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TOO MUCH OF A YELLOW THING? HOW GROWING GOLDEN KERNELS GREW INTO AMERICA’S CORN CRISIS

“We urgently need an end to these false assurances, to the sugar-coating of unpalatable facts. It is the public that is being asked to assume the risks... The public must decide whether it wishes to continue on the present road, and it can do so only when in full possession of the facts.”

I. INTRODUCTION

Americans are entrenched in a cycle of overproduction and overreliance on corn. This cycle is the result of legislative efforts to incentivize the production of corn through distinct policies that, taken in the aggregate, produce unexpected and unprecedented consequences. The United States’ corn dependency has become so alarming that industry experts suggest, as a nation, “[i]f we are what we eat, then we’re corn on legs. If we are what we drive, we’re increasingly corn on wheels.”

One could drive for fifteen-hundred miles, from Pennsylvania to Nebraska, through the Midwest and the Great Plains, to witness the colossal presence of the “Corn Belt,” which is often considered


2. See MICHAEL POLLAN, THE OMNIVORE’S DILEMMA: A NATURAL HISTORY OF FOUR MEALS 116-17 (Penguin Books 2006) (describing how processed corn has turned United States into major corn eating nation). In his description of modern American eaters, author Michael Pollan analogizes Americans to “corn’s koala.” Id. at 117. Koalas are regularly identified by their diet, which consists almost completely of eucalyptus gum leaves. See The Koala Diet, PBS, http://www.pbs.org/wnet/nature/lessons/the-koala-diet/enhanced-video-resource/7852/ (last visited Feb. 18, 2013) (describing koalas’ diet). As dependent as koalas are on eucalyptus, so are Americans on corn; both species adapted their diets to the plentiful, yet low nutrient available food source. Compare id. (describing diet of koalas), with POLLAN, supra note 2, at 116-17 (describing diets of modern humans in United States).


"a pillar of American agriculture." This approximately ninety-seven million acres of U.S. farmland now dedicated to corn crops could roughly cover the State of California.

The large acreage committed to corn production has its drawbacks, however. Between 2006 and 2011, thirteen million additional acres of farmland were dedicated to corn, at the expense of alternative crops, local environments, and the United States' food supply. Acres of farmland dedicated to wheat decreased by 2.9 million, oats lost 1.7 million acres, and sorghum crops lost one million acres, in addition to acres lost by barley, alfalfa, and sunflowers.

This Comment investigates the vast impact of the United States' dependence on corn and its negative effects. Part II explores recent congressional policies incentivizing the use of corn. Part III identifies the predominant uses of corn in the United States. Part IV discusses the consequences of an economy dependent upon corn production. Part V discusses what Americans can do to mitigate the impact of this corn dependency. Finally, Part VI provides a summation of the information provided in this Comment.

II. THE SKINNY ON CORN

The supremacy of corn in American agriculture did not happen by accident; rather, it developed as a consequence of more than "a quarter century of farm policies designed to encourage the

6. Id. (indicating amount of U.S. farmland dedicated to corn).
7. Id. (discussing environmental impacts of increased acreage).
8. Id. (discussing negative environmental effects of increased farmland acreage dedicated to corn).
9. Id. (discussing negative effects of increased corn acreage on other crops).
10. See generally Foley, supra note 5 (indicating four main reasons U.S. corn system is not good for United States). In early 2013, Jonathon Foley, Director of the University of Minnesota's Institute on the Environment, commented, "[T]he corn crop is highly productive, but the corn system is aligned to feed cars and animals instead of feeding people." Id.
11. For a discussion of corn policies, see infra notes 16-44 and accompanying text.
12. For a discussion of the United States' corn uses, see infra notes 45-108 and accompanying text.
13. For a discussion of the effects of the United States' overreliance on corn, see infra notes 109-224 and accompanying text.
14. For a discussion of ways to address the United States' corn addiction, see infra notes 225-298 and accompanying text.
15. For a brief recap of the information discussed in this Comment, see infra notes 299-302 and accompanying text.
overproduction of [corn]."\textsuperscript{16} Every five to seven years, Congress reviews and evaluates separate laws that govern policies for "[f]ederal farm support, food assistance, agricultural trade, marketing, and rural development . . . . through an omnibus, multi-year ‘farm bill.’"\textsuperscript{17} The most fundamental role of a farm bill is to reinforce “farm income and commodity price support policy – namely, the methods and levels of support that the federal government provides to agricultural producers.”\textsuperscript{18} As a commodity crop, corn is the largest beneficiary and recipient of subsidy support.\textsuperscript{19}

Agricultural policies in the form of a farm bill have been essential to safeguarding the stability of the U.S. farming industry; however, Congress ventured into new territory in 2002 with the enactment of the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill).\textsuperscript{20} The 2002 Farm Bill muddied the waters between the United States’ energy and agriculture industries by including an energy title in a farm bill for the first time in U.S. history.\textsuperscript{21} The inclusion of the energy title effectively expanded

\textsuperscript{16. Pollan, supra note 2, at 108 (discussing relationship between low cost of corn and easy calories).}


\textsuperscript{18. Id. at 1 (indicating primary purpose of omnibus legislation in farm bill form). The form of such support has varied throughout the farm bill’s history, occasionally taking the form of loans, direct payments, or crop insurance; moreover, the goal of such subsidies varies as well, encouraging farmers to increase production, decrease production, or export surpluses, etc., based on supply and market price. See Eubanks, supra note 1, at 216-40 (describing historical underpinnings of farm bills and techniques and tactics utilized by legislators to control agricultural production with federal policy).}

\textsuperscript{19. See Eubanks, supra note 1, at 227 (describing evolution of federal farm subsidies into entitlement payments to industrial producers).}


\textsuperscript{21. See id. (discussing evolution of federal farm and energy policies supporting industry growth for corn-based ethanol in United States). The 2002 Farm Bill included “Title IX: Energy,” which is the portion of the Bill dedicated to “[b]ioenergy programs and grants for procurement of biobased products to support development of biorefineries and assist eligible farmers, ranchers, and rural small businesses in purchasing renewable energy systems, as well as user education programs.” Renee Johnson, Cong. Research Serv., RS 22131, What Is the “Farm Bill?” 3 (2008), available at http://fpc.state.gov/documents/organization/104270.pdf (describing character, make-up, and purpose of 2002 Farm Bill). Specifically, nine provisions of the 2002 Farm Bill, found in Title IX “were intended to support the development and expansion of agriculture-based biofuels.” Womach et al., supra note 17, at 64 (discussing energy provisions in 2002 Farm Bill as discussions were on-going for energy provisions in next farm bill).}
corn’s dominance beyond food and into function. For example, Title IX of the 2002 Farm Bill codified the United States Department of Agriculture’s (USDA) temporary Commodity Credit Corporation Bioenergy Program (CCCBP). This program provided cash payments to corn producers in order to encourage crop growth, increase corn production, and in turn, increase demand for corn as an alternative energy source.

The 2002 Farm Bill placed domestically produced corn-based ethanol in the center of the alternative energy debate. Creating ethanol from corn is not a recent technological development; however, corn-based ethanol is one of the United States’ fastest growing industries. Corn-based ethanol’s production has increased from merely 175 million gallons a year in the 1980s to approximately 6.5 billion gallons a year in 2007. In January 2012, the United States Environmental Protection Agency (EPA) estimated that throughout 2012 only 8.25 million gallons, or 0.06%, of the nearly 15.2 billion gallons of domestic renewable fuel would be based on products other than corn-based ethanol. The EPA estimated that in 2013 renewable fuel production would increase to 16.55 billion gallons; however, the EPA requires only fourteen million gallons to be pro-

22. See Womach et al., supra note 17, at 64-68 (discussing Energy Title in 2002 Farm Bill, its goals, purposes, provisions, effects, and criticisms). The inclusion of Title IX in the 2002 Farm Bill necessitated the diversion of substantial portions of domestic corn production to biofuels, which are “liquid fuels produced from biomass.” Id. at 60. Fuel ethanol, which in the United States is ninety-eight percent corn, is blended into gasoline. See id. The effect of policies mandating the use of corn to move vehicles removes corn from the food system and extends corn’s dominance of U.S. agriculture; U.S. agriculture’s production growth to benefit biofuels is now incentivized by agricultural policy in addition to independent incentives created by energy, tax, and environmental policies. See id. at 63.

23. See Duffield et al., supra note 20, at 433 (discussing 2002 Farm Bill’s codification of temporary programs designed to stimulate U.S. economy for corn).

24. Id. (explaining mechanics of CCCBP that was intended to “stimulate demand and alleviate crop surpluses” for corn as ethanol production growth began in 2000).


26. Duffield et al., supra note 20, at 425-26 (identifying factors that played major roles in ethanol’s impressive growth rate).

27. Id. (describing rapid growth of corn-based ethanol as energy source through production increases).

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duced from corn alternatives. Putting these numbers in perspective, ethanol producers require nearly 2.7 bushels of grain to produce just one gallon of corn-based ethanol, while one acre of corn produces 138 bushels. Therefore, the sheer amount of corn required in the production of corn-based ethanol demands significant resources.

Although corn-based ethanol production has its benefits, including its domestic production capability and ability to revitalize rural economies, the industry owes its growth and success not to these characteristics, but to the federal policies and regulations that support and mandate the use of ethanol. Building on the efforts of the 2002 Farm Bill, and as a result of failed attempts at a comprehensive energy policy in 2004, Congress passed the Energy Policy Act of 2005 (2005 Energy Policy), which mandated the use of ethanol in order to increase domestic energy production and diversify alternative sources of energy. Congress encouraged the growth of corn-based ethanol by expanding the ethanol mandate and increasing federal funding for corn-based ethanol by passing the Energy Independence and Security Act of 2007 (EISA).

