255.

[157] Refer to Edward L. Schapsmeier and Frederick H. Schapsmeier, "Eisenhower and Ezra Taft Benson: Farm Policy in the 1950s" (*Agricultural History, Vol. 44, No. 4, Oct. 1970*), 374.

Benson saw overproduction as a problem of insufficient demand, the modern food system in America's focus on value added foods and marketing must have seemed like the ideal solution for overproduction.

Fueled by continued subsidies, corn production continued to expand at record breaking levels. A 1970 study of resource allocation in agriculture by economist George L. Johnson suggested, in regards to solving problems of overproduction and over commitment of resources in agriculture, that "price manipulation and production control should not be expected to be an effective sole means of accomplishing such ends."[158] Considering the failures of the AAA and the Soil Bank, this claim seems to be historically sound. The study continued to say, "Nor should we expect to do the job with demand- expansion schemes for food." [159] With respect to Benson's goal of expanding demand for food, this claim provides an interesting way to view corn production into the present. Has the domination of processed foods, high fructose corn syrup, corn starches and fillers, and the ever-expanding use of corn alcohol (ethanol) as fuel drastically altered corn overproduction? Have these "demand-expansion" schemes reduced overproduction? The statistics, according to the USDA, suggest that the opposite has happened. Demand expansion combined with subsidized prices has resulted in increased overproduction of corn, a result which has greatly benefited large scale corporate farming and processed food companies. Following administrations continued to see remarkable increases in corn output and continued to subsidize overproduction.

[158]Johnson, *The Overproduction Trap in U.S. Agriculture*, 183.
[159] Ibid.

Modern Corn and Human Consumption

In 1969, in the early stages of a brief demand boom in agriculture during the Nixon Presidency, corn production had reached yields of over 80 bushels per acre. A decade later, yields averaged 109.5 bushels an acre. By 1989, average yield in terms of bushels per acre was around 116.3. At this point, total yield of corn had nearly doubled in twenty years, from just over 4 billion bushels in 1969 to just under 8 billion bushels of corn in 1989. 1999 saw a total yield of almost 9.5 million bushels, averaging 133.8 bushels per acre, and in 2009 farmers produced over 13 billion bushels of corn, at a staggering 164.7 bushels of corn per acre.[160]

Modern corn statistics reflect the immense power of total war, technological innovation, social evolution, and government intervention. Corn's exponential rise can be attributed to this combination of human factors, but overproduction of corn cannot be completely understood outside of the nonhuman environment in which corn has been chemically, synthetically, technologically, and genetically adapted to thrive. Modern corn thrives due to a cycle of soil manipulation and environmental contamination. Monoculture crops deplete soils of the nutrients a specific plant needs to grow. Chemical fertilizer has allowed monoculture crops to survive where exhausted soils would not have naturally sustained them. Variety in agriculture also naturally lessens the impact of insects, but massive industrial farms that grow only a couple varieties of crops on thousands of acres keep insects at bay with the generous use of insecticides and pesticides, sprays that runoff into water sources, pollute soils, and affect the human body.[161] The history of American corn in this period is not a human history separate from the nonhuman world. It is a history of a relationship between human and nonhuman, and, specifically in the

[160] USDA, *National Agricultural Statistical Service*, Corn Acres Planted, Corn Bushels per Acre. http://quickstats.nass.usda.gov/results/B9ABD206-4BCF-3969-AAF0-8561EBC44F9A?pivot=short_desc

[161] See Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin Company, Anniversary Edition, 2002) and Arturo Warman, *Corn and Capitalism: How a Botanical Bastard Grew to Global Dominance* (Chapel Hill: The University of North Carolina Press, 2007), 151-173.

case of total war and corn, a relationship that is far from a state of equilibrium. These interactions demonstrate the role of nature in human history, with nature always complicating human attempts to conquer it.

How has this overproduction stemming from total war affected modern food? How has the modern industrial food system decided to deal with this abundance? As the price of corn has maintained its very low level due to overproduction, processed food companies have gained an inexpensive input with which to increase profits of food products. Predictably, as corn prices remained low and new uses were developed for corn, processed food production, marketing, and availability has proliferated. Consider the following graph, provided by the USDA. It displays how much corn is produced, and in what ways is it consumed.

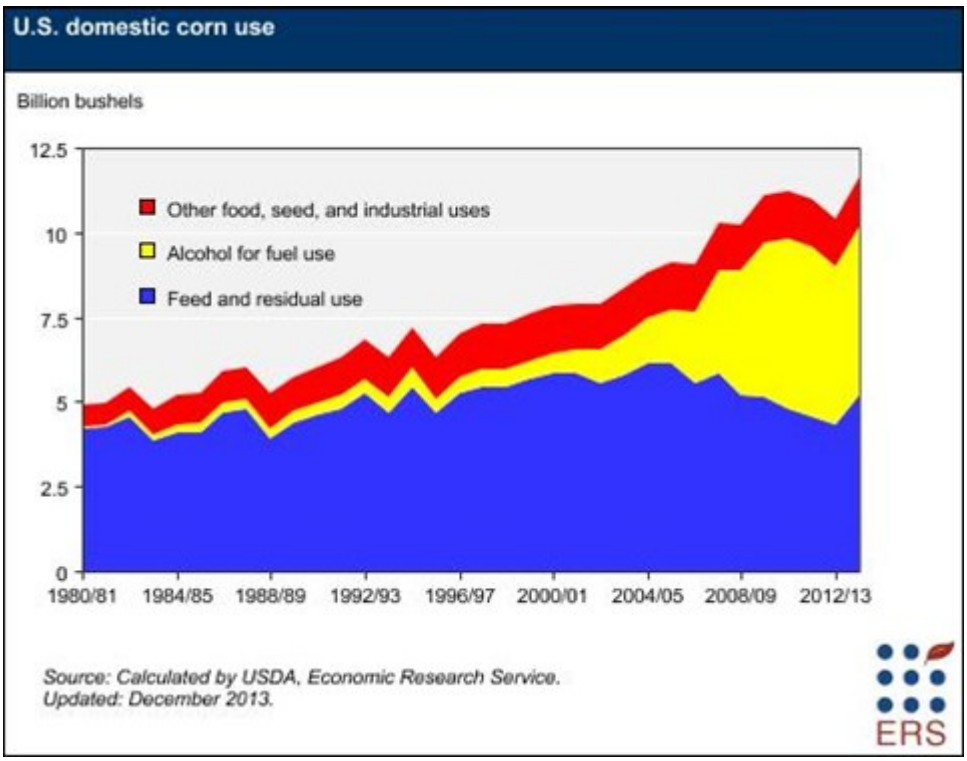

Figure 1. Categorized domestic usage of corn in America.

The graph in Figure 1[162] shows tremendous growth, but not in terms of human consumption of corn in its ordinary state for nutritional calories. In fact, the red section appears to be relatively constant throughout the two decade span represented here. The large majority of corn production in America is for animal feed. Corn is used as an inexpensive way to fatten cattle, chickens, and pigs, providing the consumer with relatively cheap meat. This section of the graph also represents the greatest and most pervasive way that corn has entered American bodies throughout this past century of corn overproduction. The yellow section is growing rapidly, displaying current aims at minimizing dependence on foreign oil, replacing whatever percentage possible with bio fuels. The alchemy of transforming cheap corn into expensive fuel became more cost-effective for producers and was boosted by industrial subsidies and increased the demand for corn significantly.[163] Historian Bruce L. Gardner stated that corn subsidies for ethanol fuel have been "successful in expanding corn use in ethanol from a small niche to a billion-dollar market."[164] Food science takes up an overwhelming majority of the red section of corn usage in America. Michael Pollan wrote, "What doesn't pass through the gut of a food animal to become meat will pass through one of America's twenty-five "wet mills" on its way to becoming one of the innumerable products food science has figured out how to tease from a kernel of corn."[165] While the amount of actual corn eaten has not drastically increased with this overproduction, corn intake has skyrocketed by its transformation into other caloric sources for human consumption.