As a result of these policies, the use of ethanol was both mandated and subsidized by the federal government before the expiration of certain tax credits in 2011.


31. See id. (discussing production requirements for corn-based ethanol).

32. See Duffield et al., supra note 20, at 425 (recognizing ethanol’s claimed benefits while indicating product’s successes rely on many different factors, most notably federal policy).

33. See id. at 434-35 (discussing federal energy policies that support ethanol industry in United States). As discussed infra in notes 196-198 and accompanying text, this Bill included the nation’s first RFS and tax credits for ethanol producers. See also Duffield et al., supra note 20, at 435.

34. See Duffield et al., supra note 20, at 439-40 (discussing programs created via EISA).

A recent Farm Bill, the Food Conservation and Energy Act of 2008 (2008 Farm Bill) continued the comingling of domestic energy and agricultural industries through reinforcement of Title IX by supporting renewable energy programs through subsidies and regulatory actions. As in the 2002 Farm Bill, the 2008 Farm Bill also provides elements more traditionally included in a farm bill, such as income supports, price supports, and acreage set asides, which act as incentives for American farmers to keep crop prices, and accordingly farmers’ incomes, high and stable. After Congress failed to pass a new farm bill by September 2012, the 2008 Farm Bill received a nine-month extension as part of the Fiscal Cliff solution reached on January 2, 2013. In the summer of 2013, Congress again failed to pass a new comprehensive farm bill.

A major obstacle to the passing of a new farm bill in 2013 was food stamps. Nutritional programs, such as food stamps, have influenced previous farm bills with their focus on “nutrition and public health” and historically make up approximately fifty percent of each farm bill’s available spending. Instead of capitalizing on this opportunity for real reform of U.S. agriculture by revamping the United States’ “food bill,” Congress further entrenched Americans

36. See Angelo, supra note 25, at 633 (identifying federal actions influencing biofuel policy in United States).

37. See id. at 625 (citing Food, Conservation, and Energy Act of 2008, Pub. L. No. 10-246, 122 Stat. 923 (2008)) (discussing 2008 Farm Bill). The 2008 Farm Bill was generally a reauthorization of previous farm bills and maintained the basic structure of pre-existing policies, while adding only a few additional programs. See id. The purpose of set asides is to encourage farmers to conserve lands for future use and control the supply of crops by limiting usable acreage. Id.


40. See Moore, supra note 39 (identifying issues Congress faced in adopting new farm bill).

41. Id. (identifying food stamps as impediment to farm bill’s passing); see also Eubanks, supra note 1, at 273 (identifying historical role of nutrition programs in farm bills).
in their continued overreliance and overproduction of commodity crops.42

Ultimately, the implementation of Congress' lofty goal of energy independence based on the promise of corn-based ethanol has had real and lasting impacts on agriculture, health, and the environment.43 Although seemingly distinct, these congressional policies find common ground in their promotion of American-grown corn.44

III. CORN'S PREDOMINANT USES – THEY ARE NOT WHAT YOU THINK

The United States is by far the largest producer of corn in the world.45 In 2012, American farmers harvested over eighty-seven million acres of corn.46 Such acreage produces over ten billion bushels of corn, accounts for approximately one quarter of the United States' total crop harvest, and is nearly forty percent of the market share of corn production globally.47 Although corn production in the United States has nearly doubled since the 1980s, corn

42. See generally Daniel Imhoff, The Farm Bill Matters, SLATE (Oct. 31, 2012, 1:22 PM), http://www.slate.com/articles/news_and_politics/food/2012/10/farm_bill_2012_expiration_why_congress_needs_to_take_food_policy_seriously.html (discussing how farm bill could be used to promote healthy and sustainable food for future generations); see also David Rogers, Fiscal Cliff Deal Includes Farm Bill Extension, POLITICO (Jan. 1, 2013, 7:03 AM), http://www.politico.com/story/2013/01/fiscal-cliff-deal-includes-farm-bill-extension-85641.html (discussing failure of farm bill extension to achieve substantive reform needed).

43. For a discussion of the negative effects of the ethanol mandate, see infra notes 195-224 and accompanying text.

44. See Lowry La Seur et al., supra note 3, at 203-06 (discussing overlap of federal policies supporting and influencing agriculture's contributions to ethanol production).


consumption has decreased since peaking in 2004 and 2005.\(^{48}\) Corn consumption has decreased because the vast majority of American-grown corn requires significant processing before it can be consumed and larger percentages of corn production are being allocated to corn-based ethanol and other industrial uses.\(^{49}\)

In 2000, the National Corn Growers Association estimated that only twelve percent of corn production was actually consumed, either directly or indirectly, by Americans.\(^{50}\) By 2012, total human consumption of American-grown corn had decreased to ten percent.\(^{51}\) Cattle, livestock, and other farm animals consume more than forty percent of corn yields annually.\(^{52}\) Surpassing both human and animal corn consumption, production of fuel consumed over five billion bushels of corn during the 2011 to 2012 market year, approximately forty-four percent of the nation’s harvested crop.\(^{53}\) Based on current data, this section examines three

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\(^{48}\) Corn: Background, USDA ERS (2012), http://www.ers.usda.gov/topics/crops/corn/background.aspx [hereinafter Corn: Background] (providing charts for statistical analysis of corn production in United States). In addition to its use in corn-based ethanol, corn has many industrial uses, including synthetic coatings, wallboard, fiberglass, adhesives, and linoleum flooring. See Angelo, supra note 25, at 596; see also Michael Pollan, What's Eating America, SMITHSONIAN (June 15, 2006), http://michaelpollan.com/articles-archive/whats-eating-america/ (discussing Americans’ eating habits as related to corn).

\(^{49}\) See Corn: Background, supra note 48 (providing charts for statistical analysis of U.S. corn production); see also Angelo, supra note 25, at 598 (questioning U.S. reliance on corn).

\(^{50}\) Major Crops Grown in the United States, supra note 45 (making estimations as to human consumption of U.S. corn production). The term “directly” indicates corn as a food source, including corn chips, while “indirectly” includes corn by-products in foods, such as high fructose corn syrup. Id.


\(^{52}\) Compare USDA ERS, FEED OUTLOOK: DECEMBER 2012 (2012) [hereinafter FEED OUTLOOK], available at http://www.ers.usda.gov/ersDownloadHandler.ashx?file=/media/965805/dfs12l.pdf (identifying corn statistics for 2012), with Corn: Background, supra note 48 (ignoring amount of corn that goes unaccounted for or is unrecorded). Corn statistics are broken down into three categories: “food, seed and industrial (FSI); feed and residual; and exports.” Alan Brugler, A Look at Feed, Residual Use, RDF-TV.COM (Sept. 30, 2011), http://www.dtnprogressivefarmer .com/dtn/tag/view/ag/printedPage.do;ID=NEWS_PRINTABLE_PAGE&bypassCache=true&pageLayout=v4&vendorReference=1b86f128-ff0b-4ef5-b365-607270b90575_1317240326661&articleTitle=A+Look+at+Feed%2C+Residual+Use&editionName=DTNAgFreeSiteOnline (breaking down how corn statistics are computed).

\(^{53}\) Corn Feed Seed and Industrial Uses Table 31, USDA ERS (2012), http://www .ers.usda.gov/datafiles/Feed_Grains_Yearbook_Tables/Corn_Feed_Seed_and_In dustrial_Uses/FGYearbookTable31Full.htm (providing statistics surrounding corn’s industrial uses). Notably, of all the corn used in ethanol production, approximately one-third of it returns to the animal feed market. David W. Kreutzer, Renewable Fuel Standard, Ethanol Use, and Corn Prices, HERITAGE FOUNDATION (Sept. 17, 2012), http://www.heritage.org/research/reports/2012/09/the-renewable-

http://digitalcommons.law.villanova.edu/elj/vol25/iss1/8
predominant “consumers” of U.S. corn production: food-like products, animal feed, and corn-based ethanol.\textsuperscript{54}

A. Food-Like Products

Prior to the corn industry’s takeover of U.S. agriculture, the nation most dependent on this starchy crop was Mexico.\textsuperscript{55} Yet today, when researchers compared the presence of corn in Americans’ diets to that in Mexicans’ diets, studies indicate that Americans are more accurately described as “the Corn People.”\textsuperscript{56} Americans stole this glamorous depiction as corn’s disciples due to the lack of one basic concept: variation.\textsuperscript{57} Mexicans consume a variety of foods, while many Americans do not.\textsuperscript{58}

As corn production increased in the 1970s, farmers sought ways to keep up production momentum by creating “new corn-intensive products.”\textsuperscript{59} Increasing corn consumption was critical to the continued growth of the corn industry, which had a limited consumer market given that each American consumer typically eats less than one bushel of white or sweet corn in a traditional format each year.\textsuperscript{60} By developing new uses for corn, corn producers al-

\textsuperscript{54} For a discussion of “Food-Like Products,” see infra notes 55-79 accompanying text. For a discussion of animal feed, see infra notes 80-93 and accompanying text. For a discussion of corn-based ethanol, see infra notes 94-108 and accompanying text. For an examination of the environmental impacts and negative health effects of these uses, see infra notes 112-156 and accompanying text.

\textsuperscript{55} POLLAN, supra note 2, at 19 (identifying historical presence of corn in diets).

\textsuperscript{56} Id. at 22-23 (discussing rise of corn’s presence in U.S. diet). When corn is consumed in large quantities, either directly or indirectly by eating animals predominately fed corn, an individual’s flesh shows a greater presence of carbon 13, which is easily recognizable to researchers and scientists. See id. at 22-23.

\textsuperscript{57} See id. (distinguishing foods that lessen Mexico’s reliance on corn in their diets: grass-fed beef, legumes, and cane sugar).

\textsuperscript{58} See id. (discussing difference in eating habits between United States and Mexico).


\textsuperscript{60} See POLLAN, supra note 2, at 85 (describing processing plant that breaks corn kernels into its component parts to be reconfigured into food-like products).
allowed American eaters to consume greater amounts of corn every year in non-traditional formats.61

While food-like products may be edible, they are differentiated from traditional food items due to the significant amount of processing such products require, despite the lack of a federal definition of food.62-63 Moreover, the questionable nutritional values of some food-like products push the envelope as to whether they should be labeled as food.63 The most prevalent product emerging from corn producers' brainstorming efforts is high fructose corn syrup.64 Today, this newly minted corn byproduct has found its way into nearly every processed food imaginable.65 It is estimated that "[t]he average American consumes over [forty] pounds of high-fructose corn syrup every year," when in 1975 the product "was not even a part of the [American] diet."66 Moreover, according to the USDA, Americans' use of corn sweeteners increased eightfold between 1950 and 2000, from eleven pounds per capita in 1950 to 85.3 pounds per capita in 2000.67

61. See id. (describing hidden ways in which Americans consume corn).
64. See Powers, supra note 59, at 679 (discussing new uses for corn production). High-fructose corn syrup is a cheap substitute for sugar found in many processed foods. See Paul Roberts, The End of Food 117 (Mariner Books 2009). It is a blend of glucose (corn syrup) and fructose, which along with sucrose (granulated table sugar), "brown sugar, molasses, fruit nectar, cane juice, honey and agave nectar," is labeled as "added sugars" by the FDA. Warshaw, supra note 63 (discussing differences between sugar and high fructose corn syrup). "Sugars" are those sugars that occur naturally in foods, such as sucrose from fruit or lactose from milk. Id.
65. See, e.g., Angelo, supra note 25, at 593 (detailing processed foods). For a discussion of the link between high fructose corn syrup and health effects such as obesity and diabetes, see infra notes 144-156 and accompanying text.
66. Purdy & Salzman, supra note 4, at 10,852 (identifying increasing perils of overreliance on corn in U.S. food supply).
Corn has become so prevalent in the average American diet that it is wholly unrecognizable to its eater. While American consumers may not recognize the primacy of corn in their everyday diet, researchers focusing on food’s “molecular makeup” are able to determine corn’s dominance in the American diet; researchers have identified that corn “has a unique biochemistry that allows researchers to identify its signature as it passes through the food chain.” By tracing corn’s unique signature through various fast food items, researchers arrived at a simple conclusion: most food comes “back to corn.” Corn is used to recreate flavors destroyed when food is processed. It is a component of breads and crackers, acts as the starch for processed meats and hamburgers, serves as the hydrogenated oil used to replace butter in fillings and baked goods, and replaces cocoa butter in chocolate. If you have a barbeque and do not serve corn on the cob, corn is still a main ingredient in your meal. Corn is hidden in your hotdog, mustard, mayonnaise, soda, beer, salad dressing, and pickle relish, all as a complement to your corn-infused cheeseburger.

Researchers at Iowa State University’s Center for Crops Utilization Research broke down the methods by which corn is fractionated and converted into food ingredients. Only twenty-three items earn the privilege of being deemed “Whole Corn Products.” Every other item listed by the researchers is considered a “Fractionated Product” and includes condiments, meat products, baking ingredients, and the like. As of 2006, “of the more than 45,000 corn-based food as well as industrial products.


Roach, supra note 68 (describing analytical methods used by researchers to identify corn in common foods).

Id. (quoting lead researcher on project, Hope Jahren).

See Roberts, supra note 64, at 46 (discussing modern food manufacturing).

See id. (discussing ways in which cheap commodities, such as corn, are reimagined into modern food products).

See Pollan, supra note 2, at 18. (discussing abundance of corn in supermarket products).

See id. at 18-19 (discussing use of corn in majority of grocery store items).


Id. (identifying corn tortillas, baby corn, canned corn, popcorn, and corn nuts, among others as “Whole Corn Products”).

See id. (identifying those food products created by fractioning process).
thousand items found in the average American supermarket, more than one quarter contain[ed some form of] corn.” 78 In 2012, Richard Volpe, a research economist with the USDA’s Economic Research Service, reported that corn’s presence in supermarket foods had increased to include seventy-four percent of processed products. 79

B. Animal Feed

While human consumption may be idealized as the traditional market for corn production, animals consume nearly four times as much corn as humans every year. 80 Yet this consumption pattern is a modern trend; historically, ranchers grazed cattle and other livestock on fields where grass, rather than corn, provided the basis of the animals’ diets. 81 As American corn farmers flooded food markets with their product to take advantage of the government subsidies and policies that artificially deflated the price of corn for consumers, the price of corn became so low that ranchers moved their livestock from farms to feedlots, replaced grass with corn, and spurred the expansion of corn consumption by animals, particularly livestock. 82 Following this transition from field to feedlot, more than ninety percent of animal feed is now corn-based. 83 The falling price of grain allowed ranchers to put their herds virtually anywhere and capitalize on the promise of cheap feed. 84

In addition to instant cost reduction benefits gained from the switch to corn-based feed, the increased efficiency of feedlots pro-

78. Angelo, supra note 25, at 596 (citing POLLAN, supra note 2, at 19) (indicating prevalence of corn in standard supermarket products).
80. Compare FEED OUTLOOK, supra note 52 (identifying corn statistics for 2012), with Corn: Background, supra note 48 (ignoring amount of corn that goes unaccounted for or is unrecorded).
81. See Angelo, supra note 25, at 606 (discussing how livestock contribute to water quality degradation).
82. See ROBERTS, supra note 64, at 121-23 (identifying effects of government subsidies for corn on its production costs, output, and uses, including market growth in animal feed).
83. Compare FEED OUTLOOK, supra note 52 (providing statistical information for corn production), with Corn: Background, supra note 48 (providing background information regarding U.S. corn production).
84. See Angelo, supra note 25, at 606-07 (identifying transition in animal feed); see also Roberts, supra note 64, at 122-23 (addressing motivation for ranchers to move away from pasture grazing).
vided long-term value to ranchers. Grass-fed cattle can take nearly two years to reach sufficient slaughter weight, compared to less than a year for cattle on corn-based diets. Feedlots provide a quicker alternative to the traditional fattening process of grass, as it takes merely four months to fatten a “six-month-old five-hundred-pound feeder calf into a 1,350-pound, slaughter-ready steer” on a corn-based grain diet. The feedlot cow, however, requires seven pounds of feed to add one pound of weight and requires twenty pounds of feed to add a pound of saleable beef. Despite the substantial quantity of feed needed for a calf to reach slaughter weight, the increased efficiency that is achieved helps to explain why most livestock predominately subsist on corn and grain and traditional grass-fed beef is touted as “alternative.”

In 2000, prior to the ethanol boom, animal feed accounted for over fifty percent of U.S. corn production. Today, beef cattle, hogs, poultry, and dairy cattle all depend on corn in feedstock. Corn historically allocated to animal feed constituted much of the U.S. corn crop, however, animal feed’s market share of corn production has decreased steadily since 2007 while overall corn production increased. Despite this decreased demand, animals remain reliable customers for corn producers, annually consuming approximately forty percent of the United States’ corn yields.

C. Ethanol

In addition to the use of corn in animal feed, corn is also used in the production of biofuels. Ethanol is a clear, colorless liquid

85. See Roberts, supra note 64, at 209 (discussing perceived benefits of concentrated animal feedlots).
86. See id. (discussing efficiency of concentrated animal feedlots and inefficiency of cows themselves).
87. Id. at 206, 209 (discussing supply chain effects of high corn prices).
88. See id. at 209-10 (discussing inputs needed at modern feedlots).
89. Angelo, supra note 25, at 607 (discussing evolution of cattle feed); see also Pollan, supra note 62 (identifying increasing popularity of alternative food systems).
90. See Duffield et al., supra note 20, at 442 (discussing ethanol’s growth in production and thus its increasing demand for American corn supplies).
91. See id. at 444 (discussing potential negative aspects of increasing corn prices due to ethanol boom).
92. See generally Feed Outlook, supra note 52 (providing statistical information for corn production).
93. Compare id. (noting significant amount of corn is used for animal feed), with Corn: Background, supra note 48 (ignoring amounts of corn that go unaccounted for or unrecorded).
94. See, e.g., Womach et al., supra note 17, at 61-62 (discussing concerns surrounding increased biofuel production using agricultural products by highlighting...
produced from starch, sugar, or cellulosic-based feedstock that functions as a dynamic energy source. Ethanol fuels can be used to power vehicles traditionally using petroleum-based fuels, such as most U.S. vehicles. Thus, policymakers, regulators, and corn-industry enthusiasts promote corn-based ethanol as a possible solution to the United States’ gasoline dependence. Although nearly ninety percent of ethanol produced in the United States comes from corn, other potential ethanol sources include sugarcane, grass, wood, and crops residues.

Gasoline independence may be advantageous to U.S. drivers; however, corn-based ethanol requires 450 pounds of corn to fill just one sport utility vehicle’s fuel tank. The significant quantity of corn needed to produce corn-based ethanol necessitated that ethanol production would control nearly half of the nation’s corn crop in 2012. Yet, corn-based ethanol only accounts for eight percent of the United States’ annual gasoline usage.