Subsidies have made the overproduction of corn economically viable since years following WWI. In recent years, corn has become the leading recipient of subsidies in America,

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[162] USDA Economic Research Service, *U.S. Domestic Corn Use*. http://www.ers.usda.gov/topics/crops/corn/background.aspx (Accessed March 29, 2014).
[163] Gardner, *American Agriculture in the Twentieth Century*, 28.
[164] Ibid., 187.
[165] Pollan, *The Omnivore's Dilemma*, 85-86.

despite the fact that per capita consumption of actual corn has not drastically increased. According to the Environmental Working Group (EWG), who extrapolates and estimates subsidy information from the USDA's Census of Agriculture publications, from 1995-2012, corn has received over 84 billion dollars in government subsidies- far and away the largest amount during this period. This organization also shows how subsidies have influenced the corporate consolidation of American farmland, and how the agricultural market favors those who overproduce. According to the EWG, ten percent of American farms receive 75 percent of subsidy payments. The farms in this ten percent group are extraordinarily large, meaning that those farms with the greatest ability to overproduce, receive the most federal incentive to overproduce. The top 1 percent receive 25 percent of federal subsidy payments. Many corn farms have received millions of dollars in corn subsidies from 1995- 2012, such as Harvest States Cooperatives in St. Paul, MN and Walker Place in Danville, IL. These two farms have received $14.6 million and $11 million in corn subsidies, respectively.[166] Subsidized corn is an enormous economic boost to those farms and food processors that are in the agricultural "elite", and the data suggests that there is a desire to keep federal dollars flowing to the strongest corn producers.

The concentration of corn subsidy payments in recent years is just one of the many long term impacts of total war and corn production in America. These price supports are no longer paid to protect poverty stricken farmers in years of price depression. Subsidies have become a built in part of the profit motive, and this federal money favors large scale, corporate producers, that continually overproduce corn, necessitating the development of costly ways of consuming surpluses. Overproduction has transformed American agriculture. Originally a response to unprecedented macro demand during total war, overproduction is now systemic, and an entire

[166] Environmental Working Group. *Farm Subsidy Database 2013, Farm Payments, Corn.* http://farm.ewg.org/region.php?fips=00000 (Accessed February 11, 2014)

food economy has evolved around the assumption of overproduction. This crisis of corn overproduction is just one facet of an agricultural economy stricken with systemic overproduction at levels that cannot be sustained. The ethos of abundance that developed in this crucial time period in modern American history was vital to the creation of the modern food system, and the promises of postwar American prosperity have resulted in a false hope of unending expansion and economic success. This political economy and environmental history of the corn industry during this period provides a great glimpse into the foundation of the modern food industry. The following chapter will study meat consumption in America in response to total war, and will track the changes in meat production during this era. The overproduction of corn had a profound economic and environmental impact on meat production and consumption in America. We've seen the impact of total war on American corn, and the majority of the bodies eating up all of this overproduced corn are not human bodies, but the animals destined for human consumption. Beef output maximization, much like corn, reveals vital realities of the history of the entrenchment of policies of maximization and abundance in agriculture.

CHAPTER 4

MAXIMIZING MEAT: A STUDY OF THE GROWTH OF AMERICAN BEEF PRODUCTION

Beef consumption has historically symbolized American prosperity, and access to affordable beef had been ingrained as a basic economic right by the early years of the Cold War. Policies of output maximization across agriculture, especially in corn, has drastically impacted the beef industry, allowing costs to remain consistently low in the years following WWII. As incomes rose following the war, demand for beef proved to be directly proportional to income, and rose accordingly. During the mid 1970s, the rapidly rising demand for and production of beef remained relatively constant due to rising consumption of chicken and pork. Beef overproduction throughout this past century has created a modern food environment in which a seemingly endless supply of beef is available to American consumers through a variety of cheap and accessible means.

Beef markets fluctuated greatly, resulting in low prices in periods of overproduction and high prices in lean output years. Prices remained comparably low, however, due to efficiency, the development of the modern feedlot, improved transportation capabilities, and subsidized corn feed for beef cows. Beef producers were able to increase output at low costs, due to a myriad of factors. The ethos of abundance in beef production is cemented in these years, as prosperity in America resulted in prosperous eating of copious amounts of beef. The postwar period's prosperity facilitated one of the greatest population booms in American history, yet the increase in production outran even this unprecedented population growth. In 1940 the average American consumed 54.9 pounds of beef in one year. Just ten years later in 1950, that same American would have consumed an average of 63.4 pounds of beef per year. By 1956 per capita

consumption of beef was above 85 pounds per year for the average American.[167] Years of war production were not taken as outliers, but instead, created new economic and social criteria for the beef industry. These few years of war overproduction did not return to a somewhat normal level in postwar years, instead continuing and increasing the amount of beef processed and consumed by Americans. Ultimately, these factors that propelled beef maximization during this period led to a market of relatively inexpensive and overproduced beef, enabling fast food chains, convenience foods, and supermarkets across the nation to flourish.

WWI, The New Deal, and the Growth of the American Beef Industry

World War I had a similar impact on beef as it did corn. Despite heavy government pressures to drastically increase production, American ranchers and beef producers moderately increased beef supply, but this increase was nowhere near as drastic as it would be later on in this period. This is due to the beef industry already operating near or at maximization levels for the time. American beef was in high demand, but transportation and expensive input costs provided major economic road blocks to greatly increasing output. The major cost for beef producers was land, and in the pre-war years of 1910-1914, years that would be used as standards for parity pricing for decades following WWI, land was not cheap. One major secondary cost was feed, and while the majority of American cattle at this point were raised and finished on mostly grasses, feed cost was a significant expense during winter months. Furthermore, feed was much more expensive because the subsidization of overproduced corn had not yet provided a cheap source of calories for cattle. There was expansion in production, however, from just over 6

[167] USDA, Agricultural Marketing Service. *Meat Consumption Trends and Patterns (*Washington D.C.: U.S. Government Printing Office, 1960), 34.

billion pounds of beef in 1914 to 7.7 billion pounds in 1918.[168] While the numerical increase of around 1.7 billion pounds seems negligible by today's beef production numbers, the percentage of increased supply, of around 28 percent, was astounding. Additionally, American consumers were persuaded to consume less beef during WWI in order to strengthen the supply of meat heading to American and allied soldiers. Propaganda posters such as Figure 2 below flooded American society, pushing the patriotic ethic of rationing on Americans as a way to participate in the war effort at home. The opening up of foreign sources of demand, especially when combined with total war and government pressure, wielded immense power over American agriculture during this period.

Figure 2. Wartime food rationing poster.[169]

Following WWI, production decreased, and decreased dramatically during the mid to late 1920s. These were lean years for beef, and the AAA attempted to further cut production of beef.

[168] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production*. http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

[169] U.S. Food Administration Food Rationing Poster, 1917. Britton, L. N. *Eat more corn, oats and rye products-- ... : eat less wheat, meat, sugar and fats, to save for the Army and our allies.*. New York, N.Y.. UNT Digital Library. http://digital.library.unt.edu/ark:/67531/metadc361/. (Accessed March 16, 2014).

The study of American beef provides another example of the AAA's failure in reversing the trend toward systemic and entrenched overproduction in American agriculture. We've seen the AAA's failure in curbing output maximization practices in corn production, and the supply of beef saw a similar expansion in the 1930s. While the cattle industry was not a part of the acreage allotment programs of the AAA, marketing quotas and price goals were in place.[170] In 1932, the year prior to the AAA inception, just under 5.8 billion pounds of beef was slaughtered. This number rose to 6.4 billion pounds in 1933, and then to 8.3 billion pounds in 1934.[171] This output for 1934 was greater than any other year in American history, despite governmental attempts to normalize production. This number proved to be an anomaly for the 1930s however, as the remaining years hovered around 7 billion pounds of beef per year. To put this another way, American agriculture produced as much in the late 1930s, in the midst of an agricultural depression of very poor prices for almost all agricultural commodities, as it did during the peak of WWI.

Throughout the years of the late 1930s, American beef producers maintained this level of output despite governmental attempts at solving the crisis of overproduction. This was in large part due to the economic prosperity of WWI, as farmers were introduced to great prices and standards of living. The continuation of maximum beef output was an attempt to maintain their livelihoods. In many cases, farmers took on substantial debt in order to expand and capitalize on very high prices, and when these prices fell following WWI, a combination of lower prices and decreased output would have been disastrous to many farmers. Much like with corn, WWI and subsequent technological developments during the 1920s and 1930s, years of poor prices and heavy government intervention, laid the foundation for vast expansion capabilities in WWII.

[170] Conkin, *A Revolution Down on the Farm*, 63.
[171] Ibid.

Beef production began to expand exponentially during WWII, and continued to increase output until the 1970s.

During WWII, the beef industry had the necessary infrastructure and technological advances that facilitated a noteworthy expansion of production. Output continued to be maximized throughout the war, and production continued along its trajectory of ever-expanding maximization. During peacetime following WWI, the beef industry continued to produce at or near maximization levels set in WWI, and these levels were greatly expanded due to massive foreign demand during WWII.

WWII, Postwar Expansion, and the Acceptance of Overproduction

In 1939 beef output totaled just over 7 billion pounds. This number is very consistent with production figures during WWI. Output quickly ratcheted upwards during the war, with the promise of high prices and government price stability. By 1945, the end of serious conflict in Europe, beef producers had destroyed old production highs, and pumped just under 10 million pounds of beef into domestic and foreign markets.[172] This increase not only represented the power of foreign demand, but created a new benchmark for beef production. Even in the years following the war, producers would maintain these high levels of output, and quickly build on these record numbers.

Out of fear of a rebirth of WWI era price manipulation of consumers by farmers and food producers during high wartime prices, The Roosevelt administration attempted to preemptively control prices for a wide variety of agricultural products. The Office of Price Administration (OPA) targeted beef prices and were successful in maintaining a reasonable price for American

[172] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production.* http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

consumers. The OPA attempted to hold corporate and monopolistic interests in check, and block further economic difficulty for consumers during high wartime demand. The price for beef rose around 60 percent due to heightened demand during WWI. The OPA was able to limit beef prices' increase to around 30 percent during WWII, enabling millions of Americans to still afford ample beef at palatable prices. Despite the successes of the OPA in curtailing major price increases during WWII, individual cattle raisers were able to greatly increase their income. While retail meat was subject to price controls, the value of live cattle raised dramatically. Live cattle was not under the auspices of the OPA, but instead had prices set by the USDA. This allowed cattle prices to be pushed upward, causing economic incentive for cattle raisers to expand production and reap very high short term profits. In effect, the actions of the OPA put a squeeze on retailers with price controls that benefited consumers, but lacked of control over the prices and supply of livestock raisers and producers. In 1941, live cattle sold for around $9 per pound and by 1943 this rate had risen to around $12.50 per pound. Farmers and ranchers who supplied cows saw a massive increase in annual income throughout the war- from around $1.7 billion in 1941 to $3.3 billion two years later. This growth in the beef industry occurred while the Roosevelt administration attempted to control prices in order to avoid price hikes similar to those during WWI.[173] Livestock raisers' prosperity during wartime market conditions made postwar decreases in output hard to fathom. Their successes helped entrench the ethos of abundance in American agriculture, providing unprecedented prosperity during brief periods of excited demand.

Rationing also played a role in keeping the price of beef relatively steady during years of extremely high demand and output. The impact of rationing is hard to calculate in terms of beef prices, but Americans by and large accepted the patriotic duty of wartime rationing, especially on

[173] Hamilton, *Trucking Country*, 71-73.

high demand items such as beef, dairy, sugar, and bread. If households cut beef consumption by a substantial margin, yet prices were allowed to stay relatively constant, it is hard to calculate the impact that consumer actions can have on wartime goods, especially in an agricultural market that had been very far removed from the traditional models of consumers and producers.

Figure 3. Wartime food production propaganda poster.

It is obvious, however, that food rationing, especially in regards to beef, had little effect on output and the characteristic of 20th century agriculture to maximize production at all costs. Such an extraordinary level of demand existed for American beef that the actions of a fraction of American consumers did little to curb the growth of the beef industry or maintain prices. In fact,

despite the actions of citizens' rationing and the devotion of an entire bureaucracy, the OPA, beef prices did rise substantially throughout the war. Government and corporate propaganda pervaded the marketplace, such as this poster in *Figure 3* pushing farmers to maximize output.[174] By 1947, beef's output continued to show signs of growth. This was fueled in large part by Marshall Plan allocations of relief to war-torn Europe, but demand continued to grow domestically as well.

Upon entering the post WWII era, the Truman administration faced difficult challenges regarding overproduction, and reconversion to a peace time economy. For agriculture, reconversion ostensibly meant cutting production, curtailing surpluses, and focusing on conservation, all entrenched tenants of the liberal era of agricultural management under the auspices of the New Deal. While the Truman administration adopted similar New Deal style policies to transition back to a peacetime market in domestic agriculture, stopping overproduction in the beef industry was not a part of reconversion.

The Department of War Mobilization and Reconversion provided President Roosevelt (and later Truman), his cabinet, and congress with quarterly reports during WWII, summarizing the economic war effort and suggesting new directions and strategies for further success during WWII. One of these reports, in July of 1945, suggested an expansion of beef's role in the American agricultural economy. Output of beef already appeared to be maximized, producing a record breaking supply of beef of over 9 billion pounds in 1944.[175] The report, signed by Department secretary James F. Burns stressed the necessity of beef expansion during reconversion. Burns began by praising American meat producers, and suggesting that "Output of

[174] "It's The American Farmers' Job To Keep Them Fed!" *War-Era Food Posters Online Collection*, From the Collection of the National Agricultural Library. (Accessed March 29, 2014). http://www.good-potato.com/beans_are_bullets/chapter6/ch6gallery14.html

[175] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production*. http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

beef and veal is expected to rise to another new high."[176] This prediction came true in 1945, the year that marked the peak of WWII beef production, at just over 10 billion pounds. These record highs, however, in years of abnormal and unsustainable demand caused by total war and excited foreign demand, were not high enough for America in the years following WWII. Burns added, "The War Food Administration and the Office of Price Administration have taken steps to increase the volume of cattle flowing to federally inspected slaughterhouses." These federally inspected slaughterhouses, home to the processing and transformation of millions of cows into beef, catered to a highly consolidated and efficient beef and meat industry, headed by four or five corporations that controlled the vast majority of American meat.