To produce corn-based ethanol, corn is typically processed by one of two popular methods to convert corn into ethanol: dry mill...
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ing or wet milling. To produce corn-based ethanol through dry milling corn kernels are ground into flour and mixed with water and enzymes to create a dextrose mash. Processors then subject the dextrose mash to additional processing at high and then cool temperatures. The resulting mixture is then fermented and then processed again to separate the concentrated ethanol from the mixture's dehydrated solids. Conversely, when creating ethanol through wet milling, the corn is not ground into flour, but rather is broken down into its component parts to process into corn germ, fiber, gluten, and starch. The wet milling processes use only the starch from corn to produce ethanol through processes similar to the fermentation and distillation processes used in dry milling. Because corn-based ethanol demands a significant investment of financial resources, time, land, equipment, and additional inputs, many experts debate the ongoing viability of corn-based ethanol as an energy efficient alternative to gasoline.

IV. Don't See a Problem? Effects of Overreliance

The perceived benefits of increased corn production, new corn applications, and corn-based ethanol may be outweighed by the combined lasting, detrimental impacts from corn overreliance. Every American pays, both literally and figuratively, as the vegetable is manipulated into an over-produced industrial product no longer resembling a domestic food source. Americans suffer the effects of corn overreliance through: (A) the environmental effects of in-

102. Id. at 55 (describing traditional production processes for corn-based ethanol).
103. Id. (discussing ethanol production through dry milling process).
104. Id. (describing uses of temperature in ethanol production process).
105. Id. (differentiating ethanol production through dry milling process from process used in wet milling process).
106. Moland, supra note 101, at 55-56 (discussing ethanol production through wet milling process).
107. Id. (discussing similarities between final process of wet milling to fermentation and distillation processes used in dry milling).
108. See Natalie Jean Kurz, Comment, Corn Ethanol: Setting Straight a Misguided Attempt to Free the United States From Foreign Oil, 31 Hous. J. Int'l L. 377, 411 (Spring 2009) (discussing history of ethanol production in United States and related environmental abuses). Another major downside to corn-based ethanol is simply that ethanol from sugar, as it is produced in Brazil, is much more efficient. Id. at 387. Corn-based ethanol has a net energy value of 1.34, while ethanol from sugar cane has a net energy value of 8.3. See id. at 387 n.57.
109. See, e.g., Powers, supra note 59, at 682-83 (assessing foreseeable and unintended effects of corn-based ethanol).
110. See Eubanks, supra note 1, at 239-40 (warning Americans to remember costs associated with political ploys inherent in farm bills).
creased production; (B) the human health effects from overconsumption of corn products; (C) the animal health effects from corn consumption; (D) the environmental effects of ethanol production; and (E) the economic costs. 111

A. Environmental Effects of Increased Corn Production

Increased corn production can have major environmental impacts at the local level. 112 Such environmental impacts have increased in severity as the majority of domestic corn farming has morphed into an industrial process bearing little resemblance to the traditional image of farming. 113 In the United States, corn is produced, not grown. 114 Corn farming has transitioned from a labor and time intensive planting and growing ritual to an industrialized process involving water, chemicals, and fossil fuels, all of which adversely impact the surrounding environment’s water, land, ecosystem, and air quality as a side effect of the industry’s efforts to increase production output. 115 The farmers that Americans idealize immortalized by the tagline of conservative broadcaster Paul Harvey’s 1978 speech, “[s]o God made a farmer,” – those hard working, family-oriented individuals who provide sustenance for their families and the surrounding regions and who plant, monitor, and allow nature to control the growing process – have dwindled in number. 116 “Megafarms,” those farms operated by absent, large

111. For a discussion of the adverse effects of corn overproduction and over-reliance, see infra notes 112-224 and accompanying text.

112. See Powers, supra note 59, at 683 (providing overview of environmental impacts of corn production).

113. See Eubanks, supra note 1, at 252 (rejecting idea of corn farming as planting, sewing, and watering, instead identifying U.S. agriculture as industrialized farming system).

114. See id. (noting modern industrial farms substantially impact water, land, wildlife, and air quality, especially when compared to traditional rural farms circa 1950).

115. See id. at 252 (identifying how industrialized agriculture impacts local environments); see also Angelo, supra note 25, at 603 (discussing rise of industrial agriculture).

116. Compare Eubanks, supra note 1, at 228-29 (discussing government support for Megafarms), with Pollan, supra note 62 (discussing demise of regional farmers); see also Maria Godoy, ‘God Made a Farmer’ and the Super Bowl Made Him a Star, NPR.ORG (Feb. 04, 2013, 12:46 PM), http://www.npr.org/blogs/thesalt/2013/02/04/171056911/-god-made-a-farmer-and-the-super-bowl-made-him-a-star (discussing Dodge Ram’s 2013 Super Bowl commercial with voiceovers by Paul Harvey highlighting importance of farmers in United States). Paul Harvey was a conservative broadcaster whose speech to the Future Farmers of America in 1978 emphasizing the hard work, ethics, and virtues of American farmers was used in a 2013 Super Bowl commercial and is commonly quoted for the tagline “[s]o God made a farmer.” Id.
corporations that receive a substantial portion of government subsidies, have made it so that smaller, traditional farms can no longer remain competitive.\textsuperscript{117} Thus, much of U.S. farming has become the process of “driving and spraying,” as opposed to the labor intensive, hands-on approach of the United States’ agrarian past.\textsuperscript{118} The United States’ new-age “farmers” have transformed corn farming into a high yield hybridized industrialized system.\textsuperscript{119} This industrialization strains water resources and uses massive amounts of fossil fuel inputs such as fertilizer, herbicides, and pesticides in order to produce these high yields.\textsuperscript{120}

Admittedly, while all agricultural production has the capacity to impact water resources adversely, industrial agriculture, with its large-scale operations and single-minded focus on high yield production, “requires water-intensive agricultural practices that depend on large-scale irrigation.”\textsuperscript{121} Agricultural irrigation is the largest user of freshwater resources, and it accounts for more than a third of the nation’s daily water usage, drawing over 135 billion gallons daily from the United States’ freshwater resources.\textsuperscript{122} The strain on water resources is further complicated by the fact that corn is often produced in areas of the country lacking sufficient water sources to support increasing acreage and corn’s high demand for water.\textsuperscript{123} Accordingly, water must be physically transported to areas naturally unsuitable for this overproduction, making industrial agricultural, and subsequently corn overproduction, a point of contention in water disputes nationwide.\textsuperscript{124}

To produce high crop yields, industrial agriculture “use[s] a volatile cocktail of toxic chemical fertilizers,” and arguably, hybrid

\textsuperscript{117.} Eubanks, \textit{supra} note 1, at 230-34 (discussing evolution of Megafarms); \textit{see also} Angelo, \textit{supra} note 25, at 602 (addressing replacement of human labor with commodity farming performed by machines).

\textsuperscript{118.} Pollan, \textit{supra} note 62 (discussing loss of United States’ rural farmers to urban factories and modern stigmatization and devaluation of farming as occupation).

\textsuperscript{119.} Eubanks, \textit{supra} note 1, at 252 (discussing evolution of U.S. farming practices into industrialized processes).

\textsuperscript{120.} Angelo, \textit{supra} note 25, at 602 (discussing requirements of industrialized agriculture to sustain such high yield crops); Powers, \textit{supra} note 59, at 683 (identifying environmental effects of overproduction).

\textsuperscript{121.} Angelo, \textit{supra} note 25, at 603 (addressing effects of industrial agriculture on water sources’ quality and quantity in United States).

\textsuperscript{122.} Eubanks, \textit{supra} note 1, at 253 (identifying effects of commodity agriculture on U.S. water resources). The amount of water usage includes 5.6 cubic miles of water withdrawn from rivers and aquifers every year. \textit{See} Foley, \textit{supra} note 5.

\textsuperscript{123.} \textit{See} Eubanks, \textit{supra} note 1, at 254 (discussing diversion of freshwater resources to commodity crop locations).

\textsuperscript{124.} \textit{See id.} (discussing impact of commodity crops on water quantities).
corn is the greediest, most fertilizer-needy crop.\textsuperscript{125} The crop fertilizers used were developed by researchers following World War II with the government’s leftover ammonium nitrate—a chemical previously used to create explosives.\textsuperscript{126} Using ammonium nitrate in this way is ideal because the chemical contains significant amounts of nitrogen, which is critical for crop growth and survival.\textsuperscript{127} Redeploying this former weapon-producing element into a chemical crop fertilizer allowed U.S. farmers to increase crop yields at unprecedented rates.\textsuperscript{128} Such high yields are achieved because “over 5.6 million tons of nitrogen is applied to corn each year through chemical fertilizers.”\textsuperscript{129} Multiplying the effect of the fertilizers, corn producers also use more herbicides and insecticides than any other crop.\textsuperscript{130} Overall, “[c]orn receives about [thirty-five] percent of all agricultural pesticides and [forty] percent of all commercial fertilizer used in the U.S.”\textsuperscript{131}

Therefore, not only does increased corn production strain the demand for the United States’ water resources by diverting needed water from its intended localities, but also the added inputs negatively affect water quality.\textsuperscript{132} The ammonium nitrate and phosphorus found in fertilizer is often transported by rain runoff into streams, lakes, and rivers.\textsuperscript{133} This chemical runoff pollutes waterways and encourages the growth of algae, which can deplete available oxygen and block sunlight.\textsuperscript{134} Excessive algae can dominate and destroy an ecosystem by causing a “dead zone,” which is typically characterized by a reduction in both the population of fish...
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and aquatic organism productivity. Exemplifying the effects of chemical runoff, atrazine, a herbicide used on industrial corn, has polluted waterways throughout the Midwest and is linked to hermaphroditism in frogs and other amphibians. Moreover, chemical inputs, such as fertilizer, pesticides, and herbicides, often runoff into ground and surface water, contaminating these water sources in a way that makes them unacceptable for human consumption.