The OPA's price controls greatly impacted the profits of these massive meat giants, notorious for attempting to monopolize the nation's meat supply through vertical integration and price setting.[177] Price controls also gave economic incentive to produce more and more, constantly furthering the means of maximization in order to increase income. Profits that could not be earned by price gauging, could be earned by increased scale and efficiency. The secretary proposed methods of institutionalizing further expansion of beef production, far greater than these wartime levels of production, which WWI seemed to prove were unsustainable. He suggested that the federal government's role during the processes of agricultural reconversion to a peacetime market was "To increase production and slaughter through an integrated program to boost price guarantees to producers, payments to widen operating margins to cattle feeders, and additional subsidies for processors."[178] In other words, instead of returning to a relatively more modest level of beef production and consumption, Burns was a proponent of not only continuing

[176] Burns, The Department of War Mobilization and Reconversion, *Quarterly Report, July 1945*, 42.

[177] For more on meat and dairy monopolization throughout the early and mid 20th century, see Hamilton, *Trucking Country*.

[178] Burns, The Department of War Mobilization and Reconversion, *Quarterly Report, July 1945*, 44.

the high levels of beef slaughter but expanding this amount through federally supported prices. Beef producers took advantage of enhanced transportation, genetic, and agricultural technologies that allowed for a massive surge of output quickly in the years following the war.

American lust for red meat quickly took root after victory in WWII, in large part due to the government's propaganda campaign for beef during the war.[179] Beef's reputation was aggrandized by portraying red meat's role in creating the strong and virile American man, and only a man of such prowess could win such an unimaginable war.

Figure 4. Wartime food rationing propaganda. [180]

[179] For a more thorough discussion on food rationing and propaganda, See Amy Bentley, *Eating for Victory: Food Rationing and the Politics of Domesticity.*

[180] "Buy Fresh Fish, Save The Meat." *War-Era Food Posters Online Collection*, From the Collection of the National Agricultural Library. (Accessed March 29, 2014). http://www.good-potato.com/beans_are_bullets/chapter6/ch6gallery14.html

The poster in *Figure 4* suggests that meat had intrinsic characteristics that fish lacked, necessitating the use of mighty beef as a kind of boost for American and allied troops. American commitment to beef was entrenched following the war, as economic prosperity for urban America led to sufficient purchasing power to consume plenty of red meat. This postwar period of increasing levels of income and purchasing power bolstered the beef industry, maintaining a high level of domestic demand once foreign demand tapered off. Consumption of beef in the postwar period was borderline ravenous in terms of per capita consumption. In 1960, in a report chronicling the past major period of activity and growth in the meat industry, the USDA Agricultural Marketing Service asserted that beef production had risen at a much greater level than population growth.[181]

The beef industry did not struggle as the majority of the crop industries did following WWII. Demand for beef continued to expand despite its overproduction. In one USDA pamphlet titled "What Peace Can Mean To American Farmers: Post-War Agriculture and Employment," the department warned farmers, "unless definite steps are taken to prevent it, peace may mean a substantial decrease in demand for agricultural commodities," and that "positive and practical substitutes for the war-induced demand for agricultural products must be found."[182] In the beef industry, due to ever increasing demand throughout this period, there was no real need for major economic assistance. However, the beef industry did provide major economic assistance to the corn industry, by providing a way to transform cheap, overproduced corn into fattened, valuable beef.

Food historian Harvey Levenstein wrote, in his book titled *Fear of Food: A History of Why We Worry About what We Eat*, that per capita consumption of beef rose by more than 70

[181] USDA, *Meat Consumption Trends and Patterns*, 4.

[182] USDA, *What Peace can Mean to American Farmers: Post-War Agriculture and Employment* (Washington D.C.: U.S. Government Printing Office, 1945), 3.

percent from 1946 to 1966. The intriguing aspect of this statistic in Levenstein's work is that it follows an entire chapter chronicling the numerous food scares and beef recalls that happened in years prior to this massive surge in consumption, most notably the charge that government meat inspectors were allowing cattle carrying tuberculosis to be processed along with healthy cattle into ground beef throughout the 1930s.[183] This suggests that beef resided above threats of public safety and nutritional scares. American consumers did not react, or vote for change with their food dollars as Michael Pollan might say, to blatant health and ecological nightmares in beef production. The machine of output maximization in the beef industry had been cemented through total war, and the ideas of maximization and efficiency firmly supplanted public health and ecological responsibility.

An article that carries these consumption statistics a few years later was written by Alan I. Marcus, a historian of animal and human nutrition and nutrition technology. He suggests that beyond the record consumption levels of the mid 1950s, Americans' ability to devour overproduced and relatively inexpensive beef had not been fully realized. He states that consumption of beef nearly doubled between 1954 and 1972, fueled by a "red meat lust" among the rapidly growing number of Americans with sufficient purchasing power to satisfy their beef needs.[184] As output proliferated, and retailers were able to keep prices affordable, consumers continued to drive production upward, resulting in an agricultural sector producing considerably more beef in times of peace, than in times of global war and European food shortages.

In 1946, President Truman and Secretary of Agriculture Clinton P. Anderson dropped price controls on American beef. With Europe still dependant on Marshall Plan agricultural aid and Americans revealing a propensity to demand higher quantities of beef, prices increased by

[183] Levenstein, *Fear of Food,* 50-60.

[184] Alan I. Marcus, "The Newest Knowledge of Nutrition: Wise Burroughs, DES, and Modern Meat." (*Agricultural History Vol. 67, No. 3, Summer 1997*), 67.

around 70 percent. Truman attempted to re enact legislation to control retail beef prices, and beef producers and cattle raisers responded by holding stocks of cattle and beef, to create a shortage and keep prices high. Americans feared some sort of meat famine due to Truman's threats of governmental price intervention. This tactic of withholding beef from market, one analogous to the Farmers Holiday Movement during the crisis of low prices during the late 1920s, worked and Truman relented, keeping price controls out of the beef industry.

Polemical tirades from news outlets and whispers of beef shortages defeated the logical attempt to allow markets to readjust without price interference. The actual numbers of beef production, however, do not reveal any sort of shortage of beef. Once price controls were cut in 1946 and prices for beef soared, Truman attempted to re introduce price controls to appease consumers prior to the 1946 election. In response to this, ranchers threatened to enact a forced meat famine by withholding cattle from the stockyards, which they carried out to some degree.[185] Ranchers and cattle raisers viewed these price controls as attacks on their standard of living, and expected strong beef prices similar to those during WWII to continue for years. However, beef production in 1946 remained over 9 billion pounds, or higher than every year of output during WWII with the exception of 1945. Then output maximization continued its ascension in the beef industry, as the following year, 1947, 10.1 billion pounds of beef were produced.[186] Demand continued to soar and production followed suit, annually expanding and maximizing production of beef.

After Truman's reelection in 1948 and appointment of Charles F. Brannan as the Secretary of Agriculture, beef production ramped up quickly. Brannan attempted to bring about a

[185] Levenstein, *Fear of Food,* 50-54.

[186] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production*. http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

resurgence of New Deal era economic liberalism to agriculture, attempting to limit corporate power, assist smaller producers, and enhance price stability and conservation practices. He also called for direct payments to beef cattle producers, a sector of the industry that to this point had minimal governmental interference. As beef production soared, prices for beef began to fall, causing a problem of poor living standards among cattle farmers. Brannon wanted direct payments to farmers to fill the void between low market prices caused by overproduction, and the higher prices cattle raisers and producers wanted in order to maintain a decent standard of living. He also wanted to put a production cap on eligibility for government price assistance, in other words, producers could not bring an unlimited supply of products into the market at supported prices. Brannan's plan was that these output caps would impede the already chronic growth of industrial farming, ranching, and food processing.[187] This liberal approach was derided by conservatives as socialism, and in the midst of the ideological war between communism and free market systems, the "Brannan Plan" was defeated, and corporate interests entrenched themselves in agricultural policy. Subtle transformations occurred during this transitional administration after the failure of the liberal and somewhat forward thinking Brannan Plan. Most notably, agricultural policy moved away from production control, and towards efficiency, technology, and maximization, and this was vividly evident during the conservative regime of President Dwight D. Eisenhower.

By the end of 1953, the first full year of President Eisenhower and Secretary of Agriculture Ezra Taft Benson, beef production had again expanded to new heights. Beef producers, by 1953, were bringing almost 12.5 billion pounds of beef into retail circulation. This amount was over 20 percent greater than peak WWII production in 1945. By 1954, when price supports from the Korean War were set to expire, production rose again, to just under 13 billion

[187] Conkin, *A Revolution Down on the Farm*, 127-128, and Hamilton, *Trucking Country*, 69-70.

pounds.[188] Eisenhower and Benson had problems of overproduction in many agricultural areas, but were not as worried about reversing trends towards systemic output maximization as they were about minimizing the image of socialism in agriculture. The administration initiated a system of flexible price supports, aimed at minimizing federal money in agriculture. This had little success, and saw further expansion in beef production, to 13.5 billion pounds in 1955 and 14.4 billion pounds in 1956. In 1956 the administration changed course, and turned towards a more liberal approach to controlling overproduction. Their Soil Bank and Conservation Reserve Programs failed to budge the ever growing capabilities of agricultural technology and efficiency, leading the administration to see marketing, consolidation, fast food, and technology as the solution. Overproduction was now treated as a problem of under-consumption, not a problem of chronic and systemic overproduction. Beef output remained relatively steady throughout the late 50s at its temporary state of maximization. Producers averaged around 14 billion pounds of beef per year, reaching 14.7 billion pounds by 1960.[189]

The Modern Beef Environment

One of the many factors associated with beef's overwhelming takeover of post WWII food markets is its relationship with corn. The environmental history of American beef cannot be separated from corn, and vice versa. Throughout the years following WWI, during WWII, and following WWII, these two agricultural products developed a symbiotic relationship that allowed both to flourish, and forever changed the dynamics of American food, farming, and agricultural policy.

[188] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production*. http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

[189] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production*. http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

While corn has existed in some capacity in cattle feed for over a century, the extent of usage of corn feed has proliferated during this specific time period. This is due in large part to corn's low prices relative to keeping beef cattle grazing on grass until slaughter. In addition to corn being cheaper as an input, corn's innate ability to fatten cattle enabled superior marbling, one of the greatest determinants of beef being graded highly by the USDA. These higher grades result in higher prices for the cattle raiser or meat processor. In addition to grading corn-fed beef favorably, the USDA's policies have incentivized corn usage as feed for decades.[190] In 1959, after President Eisenhower's Soil Bank Program failed to control surpluses and overproduction with traditional acreage allotments and conservation payments, the USDA dropped all production controls over corn. This resulted in a large swelling of the corn supply, surpluses increased, and prices dropped quickly. This had a tremendous impact on the beef industry, and overproduction of corn, now without governmental limitations, resulted in cheap feed and the ability to expand and further maximize beef output.[191] With such an abundance of cheap corn available, why would the USDA not attempt to transform cheap corn into value added proteins that symbolize a thriving economy and bring greater returns via taxes? Beef is "finished" on corn while housed in feedlots, and gains considerable weight in the process. The gradual movement towards a beef economy based on corn feed "finishing" results in more beef output per cow, and more beef at considerably lower prices.

Food historian Roger Horowitz points out in his book, *Putting Meat On the American Table* that many feedlot operations elected to begin their own corn operations as well, in order to further drive down costs of cattle raising. Feedlots grew and consolidated in response to the economic advantage of feeding and finishing cattle on corn based feed, and the ability to

[190] Pollan, *The Omnivore's Dilemma*, 74-77.
[191] Conkin, *A Revolution Down on the Farm*, 130.

compress growing times for beef cattle by fattening them rapidly, and enabling their body to maximize growth and minimize disease and death by using antibiotics and hormones. Horowitz states that in major feedlot hubs like Kansas, irrigation technology allowed feedlot operators to invest in their own corn operations as well. This resulted in massive increases in the water needed to produce beef. In Kansas, for example, irrigated corn fields for cattle feed grew tenfold from 1950 to the early 1970s, from around 200,000 acres under irrigation to over 2 million irrigated acres of corn and other grains.[192]

In 1954, an article in the *Journal of Animal Sciences* written by a collection of researchers found that cows fed a corn diet gained an average of 1.2 kg per day, and graded out around 63 percent better than cows that were not fed corn.[193] A more recent work by Donald J. Stull and Michael J. Broadway titled *Slaughterhouse Blues: The Meat and Poultry Industry in North America,* suggests that cows eat somewhere around 30 pounds of corn based feed per day, and gain around 3 pounds of body weight per day. Cattle shipped to feedlots lose around 5-6 pounds per day in transit, so upon arrival, corn feed quickly fattens them back up and expands their beef potential.[194] As this feedlot-corn model came to dominate cattle production throughout the twentieth century, producers were able to get more beef from each cow. This was due in large part to corn feed's role as the enhancer of beef, and in many ways, corn replicated its own productivity successes once it became used industrially in beef production. Only corn, a crop that exponentially multiplied its yields from WWI to the present without noticeably expanding planted acres, could bring about such a similar increase of beef per cow.

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[192] Horowitz, *Putting Meat on the American Table,* 135-136.

[193] Geurin, H.B., J. C. Thompson, H. L. Wilcke and R. M. Bethke. "Cob Portion of Ground Ear Corn as Sole Roughage for Fattened Cattle" (*Journal of Animal Sciences, Vol. 13, 1954),* 984.

[194] Donald J. Stull and Michael J. Broadway, *Slaughterhouse Blues: The Meat and Poultry Industry in North America (*Belmont, CA: Wadsworth/Thompson Learning, 2004), 30-31.

In addition to corn feed, genetic and biological revolutions have transformed the productivity of beef cattle. Following WWII, noted agricultural historian Paul K. Conkin points out that selective breeding underwent a major transition that greatly impacted output and productivity. Artificial insemination allowed for nearly endless generations of offspring from bulls with favorable size, structure, and meat carrying capacity. Beef producers also began keeping detailed production records, maintaining records of high levels of beef output per cow. Prior to WWII, breeders focused on breeding pure breeds, believing that the consistency of a genetic lineage resulted in favorable output from beef cattle. Around the 1950s, breeders began breeding beef cattle for their production, rather than their breed. This led to the rise of the angus breed, and the incorporation of many European and Indian cattle due to their output capabilities.[195] Many mixed breeds out produced pure breeds, and cows that produced the most beef at slaughter were bread, leading to generational beef maximization in the cattle industry.