These chemical inputs are also capable of destroying topsoil through erosion. Soil erosion from chemical application is exacerbated by farmers' dedication of farmland to single crop production as a result of policies that discourage crop diversity and perennials. The impact of chemical-caused erosion due to crop overproduction is twofold: first, sediment runoff carries fertilizers and pesticides into water systems, and second, the erosion of topsoil releases carbon dioxide into the air.

Notwithstanding the potential adverse effects of fertilizers used in corn production on water resources, the creation of these fertilizers requires an immense amount of heat and pressure, often supplied by fossil fuels. Considering corn production holistically, including its planting, equipment, fertilizers, and transportation, "more fossil fuel energy is required to grow and harvest the corn

135. Id. at 605-08 (discussing downstream effects of chemical fertilizer runoff that can create dead zones through upsurges in algae, causing drops in oxygen and death of plant life). For example, chemical runoff from the "Mississippi River is believed to have caused a dead zone in the Gulf of Mexico." Id.

136. Powers, supra note 59, at 684 (discussing localized impacts of increased corn production).

137. Angelo, supra note 25, at 605-06 (discussing degradation of water quality due to industrial agriculture).


139. See Eubanks, supra note 1, at 261 (identifying effects of industrial agriculture on land and soil).

140. Id. at 261-63 (discussing effect of industrial tilling of soil). The release of carbon dioxide from soil erosion and tillage occurs when soil that has absorbed and stored carbon dioxide is exposed to oxygen, allowing the organic matter in the soil to decompose and release carbon dioxide into the air. See id. at 263. Carbon dioxide emissions from soil erosion are part of a larger carbon dioxide issue associated with industrial agriculture. Id. As discussed infra in notes 141-143 and accompanying text, industrial agriculture requires massive amounts of fossil fuels. Climate costs associated with "fossil fuel dependent agriculture" include the factor that "agriculture now accounts for [fifteen percent] of worldwide greenhouse gas emissions, while specifically accounting for almost [twenty-five percent] of carbon dioxide emissions and approximately two-thirds of both methane and nitrous oxide emissions in the United States." Eubanks, supra note 1, at 270.

141. See Pollan, supra note 48 (discussing evolution of chemical fertilizers).
than is actually gained from the end product itself." The negative environmental effects of these additional, indirect inputs range from depletion of water resources, deterioration of water quality, and increasing topsoil erosion and call into question the continued viability of increasing corn production.

B. Human Health Effects

Based on corn's position as the foundation of the United States' food supply, Americans are aptly recognized as the "corn people." This distinction has consequences, as overreliance on industrial corn in the form of empty calories and processed food products makes its mark on the health and wellness of Americans. Corn itself is not the problem, for when humans consume corn directly, such as in the form of corn-on-the-cob, they retain nearly all the vegetable's stored energy. Conversely, when humans consume corn indirectly, through corn-based products, they retain only ten percent of the energy present in corn prior to its harvest. High fructose corn syrup, for example, provides plenty of calories, but lacks nutritional value.

The government incentives that promote commodity crops in the 2008 Farm Bill distort the United States' food system by creating a food industry based largely on corn and its similarly cheap soybean counterpart, while simultaneously reducing the availability of healthy food options. By subsidizing only select commodity crops, "public policy encourages obesity at the expense of sound nutritional practices [because it compels] farmers to ignore other crops such as fruits, vegetables, and other grains." Current subsi-
dies allow many corn-based products, including processed foods, to sell at prices lower than comparatively healthier, more nutritional unsubsidized options such as fruits, vegetables, and whole grains, making subsidized foods more accessible than non-subsidized, healthy alternatives.\textsuperscript{151}

Today, Americans consume an additional 700 calories per day than they did in 1980, most likely due to diets high in both calories and fats and lower-cost processed foods readily available in grocery stores.\textsuperscript{152} Increased caloric intake is a critical social issue, as obesity in the United States reaches epidemic proportions.\textsuperscript{153} The direct health implications of obesity and the threat of obesity-related illnesses caused by modern diet trends has substantial consequences both for the individual and the financial reality of the health care system.\textsuperscript{154} Out of the top ten causes of death, four – heart disease, stroke, type two diabetes, and cancer – are chronic diseases that can be linked to diet.\textsuperscript{155} Spending on healthcare has increased from five to sixteen percent of the national income to combat the greater incidence of illness, while the average U.S. household’s spending on food has decreased from eighteen to less than ten percent of its annual income.\textsuperscript{156}

C. Negative Effects of Animals’ Corn-Based Diets

Corn-fed beef has become commonplace; however, overfeeding cattle with large quantities of corn is inherently unnatural for an animal biologically predisposed to subsist on grass.\textsuperscript{157} Cattle

\textsuperscript{151.} See id. at 280-82 (discussing commodity crops’ effect on healthy food availability in local grocery stores and comparative higher prices over subsidized corn-based products). The effect of commodity crop subsidies on consumer prices and consumer preferences is demonstrated by statistics showing that between 1985 and 2000 consumer prices for fruits and vegetables increased by forty percent, while the cost of soda, sweetened with high fructose corn syrup instead of cane sugar, fell by twenty-five percent. \textit{Id.}

\textsuperscript{152.} \textit{Id.} at 284 (discussing effects of commodity agriculture on obesity).

\textsuperscript{153.} See \textit{id.} (discussing America’s obesity problem). If an individual is labeled clinically overweight, it does not mean the individual is considered medically obese. See \textit{id.} An individual is medically obese when body weight exceeds body type projections by over 100 pounds or greater. See \textit{id.}

\textsuperscript{154.} See Eubanks, \textit{supra} note 1, at 289 (discussing health complications of obesity).

\textsuperscript{155.} See Pollan, \textit{supra} note 62 (highlighting potential issues for President Obama’s first term in office).

\textsuperscript{156.} \textit{Id.} (linking rising healthcare costs with decreasing spending on healthy food).

\textsuperscript{157.} POLLAN, \textit{supra} note 2, at 67-68, 75, 81 (identifying harmful effects to cattle from corn diet instead of grass).
forced to eat corn are susceptible to entirely new and different diseases traceable, either directly or indirectly, to the animal’s corn-based diet.\textsuperscript{158} To combat these new diseases, farmers intentionally fattening cattle by feeding them thirty-two pounds of corn a day inject the same cattle with antibiotics to deter acidosis, diarrhea, bloat, liver disease, pneumonia, and polio.\textsuperscript{159} Thus, a precarious pattern emerges: farmers feed grass-needy cattle an abundance of corn to make them fat, and when the cattle becomes sick, farmers inject the cattle with prescription medicines as opposed to treating the underlying culprit that is the cause of the cattle’s ailments – corn.\textsuperscript{160}

Moreover, the concentration of cattle in feedlots creates serious environmental concerns.\textsuperscript{161} Generally, cow manure acts as a natural fertilizer for crops; however, cow manure from feedlots is “practically toxic.”\textsuperscript{162} The high levels of nitrogen and phosphorus in feedlot manure could potentially kill the crops it is intended to fertilize.\textsuperscript{163} Moreover, the presence of chemicals, heavy metals, and hormone residues in feedlot manure have transformed the once natural fertilizer into a toxic waste product with the ability to infiltrate and pollute local and downstream water sources.\textsuperscript{164} The toxic manure may also contain a bacterium, that if improperly sterilized, could pass along adverse health consequences to the ultimate consumer of the meat products.\textsuperscript{165}

Other animals that now depend on corn for feed, such as chickens and pigs, have adapted far better to their new corn diets than cows.\textsuperscript{166} Still, transitioning these animals to starchy feed-based

\textsuperscript{158.} Id. at 77-78 (indicating types of health effects common to confined cattle in feedlots).

\textsuperscript{159.} Id. at 74, 78 (discussing health issues faced by animals in feedlots).

\textsuperscript{160.} Id. at 79 (identifying health issues faced by animals in feedlots and noting farmers medically treat those illness rather than address their underlying causes).

\textsuperscript{161.} See id. at 79-84 (discussing livestock waste).

\textsuperscript{162.} Pollan, supra note 2, at 70, 84 (identifying cattle’s dependent relationship with substantial use of farmland, and also indicating presence of unnatural elements in feedlot waste based on current living and feeding patterns ruin otherwise ideal natural fertilizer).

\textsuperscript{163.} Id. at 79 (discussing potential dangers found in livestock manure).

\textsuperscript{164.} See id. (discussing unnatural additives found in manure at feedlots and their effect on nearby water supplies).

\textsuperscript{165.} See id. (discussing unnatural additives found in manure at feedlots and their potential effects on beef consumers).

\textsuperscript{166.} Id. at 68 (indicating that although other animals have also been transitioned to corn-based diets they have not faced such severe consequences as livestock).
diets did cause initial nutritional problems. Protein starved chickens turned cannibalistic, "eating one another's feathers, or worse . . . until farmers began supplementing grain with protein rich soybeans and amino acids, along with bone meal, blood, offal, and other protein-rich waste products from slaughterhouses." Such practices are the exception to the Food and Drug Administration's (FDA) ban on feeding ruminant proteins to livestock. When examining all the efforts researchers, ranchers, and politicians have taken to alter, adapt, and streamline animals' consumption habits, it becomes clear that what was once the solution to corn surpluses is now a serious problem affecting animal health.