The use of antibiotics and hormones in beef cattle on an industrial scale drastically increased as the use of corn feed increased. Antibiotics were used not only as a method of disease prevention in cows, but as a growth enhancer. As the diet of beef cattle transitioned from grass to corn near the end of their lives, cows became sick due to the evolutionary predisposition to eating grass. Corn caused or was related to a mess of internal problems in cattle, most notably the outbreaks of mad cow disease and e-coli. The feedlots the cows were housed in added additional disease risks, due to cows standing in excrement and constant confinement.[196] Antibiotics were added into feed as a way of lessening the impact that cows' environments had on their bodies. Hundreds of feeding experiments during 1950 to 1966 overwhelmingly suggested that the use of antibiotics in cattle feed improved feeding efficiency, or, allowed the

[195] Conkin, *A Revolution Down on the Farm*, 121.
[196] Pollan, *The Omnivore's Dilemma*, 65-84.

corn based calories to saturate completely, and resulted in bigger cows and more beef. These studies suggested that antibiotics alone increased cow size in feedlots by around 4 percent.[197] In 1951, American beef raisers spent around $17.5 million on antibiotic additives for animal feed, and by 1961, this increased dramatically to around $43 million.[198] American beef raisers investments in antibiotics resulted in dramatic increases in the supply of beef. Furthermore, when combined with the increased consumption of corn feed, antibiotic use transformed ecologies of cow and human alike.

Much like antibiotics, hormones allowed for further entrenchment of the economic ethos behind modern meat. The overwhelming use of corn feed has created an unstable cow ecology, and nature has reacted with various new diseases and health concerns in the beef supply. Cow feed contains a variety of ingredients, varying from feedlot to feedlot. Usually, feedlots hire nutritionists and veterinarians to concoct these feed mixtures, resulting in specific feed blends and specific beef. These blends all contain some sort of growth hormones and appetite enhancers in order to maximize beef output per cow. Because cows did not evolve to digest massive amounts of grain, antibiotics and hormones are pumped into feed, to maintain the cow's adherence to loosely regulated health codes.[199] Hormonal imbalance is a natural effect of massive dietary change, even in humans. Due to cows' transition from grass to grain, hormone levels are monitored and kept in check by adding hormones into feed.

One hormone that greatly impacted American beef and entrenched the economic rationale behind the addition of synthetic hormones to animal feed was stilbesterol. This synthetic estrogen hormone was developed for agricultural use by Wise Burroughs, a professor

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[197] Terry G. Summons, "Animal Feed Additives, 1940-1966" (*Agricultural History, Vol. 42, No. 4, Oct. 1968*), 308.

[198] Ibid.

[199] Ken Midkiff, *The Meat You Eat: How Corporate Farming has Endangered America's Food Supply* (New York: St. Martin's Press, 2004), 126.

of animal husbandry. Burroughs believed that a body's hormones, either a cow or human, could be manipulated to pursue almost any desired outcome more efficiently. Burroughs did not pioneer the science of hormonal manipulation, but did pioneer its use in animal feed.[200] Stilbesterol, also known as DES, was pioneered for agricultural use in the mid 1950s, and by the early 1960s an overwhelming majority (up to 95 percent) of cattle raisers were using this feed additive to promote growth.[201] Burroughs' study suggested that the implementation of this cheap hormone into beef feed would result in cattle reaching market weight (1100-1300 pounds) 35 days sooner than without it. This would save over 500 pounds of feed per cow, and greatly increase the profitability of beef. In 1962, Burroughs estimated that the use of stilbesterol alone in beef production had increased output by around ten percent. To put that in real figures, he said that his synthetic estrogen had made available over 100,000 tons more beef than would have existed without stilbesterol, and this amount was produced from the same number of cows, and the same amount of cattle feed.[202]

Overproduction reached new levels with the use of feed additives, enabling the consumption of more, and cheaper beef. In his article over this topic, historian Alan I. Marcus states that stilbesterol was the first artificial hormone used for growth enhancement in the beef industry. Millions of pounds of beef pumped with hormones and antibiotics flooded the marketplace, and following the development of stilbesterol, various other substances were developed, further expanding the productivity of cows. After over twenty years of ubiquitous use in the beef industry, this specific hormone was outlawed by the FDA in 1979 because of carcinogenic properties.[203]

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[200] Marcus, "The Newest Knowledge of Nutrition: Wise Burroughs, DES, and Modern Meat," 72.
[201] Ibid., 68.
[202] Summons, "Animal Feed Additives, 1940-1966", 311.
[203] Marcus, "The Newest Knowledge of Nutrition: Wise Burroughs, DES, and Modern Meat.", 66.

This way of thinking about animal nutrition is the foundation of modern meat. Much like human's extractive and exhaustive relationship with the earth in corn production, modern meat production is based on an exhaustive relationship between man and animal. No matter the ecological, evolutionary, or environmental consequences, modern agricultural and animal science has focused on manipulating animals' digestion and their genetic makeup to increase efficiency of beef production and total output. This is one major example of humanity seeing the non-human world as a canvas on which history or human action happens. Instead of understanding the non-human world's place in modern agriculture, the beef industry has evolved to treat the non-human world as an industrial input, open to manipulation and forced change. This manipulation has resulted in countless health scares in conventional meat production, environmental damage to areas housing these cows, and a transformation of almost an entire labor group of industrial factory food workers. As nature is manipulated, it responds, interacting with humanity in various ways. The response to these problems in the modern meat industry, however, has become banal, calling for more inspection, higher safety regulations, and improved technology to eliminate the issues. This relationship directly stems from an industrial ethos being applied to agriculture, where the onward march of productivity, technology, and output maximization has positioned itself as conqueror of natural limitations, subject only to profit.

Following the Eisenhower administration, the Kennedy, Johnson, and Nixon administrations did little to change beef's trajectory. The federal government made direct payments to beef raisers to insure quality pricing, but no cap on production surfaced. Being a capital intensive business, the livestock industry remained highly consolidated, with the majority of American beef coming from one of four or five major corporations. Changes in demand towards poultry slowed beef's growth, but poultry by no means turned beef's production back

towards a normal level- Americans just consumed and produced much more poultry to go along with the historic highs in beef output. From 14 billion pounds of beef production in 1960, already double the WWII production level, output continued to new levels of maximization. By 1965, Americans processed over 18 billion pounds, and by 1970, over 21.5 billion pounds. In the mid 1970s, around the time when Americans began consuming more poultry, beef output still amounted to around 25 billion pounds.[204] In other words, there was no major decrease in production despite major changes in demand, and output maintained a level of peak production throughout the following years.

Corporate consolidation and increased efficiency in beef production had a myriad of social and economic effects in America, many of these effects do not need to be rehashed here. One unfortunate development throughout the history of beef during this period of total war and overproduction that should be pointed out is the gradual loss of the individual farmer's share of the final price. Changes in retail beef prices have little effect on the people who actually raise cattle in their pastures, and a greater effect on beef processors, marketers, and packers. Food manufacturers receive the lion's share of the immense profits from beef production, utilizing economies of scale and governmental lobbies to secure profits at high environmental costs. The fluctuations in beef prices are of great concern to these massive corporations, like Tyson Foods, Cargill, JBS, and National Beef, but changes in price do little to affect the livelihoods of these kings of the meat market. Farmers, on the other hand, have seen an ever decreasing portion of profits for retail beef. In *Slaughterhouse Blues: The Meat and Poultry Industry in North America*, anthropologist Donald Stull and geographer Michael Broadway succinctly summarize the farmers' loss of substantial economic reward for their raising of cattle. They wrote,

[204] USDA, *National Agricultural Statistical Service, Beef Slaughter and Production*. http://quickstats.nass.usda.gov/results/9189CBB1-98D5-3563-BD4C-CDDF09627DD8?pivot=short_desc

> Food manufacturing is the most recent stage of the third industrial revolution. It involves adding economic value to agricultural products through processing and packaging and as its importance has risen, farmers have received a dwindling portion of the final sale price. The share of the food dollar that goes to the farmer decreased from 33 cents in 1960 to just 19 cents in 2006- the remainder is absorbed by processors, wholesalers, distributors, and retailers.[205]

The incredible boom in demand for convenience and value added foods has changed the relationship between consumer and producer, or between supermarket patron and farmer. Additionally, the advent of fast food and the dining out culture has provided further separation between food consumer and food source, expanding the profits of the agricultural middle men. Due to economic uncertainty and low portions of the retail dollar, many farmers enter into production contracts with meat processing corporations like Tyson and Cargill. Under these contracts, individual farmers essentially work for corporate and industrial companies that set quotas for production, and buy at a set price. Production contracts are quite common in the corporate meat industry, more so than other sectors of the agricultural economy.[206] While chicken far and away is the most commonly contracted meat, the beef industry is following suit by expanding the percentage of beef produced under contract.

In the introductory chapter to the USDA's *Yearbook of Agriculture, 1943-1947*, titled "Life More Abundant", Secretary of Agriculture Clinton P. Anderson lauded the coming of science, efficiency, and industry to agriculture. He placated those who might question the march of modern agriculture, writing,

> But in truth the very bounty of the research and invention here set forth might cause uneasiness. The thoughtful reader is bound to ask one question or many, unlike in wording but alike in intent: Does not the same DDT that kills the Japanese beetle also kill the honeybee? By breeding a new wheat that withstands rust are we not making it more susceptible to a different enemy? Can we never be satisfied- must we go on with research forever? Does not this technology lead sooner or later to overproduction? On such points I have no fear: We did not stop making automobiles for fear we would wreck them; or

[205] Stull and Broadway, *Slaughterhouse Blues,* 13.
[206] Gardner, *American Agriculture in the Twentieth Century*, 70-72.

> leave off erecting dams, lest they burst; or refuse to construct homes because they might cave in. And need we be concerned that life be too abundant, that we and others in the world will have too much good food, too many clothes, too many medicines for our ills, too much leisure to look upward?[207]

This quotation encompasses the decades of agricultural policy following WWII. Beef producers took advantage of a federal system that all too often looked the other way. The deeply intertwined nature of American agriculture, food policy, and legislation allowed an environmentally irresponsible system of meat production to be valued and lauded, while overlooking crises of public health, ecological imbalance, and waste. With a rapidly growing global population, first world consumers and producers continue to waste massive amounts of farm acres growing corn and other grains to feed an inflated lust for beef. In economic and social theorist Jeremy Rifkin's 1992 book, *Beyond Beef: The Rise and Fall of the Cattle Culture*, he asserts that over 70 percent of grain and corn grown in America is fed to livestock. He continues to say that over 1/3 of the entire world's grain is fed to livestock, while beef consumption remains incredibly high.[208] Today, over twenty years later, not only has there been a continuation of massive amounts of corn and grain used for livestock feed, but additionally the USDA has subsidized the burning of billions of bushels of corn as ethanol gas. The use of corn and grain feed has pumped up beef production, putting corporate interests ahead of public health and ecological damage. David Pimentel, professor of ecology and agriculture at Cornell University, is quoted in an August, 1997 article in the *Cornell Chronicle*, saying, "If all the grain currently fed to livestock in the United States were consumed directly by people, the number of people

[207] Anderson, "Life More Abundant", *USDA Yearbook of Agriculture, 1943-1947,* V-VI

[208] Jeremy Rifkin, *Beyond Beef: The Rise and Fall of the Cattle Culture (*New York: Penguin Books, 1992), 160-161.

who could be fed would be nearly 800 million."[209] Beef production continues to operate at an unsustainable level, using massive amounts of fresh water and fossil fuels to provide cheap meat protein. Changes in consumption and demand have not altered this situation in beef production, only created more avenues for new products to be overproduced and over consumed. The situation in agriculture today has resulted in food chaos, as consumer pushes toward "natural" or "organic" products have driven organic producers to incorporate similar styles of industrial production. Consumer demand for better quality and public outcry following food recalls has not yielded safer and more environmentally conscious basic foods- only more expensive, and more elaborately marketed natural and organic options for those who can afford such a luxury. These developments, while providing great alternatives for the few, are having a negligible impact on the majority of conventional agricultural output, and provide little hope for the growing lower classes of consumers. The historical record does not bode well for the prospect of massive government intervention in agriculture to promote change, sustainability, and responsibility, and changes in consumption has failed to reverse the history of output maximization. Plans for change in agriculture are historically difficult to implement, manage, and evaluate, but steps must be taken towards a new revolution in American agriculture. This has to be a coordinated effort between government policies and subsidies, new priorities and leadership in business, and commitment to avoiding destructive agriculture among consumers. As demonstrated throughout this paper, coordinated efforts between government, business, and the consumer created and perpetuated this seemingly inescapable system of overproduction and environmental degradation during these periods of war, peace, and prosperity. Such an effort, a truly democratic effort at reform, provides a challenging yet attainable hope for food and agriculture revolution.

[209] "U.S. could feed 800 million people with grain that livestock eat, Cornell ecologist advises animal scientists." *Cornell Chronicle*, Aug. 7, 1997. http://www.news.cornell.edu/stories/1997/08/us-could-feed-800-million-people-grain-livestock-eat (Accessed March 12, 2014).

CHAPTER 5

CONCLUSION

The modern American industrial food system, so heavily influenced by overproduction and policies of ever expanding maximization grew out of the agricultural policies during and after periods of total war from the 1920s through the 1960s. This thesis demonstrated in Chapter 1 that the policies aimed at slowing overproduction from total war highs failed, and in effect fueled the trends of maximization and consolidation. Chapter 2 then looked specifically at corn, a crop that flourished in an ecology of overproduction and infiltrated the common American diet in various new ways. Chapter 3 focused on beef production and consumption and situated the political ecology of the beef industry in a larger context of war, technology, and output maximization.

This period of entrenched overproduction directly relates to the modern food supply, public health, and environmental issues in America, and has resulted in a continuation of the status quo in policies dealing with rampant practices of output maximization. While the number of critics of the modern food system seems to multiply by the day, very little change has taken place in the federal approach to food prices, supply, and this ethos of cheap and abundant food. The programs that have been a major focus of this work, such as the Agricultural Adjustment Administration and the Soil Bank, failed to effectively deal with a mounting crisis of overproduction in agriculture throughout this period. These programs stored, destroyed, or exported ever-growing amounts of surplus output in order to alleviate the economic burden of constant overproduction. These developments added to production, rather than successfully slowing an already rampant trend of maximization. Federal policies kept prices stable by these tactics, when many poor and working class Americans, especially during post-war depressions,

could not afford quality food. More recently, science and technology created new ways for surpluses to be disposed of, such as high fructose corn syrup, cheap animal feed for expansion in meat markets, and bio fuels. The same critique can be made of current agricultural policies. Instead of using subsidized and overproduced corn for animal feed and ethanol in gasoline (which requires an immense amount of gasoline to harvest), those same acres could be planted with food that could benefit those in communities where affordable, fresh produce is not an option. The subsidization of this type of approach to the crisis in modern food and population growth could result in a much more balanced diet for the growing number of malnourished Americans in an obese nation.