D. Environmental Effects of Corn-Based Ethanol Production

Due to the amount of congressional support for corn-based ethanol, its production in the United States will continue to grow despite convincing evidence that corn-based ethanol's environmental effects are more harmful than anticipated. It is because of these harmful effects that this production process is not without its critics. Corn-based ethanol's challengers often attack its claimed efficiency by highlighting that ethanol "produces less energy per gallon than gasoline." For example, fuel that contains eighty-five percent ethanol and fifteen percent gasoline, E85, may contain thirty percent less energy by volume than traditional gasoline. A Department of Energy report indicated that the use of E85 and corn-based ethanol, as opposed to traditional gasoline, could result

167. See Roberts, supra note 64, at 24 (discussing evolution of our modern food economy).
168. Id. (discussing change in animal's nutritional diet when switch was made to starch).
169. Pollan, supra note 2, at 74 (discussing federal regulation of animal feed contents).
170. See id. at 82 (analyzing purpose of federal regulation of animal feed contents).
171. See Powers, supra note 59, at 682 (discussing unintended consequences of ethanol on environmental resources, air quality, and wildlife habitats). Although the number of ethanol production facilities in the United States is declining, ethanol production in 2013 is projected to increase. EPA Continues Ethanol Push, supra note 29 (discussing EPA's ethanol projections for 2013).
172. See Volinski, supra note 95, at 513-14 (suggesting specific arguments to combat corn-based ethanol enthusiasts' claims that it promotes energy independence, environmental welfare, and has agricultural benefits).
173. Id. at 515 (analyzing corn-based ethanol's inefficiency claims).
174. Id. (indicating E85's high octane rating is useless in newer vehicles not compatible with E85).
in a twenty-five to thirty percent reduction in vehicle fuel efficiency based on the number of miles driven. 175

Another criticism of corn-based ethanol is that it does not avoid the costs of using non-renewable resources. 176 Proponents of this line of reasoning point out the "non-renewable energy required to grow and convert corn into ethanol is greater than the energy value present in the ethanol fuel." 177 Simply, "[i]t takes a lot of energy from methane, oil, and coal to produce corn, and even more fossil energy to convert the corn feedstock into ethanol." 178

Researchers estimate that of the fossil fuels used in corn-based ethanol production, thirty percent are expended in planting, growing, and harvesting corn. 179 This figure includes the fossil fuels needed both to run the farm equipment and to produce fertilizers and pesticides. 180 The other seventy percent of fossil fuel expenditures are used in the creation of corn-based ethanol when the corn’s starch is processed. 181

Ethanol is inherently corrosive and has the ability to precipitate water; therefore, it must be transported by fossil fuel intensive methods such as by truck, rail, or ship, rather than by pipeline. 182 Ethanol’s demanding transportation needs further diminish claims that corn-based ethanol is an environmentally friendly alternative to the United States’ oil dependency. 183 In all, independent ethanol studies indicate corn-based ethanol production requires twenty-

175. Id. at 514-15 (defining E85 and describing inefficiency claims).
176. See id. (discussing corn-based ethanol’s net energy benefit according to studies performed by USDA and independent, non-government funded scientists who achieve different results based on fossil fuel inputs needed in corn-based ethanol’s manufacturing process).
179. Mann & Hymel, supra note 30, at 68 (discussing net energy effects of corn-based ethanol production).
180. Id. (describing fossil fuel consumption used in ethanol production process).
181. Id. at 69 (identifying various fossil fuel inputs in ethanol production which decrease ethanol’s claim that it is energy efficient).
182. See id. (identifying various fossil fuel inputs used in calculating net energy benefit of corn-based ethanol).
183. See id. (discussing fossil fuel inputs needed in corn ethanol production).
nine percent more fossil fuel energy than corn-based ethanol creates.\(^{184}\)

Corn-based ethanol also has a significant environmental impact given the amount of water needed for ethanol's production.\(^{185}\) Compounding to the strain on water resources from increased corn production discussed previously, the process of producing ethanol requires multiple gallons of water per gallon of ethanol produced.\(^{186}\) Ethanol production facilities capable of producing one hundred million gallons of ethanol a year use as much water as a town of five thousand people annually.\(^{187}\) Ethanol's inefficiency when compared to traditional gasoline, its negative net energy benefit, and the strain its production places on water resources impute environmental consequences on Americans without fulfilling the promise of ethanol as the means to achieving energy independence.\(^{188}\)

E. Community Costs

Government intervention in agricultural markets is common as administrations attempt to stabilize traditionally volatile food markets.\(^{189}\) This volatility is due not only to external factors such as crop failures and drought, but also to fluctuation in farmers' planting each year.\(^{190}\) High crop prices in one year lead farmers to increase production the next year to capitalize on those higher prices.\(^{191}\) This trend evidences that "[f]armers themselves [are]
simply too prone to overproduction." When farmers overproduce, prices fall. While the government often intervenes to combat farmers’ own tendencies to overproduce, recent agricultural policies have not quelled farmers’ overproduction; rather, they have incentivized it.

Government intervention in the corn industry extends into the automotive and sustainable energy industries as well. In 2005, Congress amplified its support for alternative and renewable fuels by adopting the 2005 Energy Policy. As part of this comprehensive policy, Congress developed the first federal Renewable Fuel Standard (RFS) requiring gasoline importers, blenders, and refiners to include biofuels in gasoline in predetermined increments that increase every year. Initially, the biofuel blending requirements were minimal, but because of the surprising success of the standard, Congress increased the blending requirement from 7.5 billion gallons by 2012 to at least 36 billion gallons of biofuels blended into gasoline by 2022.

The congressional scheme designed to support the corn-based ethanol industry fiscally through tax credits and subsidies amounts to billions of dollars every year. The ethanol industry has received tax-credits totaling over six billion dollars, and it is by far the largest single recipient of renewable energy funds. In addition, Congress authorized an import tax of fifty-four cents per gallon on imported ethanol, which was aimed at reducing the United States’ importation of Brazil’s sugar-based ethanol. Until recently, the total amount of tax credits and subsidies on every gallon of gasoline infused with the mandatory levels of ethanol ranged from $1.05 to

192. Id. (discussing grain market failures that led President Roosevelt to create price stabilizing tools).
193. Id. at 122 (discussing cycle of increasing output and falling prices).
194. See id. (discussing federal agricultural policies).
195. See Duffield et al., supra note 20, at 432-33 (identifying government intervention in energy markets by incentivizing use of corn).
196. See Powers, supra note 59, at 668 (discussing congressional support for biofuels).
197. Id. (discussing biofuels’ inclusion in gasoline). The term “biofuel” refers to any “fuel produced from biomass (except fossil fuels), such as plants, woody material, organic wastes, and the like.” Id. at 674.
198. Id. (discussing biofuels).
199. Id. at 680-81 (identifying complicated structure of tax credits, subsidies, import tariffs, and congressional mandates promoting ethanol use).
200. Hargreaves, supra note 97 (identifying distribution of federal funds among renewable energy industries).
201. Powers, supra note 59, at 681 (discussing congressional measures designed to increase dependence on American produced corn-based ethanol).
$1.38 per gallon.\textsuperscript{202} By combining domestic ethanol subsidies with the import tariff, the government’s effort to promote gasoline independence through corn-based ethanol actually “costs $120 more than every barrel of oil saved.”\textsuperscript{203} When these tax credits expired in 2011, ethanol producers commented that they had “voluntarily” allowed them to expire.\textsuperscript{204} However, by 2013, the producers’ attitude of congressional acquiescence ended as they vigorously lobbied against the threat of Brazilian sugar-based ethanol by requesting the cellulosic biofuels mandate be reduced.\textsuperscript{205}

U.S. taxpayers and consumers have also felt the effects of increased ethanol production through the rising cost of corn.\textsuperscript{206} Before Congress increased the demand for corn by incentivizing ethanol production, the world price for corn was falling steadily, reaching $1.85 a bushel in 2005.\textsuperscript{207} Not surprisingly, corn prices decreased as corn producers continued to saturate the market with too much corn.\textsuperscript{208} This artificially low price for corn was the result of farm policies that paid farmers the difference between their production costs, nearly three dollars a bushel, and the market price.\textsuperscript{209} Thus, Congress effectively incentivized overproduction and eliminated the need for farmers to respond to market changes by decreasing their production as corn prices fell.\textsuperscript{210}

As corn production increased in 2005 and pushed down the price of corn, the price of gasoline skyrocketed.\textsuperscript{211} Unfortunately for the majority of Americans, “[t]he perfect storm of high oil

\begin{itemize}
\item \textsuperscript{202} Id. (summarizing per gallon effect of governmental ethanol subsidies).
\item \textsuperscript{203} Id. (indicating cost of barrel of oil is $120 below amounts required to prevent each barrel’s acquisition).
\item \textsuperscript{204} Robert Pear, \textit{After Three Decades, Federal Tax Credit for Ethanol Expires}, N.Y. TIMES (Jan. 1, 2012), http://www.nytimes.com/2012/01/02/business/energy-environment/after-three-decades-federal-tax-credit-for-ethanol-expires.html?_r=0 (discussing expiration of ethanol tax credit).
\item \textsuperscript{205} See Ryan Tracy, \textit{U.S. Corn Ethanol Producers: Curb Imports From Brazil}, WALL ST. J. (Jan. 30, 2013, 11:49 AM), http://online.wsj.com/article/SB10001424127887234610504582783842341906004.html?KEYWORDS=ethanol (discussing shift in ethanol producer’s political endeavors from promoting corn-based ethanol to prohibiting sugar-based ethanol imports).
\item \textsuperscript{207} ROBERTS, \textit{supra} note 64, at 121 (discussing decline of market price for corn).
\item \textsuperscript{208} Id. (discussing fall of corn prices).
\item \textsuperscript{209} Id. (discussing government subsidies for corn production).
\item \textsuperscript{210} Id. (identifying congressional policies incentivizing overproduction).
\item \textsuperscript{211} See generally Dan Morgan, \textit{Senate Panel Votes to Boost Ethanol Mandate}, WASH. POST (May 26, 2005), http://www.washingtonpost.com/wp-dyn/content/publishing/
prices and record-breaking U.S. corn yields . . . allowed the powerful corn lobby to dictate many policies in the renewable energy debate."212 Once Congress passed the 2005 Energy Policy and the EPA promulgated the RFS mandating the inclusion of renewable fuels like ethanol in gasoline, the price of a bushel of corn rapidly increased.213