The economic trends set in motion during this period of total war and government subsidization have persisted, despite health epidemics, food safety scares, and a growing concern over the environmental impact of cheap food. The USDA has continued to largely favor corporate growers, who produce mostly corn, soybeans, dairy, and meat. The United States grows enough corn each year to feed hundreds of millions of people, yet the overwhelming majority is used for animal feed or bio fuel, at greatly reduced energy efficiencies. The vast majority of federal money is supporting commercial farms, farms providing industrial inputs in the form of subsidized crops. Crop subsidization is a multi-billion dollar industry, and the majority of this money flows to companies that produce food inputs, rather than food itself. The USDA is marketing a new approach to diet recommendations, but subsidy payments do not reflect the diet that they apparently view as optimal.

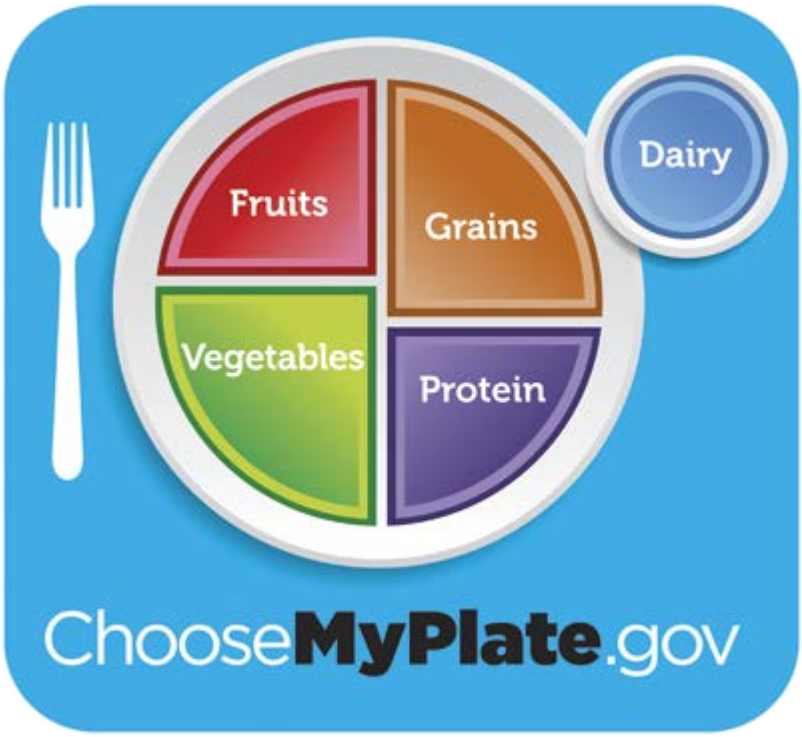

Figure 5. The current ideal diet championed by the USDA. [210]

From 1995-2012, according to the Environmental Working Group's Farm Subsidy Database, the top 10 percent of farm subsidy recipients received around 77 percent of all total subsidy payments.[211] The agricultural products leading the way in subsidies are somewhat predictable, with corn, wheat, and soybeans being the top three recipients from 1995-2012. What's shocking is that the first fruit to appear on the list is apples, at number 19, receiving less subsidy dollars than peanuts, barley, and tobacco, to name just a few. Following apples is the beet at twentieth most subsidized, but this vegetable is used often as a source for sweeteners.[212] There appears to be a massive disconnect between what the USDA is telling America to eat, which is displayed in *Figure 5*, and what it is subsidizing to make more affordable to most

[210]USDA, Choose My Plate. http://www.choosemyplate.gov/food-groups/ Accessed April 2, 2014.

[211] Environmental Working Group. *Farm Subsidy Database 2013, Commodity Payment Recipient Concentration.* http://farm.ewg.org/progdetail.php?fips=00000&progcode=totalfarm&page=conc&regionname=theUnitedStates

[212] Ibid.

Americans. This is one of the many examples of the need for an overhaul of the American food system.

This overhaul, or revolution as it could more accurately be labeled, must be led by producers and policy makers. Putting the onus on consumer action to transform the modern food supply assumes that the current system operates in a logical and traditional realm of supply and demand. Many advocates, such as Michael Pollan, Eric Schlosser, and Michael Moss push for consumers to bring about change by spending money on more natural and sustainable approaches to food production. The problem with this lies in the massive amounts of federal money being spent on conventional agriculture, creating excess demand and overwhelmingly compensating for any losses incurred by a consumer based food revolt. History has proven a federal and producer led system is difficult and nearly impossible to amend. The majority of this project has been detailing the failure of government and business in sustainably and responsibly providing Americans with affordable, high quality food. The modern system has become even more entrenched with the status quo in agriculture, being bogged down by corporate and commodity lobbyists, as well as corporate personnel serving as powerful members of office in the USDA and FDA. However, a new ethos in business and policy making must emerge to transform this unsustainable system operating in a world of finite resources, increasing transportation costs, and a growing consumer base pushing for transparency and safety.

With organic, local, and sustainably grown food prices substantially higher than subsidized conventional and processed foods, the consumer push towards this sort of system remains to be a smaller, wealthier demographic. In his book *Food in World History*, historian Jeffrey M. Pilcher wrote, "The modern paradox that only the rich can afford to eat like peasants

simply perpetuates the age-old inequality of food provisioning."[213] Other historians, most notably James E. McWilliams in *Just Food: Where Locavores Get it Wrong and How We can Truly Eat Responsibly* have challenged the limits of the modern consumer based food movements toward more expensive local and organic based food systems. If policy and business practices can manage to overturn decades of the type of trends that this project focuses on, a revolution in food is plausible. Subsidies must transition from favoring large corporate producers that churn out more corn, wheat, and soy than necessary, to favoring sustainable fruit and vegetable producers in areas previously devoted to big corn, wheat, and soy. A return to the family farm model seems overly idealistic, and the movement towards only buying local, organic, and substantially more pricey food has definite challenges in a world of growing populations and food production limitations. Somewhere in between these ostensibly opposite systems of food production lies the capability for medium sized growers to expand their share of food production. Historian James E. McWilliams calls this the "the Golden Mean of food production,"[214] and if subsidy policies transitioned to help this middle ground approach, assisting those growers who could cost-effectively, environment-consciously, and somewhat democratically produce for the majority of Americans the type of diet the USDA recommends we consume, major reform in the American food system is conceivable.

In an agricultural economy so stricken with subsidies and political baggage, the modern food supply has annihilated most vestiges of a traditional relationship between food source and food consumer. There is definite credence to the argument that subsidies by and large should not exist in agriculture. If this were the case, prices would plummet as a result of constant output maximization, and if policy kept federal price supports out of the equation, corn, wheat, and soy

[213] Jeffrey M. Pilcher, *Food in World History* (New York: Routledge, 2006), 121.
[214] James E. McWilliams, *Just Food: Where Locavores Get it Wrong and How We can Truly Eat Responsibly* (New York: Little, Brown and Company, 2009), 19.

overproduction may eventually subside. This approach could result in a gradual movement towards a healthier diet as processed foods became comparably more expensive as corn, wheat, and soy supply and price levels gradually reconfigured input costs. In the long run, this approach could also lead to a revamping of the meat industry, an industry currently so dependent on cheap corn based feed, leading to a more natural meat supply as feedlots lost their price advantages. This argument, however, does not seem to be practical in the ever expanding companionship of business and government throughout the twentieth and early twenty first centuries. I would argue that, taking agricultural subsidies as a constant, and focusing on rethinking the preferences of what crops and what types of growers need to be subsidized in order to provide more Americans with quality produce from more sustainable sources. If federal dollars are to consistently regulate and steer the food system, then those dollars should support a system that values the earth, its resources, and its people, rather than a system that exploits these things for better profit margins. This sort of approach to a food revolution would hinge on a democratic government directly responsible to all of its people, rather than responsible to only a select few.

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