Although facially Congress mandated the use of corn-based ethanol "to help wean domestic dependence on foreign oil" behind the scenes, corn producers lobbied for the ethanol mandate to increase the market for corn.214 Congress then sweetened the deal for corn producers in an attempt to entice them to transition corn crops to ethanol production by creating an income tax credit of $0.51 for each gallon of ethanol blended into gasoline, in effect rewarding corn lobbyists' efforts.215

Although the United States' increasing use of ethanol benefits corn and ethanol producers, it presents numerous, measureable costs to U.S. consumers, beyond the negative impacts previously discussed.216 In 2007, the price of a bushel of corn reached nearly four dollars.217 By the time corn sold at $4.57 a bushel, ranchers who had moved their livestock to feedlots on the promise of cheap grain saw their break-even costs rise ten cents a pound above the market price for beef; translating into a $140 loss on each 1,350-pound steer.218 By 2008, corn prices peaked at nearly eight dollars a bushel before re-stabilizing at around four dollars – approxi-

article/2005/05/25/AR20050 52502048.html (discussing congressional decision to increase ethanol mandate in 2005).

212. Lore, supra note 130, at 53 (describing corn production's drain on United States' water resources).

213. Compare Roberts, supra note 64, at 121 (describing ethanol boom's negative effects on supply chains), with Volinski, supra note 95, at 512-13 (discussing changes to ethanol policy in United States with adoption of 2005 Energy Policy).


216. See Roberts, supra note 64, at 117 (indicating farmers saw cost of corn increase to such prices that feeding livestock each day now presents serious problems to bottom line).

217. Lowry La Seur et al., supra note 3, at 205 (addressing rising costs of corn).

218. Roberts, supra note 64, at 205 (discussing supply chain effects from increase in corn price).
mately double the historically stable price of two dollars a bushel.219 The drought in 2012 caused corn prices to rise well above eight dollars a bushel before settling into the new stable price of around six dollars a bushel.220 These cost changes ranchers face are ultimately passed down the food chain to U.S. consumers.221 As the price of corn climbs, so does the price of beef, milk, cereal, eggs, chicken, pork, and all other products that depend on corn.222 Since Congress increased the RFS mandate in 2007, food prices in the United States have risen twenty-eight percent faster than inflation.223 As the cost of food rises, the already low food budgets of U.S. households will be stretched thinner, especially considering rising consumer prices are no match for the federal support of ethanol.224

V. WHAT CAN WE DO?

For Americans, it seems not all is lost.225 Michael Pollan, a leading critic of the United States' food source deficiencies, believes the "twinned crises in food and energy are creating a political environment in which real reform of the food system may actually be possible."226 Alternative markets for food, including "organic,


221. See generally Rosenwald, supra note 219 (discussing trickle-down effects of higher corn prices).

222. Id. (identifying external impacts of higher corn prices).


225. See, e.g., Angelo, supra note 25, at 593-94 (describing recent events indicating public awareness is refocusing on current issues surrounding corn overproduction: rising food prices, climate change, health defects, and President and Mrs. Obama).

226. Pollan, supra note 62 (advocating use of current American crises as vehicle for changes needed on national scale).
local, pasture-based, [and] humane" treatment are thriving. Further, studies show diverse cropping systems can use fewer harmful additives while maintaining production and profitability. Reducing our dependence on corn is also possible if energy policies lower the ethanol mandate and encourage alternative energy resources, such as sugar-based ethanol or natural gas.

Moreover, if sustainability is truly a congressional goal, encouraging crop diversity will lessen the harsh environmental impacts of industrial agriculture while simultaneously reducing the amount of fossil fuels used in the farming process. Consumers need to become knowledgeable about the federal government's policies that control food and energy politics, make positive choices to lessen their dependence on corn-based products, voice their opinions against corn-based ethanol, and support those U.S. farmers utilizing sustainable practices without the benefit of federal subsidies.

A. Reform Food Markets

Undoubtedly the U.S. food market accomplishes exactly what it was developed to do: "produce cheap calories in great abundance." To make a difference, "food policy must strive to provide a healthful diet for all our people; this means focusing on the quality and diversity (and not merely the quantity) of the calories that American agriculture produces and American eaters consume." As Congress implements a new farm bill it should consider and support the message advanced by the USDA: Americans should fill their diets with an assortment of nutritious foods. As the majority of government crop subsidies go to industrial farmers producing corn, cotton, wheat, rice, and soybeans, there is a discon

227. Id. (identifying ways in which Americans are choosing alternative food sources).

228. Davis et al., Increasing Cropping System Diversity Balances Productivity, Profitability and Environmental Health, PLOS ONE (Oct. 10, 2012), http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0047149#abstract0 (studying potential of crop diversity to promote ecosystems and effects on farm profitability).

229. For a discussion of the need to diversify energy sources in the United States, see infra notes 242-261 and accompanying text.

230. For a discussion of the benefits achieved from crop diversification, see infra notes 262-278 and accompanying text.

231. For a discussion of possible ways to address America’s corn dependency problem, see infra notes 232-258 and accompanying text.

232. Pollan, supra note 62 (addressing potential for food market reform).

233. Id. (addressing potential for food market reform).

234. See Eubanks, supra note 1, at 300 (discussing joint implementation of farm bill between Congress and USDA, though conflicting messages exist for each).
connect between the USDA's message of eating healthily and the federal government's fiscal support for non-edible crops. This leaves farmers who provide the nation's fruits and vegetables to the masses unsupported and less price competitive.

Congress' first step to accomplishing real reform of the food system should be to make federal subsidies available to fruit and vegetable farmers and to stop penalizing current subsidy beneficiaries for growing specialty crops. Congress has the opportunity to create real change in U.S. food markets by increasing support and investment in local food systems such as farmers' markets and community-supported agriculture in order to increase consumer access to fruits and vegetables. If Congress promotes regional food sources, food could be fresher and more affordable because it is grown closer to home; thus, transportation costs would decrease, and certain foods would only be grown in season. Reforming the United States' food system does not guarantee Americans will be healthier, but policies encouraging the production of healthier foods and sustainable agricultural practices can act as a vehicle to promote a major change in American food culture. This will expand the conversation many Americans are already having about food safety, provenance, and healthy attributes.

235. See id. at 298-300 (examining California's agricultural practices where merely ten percent of farmers receive congressional support because they do not plant commodity crops).

236. See id. (suggesting Congress should remedy past practices of favoring commodity crops and provide subsidies to those farmers practicing sustainable agriculture and providing fruits, nuts, and vegetables by discussing farming practices in California as example of current agricultural policy deficiencies).

237. See Pollan, supra note 62 (discussing how federal policies can further improve food economy).


239. See Pollan, supra note 62 (identifying ways federal government can encourage regionalization of U.S. food system to promote healthier and more nutritional diets).

240. See Eubanks, supra note 1, at 307-08 (suggesting policy changes could influence U.S. diet). Sustainable agriculture, if supported by shifting government incentives, "will result in stronger, more competitive local food markets" instead of current food systems where fruit and vegetables are not widely available. Id. Further, more nutrient rich alternatives will become more affordable because fewer subsidies for corn-based products would equalize current price disparities. Id.

241. See Pollan, supra note 62 (discussing how federal policies and presidential examples can promote major changes in U.S. food culture).
B. Diversify Energy Sources

Corn-based ethanol cannot solve the United States' energy dependency problems on its own.242 Considering corn-based ethanol's known side effects, researchers doubt the practicality of its production playing any substantial role to increase energy independence.243 Instead of promoting a specific energy source, fuel, or technology, researchers urge the federal government to allow the market to "weed out the losers and cultivate the winners" of the United States' domestic energy supply.244 Moreover, recent events indicate Washington may be forced to consider the continued benefits of the United States' current ethanol agenda.245

In the fall of 2012, amid intense drought and high temperatures, the EPA refused to waive the RFS mandate because it was unable to conclude that the RFS was severely harming the economy.246 More than thirty-three senators and 150 members of the House of Representatives pleaded with the EPA to grant the RFS waiver due the hardships high corn prices were causing for their states.247 The EPA determined that although the drought created significant hardships for livestock producers, it had not severely impacted the national economy.248

At the same time, the EPA set impossibly high volume inclusion requirements for cellulosic biofuels in the RFS mandate.249 As part of the 2007 RFS, Congress specifically limited the amount of

242. See Duffield et al., supra note 20, at 451 (identifying necessary policy mechanisms needed to preserve growth in U.S. energy and agricultural sectors).
243. See Mann & Hymel, supra note 30, at 44, 78 (identifying ethanol production tax incentives and proposing changes to reduce U.S. dependence on corn ethanol).
244. Id. at 78-79 (proposing alternatives to corn ethanol production incentives).
247. Ethanol Fuel Mandate Loses Support, supra note 245 (describing members of Congress' request for EPA to waive RFS mandate in response to hardship caused by drought and high corn prices).
248. See EPA Decision to Deny Requests, supra note 246 (stating EPA's decision on request to waive ethanol mandate).
starch-based ethanol that counts toward alternative fuel targets set by the EPA each year. The limitation’s purpose was to promote the use of advanced biofuels, such as sugar-based ethanol and cellulosic biofuels. Technology growth for cellulosic biofuels, however, has been less than ideal, and in both 2011 and 2012, the cellulosic ethanol industry in the United States failed to produce a single gallon. As production sat at zero gallons per year, the EPA required billions of gallons of cellulosic biofuel to be blended into gasoline; when refiners failed to meet the requirements, the EPA forced refiners to buy tax credits. On January 25, 2013, the United States Court of Appeals for the District of Columbia struck down the EPA’s cellulosic biofuels mandate for 2012 as overly optimistic for failing to “take neutral aim at accuracy.” Disregarding the court of appeals’ pointed message, however, the EPA increased the advanced fuel mandate in 2013 to 2.75 billion gallons, requiring fourteen million gallons to come from cellulosic biofuel; that number is up from eight million in 2012.

The EPA’s continued dedication to the cultivation of corn-based ethanol in the United States is in stark contrast to the current political climate surrounding the issue. On February 12, 2013, President Obama declared that “no area holds more promise than our investments in American energy,” and that finally, the United States is positioned to be able to control its own energy future. In his 2013 State of the Union Address, President Obama indicated that natural gas “has led to cleaner power and greater energy inde-
President Obama's speech focused on renewable energy from wind and solar resources, while also mentioning oil and gas, yet he did not discuss ethanol. Additionally, President Obama encouraged support for natural gas through investments in research and technology to foster the industry's further growth. Likewise, congressional support for corn-based ethanol has fallen recently despite earlier commitments to its success, as Congress allowed the popular ethanol credit to expire in 2011 as a "special-interest giveaway the country could no longer afford."

C. Encourage Crop Diversification and Support

The United States' crop production is "characterized by low species and management diversity, high use of fossil energy and agrichemicals, and large negative impacts on the environment." Over eighty-four percent of current agricultural subsidy programs support only five crops: corn, cotton, wheat, rice, and soybeans. These limitations on the types of crops supported by the federal government encourage farmers to transition to single crop planting and simultaneously deter them from introducing non-commodity crops, perennials, and fallow seasons into planting routines.

Current agricultural policies treat farming and crop production as a prototypical American "industry" that must increase production while keeping costs down; yet, at its heart, farming is not an industrial process. Farming is "based on ecological principles and natural systems, which, if managed carefully, can be used to..."
promote rather than harm health."266 If federal policies encouraged a greater diversity of crops, there would be less of a "need for both fertilizers and pesticides" and help replenish the soil's natural nutrients, reduce the need for potentially harmful additives, and control soil erosion.267 Recent studies recognize that crop diversity can improve the "resilience of agricultural systems to climate change," making crops less susceptible to drought, high temperatures, and pests.268

Historically, U.S. farmers and Megafarms have responded to economic incentives and are willing to adopt new farming practices and techniques if encouraged by policy and the allure of favorable prices in the future.269 An eight-year study ending in 2011 found that crop diversification and the re-introduction of livestock to fields allowed farms to maintain high crop yields, suppress weed growth, and boost economic performance, while decreasing the need for chemical additives and reducing environmental impacts.270 The financial incentives for single crop production, however, create a barrier to any increase in crop diversification, as the advantages of single crop production for the income of the individual farmers override the national benefits achieved through diversification.271

Moreover, congressional attempts to incentivize diversity have not gone far enough.272 Consider the Environmental Quality Incentives Program (EQUIP) that mitigates environmental damage by creating flexible criteria for compliance waivers.273 EQUIP attempted to decrease industrial agriculture's environmental impacts

266. Id. (advocating for ways in which farm policy can promote health if regulated wisely and differentiating U.S. farming from other industries).

267. Pollan, supra note 62 (encouraging President Obama to address United States' food policies prior to his first term in office while comparing U.S. farming techniques to those utilized by alternative U.S. farmers and Argentinian farmers).


269. See id. at 190 (discussing how agricultural policy can encourage farmers to diversify crop cultivation to fend off climate change).

270. Davis et al., supra note 228 (discussing results of Marsden Farm Study conducted in United States' Corn Belt).

271. Lin, supra note 268, at 188 (discussing economic policy barriers to increased diversification among U.S. farmers).

272. See Eubanks, supra note 1, at 245 (identifying farm bill policies that encourage conservation).

273. See Pursell, supra note 265 (naming EQUIP as existing conservation program in 2008 Farm Bill capable of supporting integrated system of agriculture that "balance[s] health and long-term viability with a large-scale, highly productive commodity operation").
through this criterion by paying farmers to manage their nutrient inputs and outputs better. Yet, as a whole, conservation programs are underfunded, and any payments made are tied to subsidies that are distributed predominately to Mega farms.

To encourage crop diversity, Congress needs to incentivize sustainable farming practices adequately or stop inappropriately subsidizing non-sustainable practices. If crop subsidies are expanded beyond the five commodity crops, farmers will be able to plant additional crop varieties without being indirectly punished because of the lack of available subsidies for their efforts. Moreover, if Congress ties commodity crop subsidies to planting schedules, expressly requiring crop rotations and rest periods, farmers could react in order to preserve their subsidies.

D. Find a Powerful Advocate

Recently, Americans have developed a renewed interest in the food they consume. Leading the way, First Lady Michelle Obama helped to popularize the "locavore" movement by cultivating a vegetable garden in the heart of the United States' capital: on the White House's South Lawn. The White House Kitchen Garden has come to represent a symbolic cornerstone of many of the United States' contemporary societal issues: "[s]ustainable local agriculture, national farm policy, school gardens and, most of all, childhood nutrition and health." Michelle Obama's message, which is conveyed through the vegetable garden, is simple and

274. Compare id. (discussing opportunities for change in United States' current agricultural system), with Eubanks, supra note 1, at 244 (identifying advantages of EQUIP).

275. See Eubanks, supra note 1, at 245-49 (discussing failures of Farm Bill Conservation programs).

276. See id. at 295-96 (discussing potential for subsidizing sustainable agriculture practices).

277. See id. at 298 (discussing lack of federal subsidy support for fruit and vegetable farmers).

278. See generally UNION OF CONCERNED SCIENTISTS, supra note 238 (discussing policy incentives capable of overhauling United States' agricultural system).

279. See Angelo, supra note 36, at 593 (detailing increasing attention in U.S. food culture as promoted by Michael Pollan and First Lady Michelle Obama).

280. Id. at 594 (identifying public attention to food security).

straightforward: grow your own food and eat healthily.\textsuperscript{282} In part, her dedication to nutrition and healthy eating habits grew out of a common unawareness of the nutritional challenges Americans face with modern eating trends.\textsuperscript{283} Her own pre-existing bad habits — eating out frequently, sugary drinks, and not knowing the nutritional challenges her family faced — are analogous to Americans’ common blindness to the increasing presence of corn in our supermarkets and its infiltration into our food system.\textsuperscript{284}

Michelle Obama’s dedication to nutrition and health has made her a powerful political force and an impetus for nutritional reform.\textsuperscript{285} On December 13, 2010, President Obama signed the Healthy, Hunger-Free Kids Act of 2010 (Act), authorizing federal funding for improved school lunches, nutritional programs, and increased access to healthy food options for lower income children.\textsuperscript{286} Provisions of the Act included replacing junk food in schools with healthier alternatives and improving the nutritional quality of commodity foods.\textsuperscript{287}

Notably, an important take-away from this Act was President Obama’s remark in which he mentioned the consequences he would face if he did not sign the Act; Michelle Obama would have him sleeping on the couch.\textsuperscript{288} Michelle Obama was undoubtedly the driving force behind the Act, compelling its passage and securing the President’s seal of approval.\textsuperscript{289} President Obama pointedly reiterated Mrs. Obama’s powerful diplomatic force, noting that in
their disagreements, he "just concede[s] every point." This seemingly innocent Presidential confession, made wittily to Tonight Show host Jay Leno, presents the question: if Mrs. Obama asks for real reform of our nation's food system to reduce our dependence on corn, will President Obama listen?

The omnipresence of corn in the United States is directly linked to federal policies that prop-up corn producers. Although the United States' current First Lady has been instrumental in initiating the conversation about healthy eating and healthcare in political conversations, the Farm Bill, the Energy Bill, and U.S. food policies dictate what is grown in the United States and what is served at the table.

When Michael Pollan wrote a letter to then President-Elect Obama in 2008 stressing the reforms the United States' food system needed, perhaps he aimed for the wrong target. Perhaps the real force for change for the United States' overreliance on corn—which is destroying local environments, unnecessarily using large amounts of energy to produce inefficient ethanol, and making its way into nearly every processed food available at the supermarket—is not President Obama, but Michelle Obama. Mrs. Obama has continually shown her commitment to farmers markets, regional food sources, and healthy eating habits. As a catalyst for change, if Mrs. Obama took on the challenge of real agricultural reform to decrease our nation's reliance on commodity crops, corn in particular, she could further her message of healthy eating by starting at


291. For a discussion of President Obama's lighthearted approach to discussions with Mrs. Obama, see supra notes 288-291 and accompanying text.

292. See Lowry La Seur et al., supra note 3, at 204 (discussing effects of twinned policies on corn overproduction).

293. Compare id. (discussing importance of gardens and healthy eating), with Eubanks, supra note 1, at 214-16 (discussing larger, societal impacts of farm bills).

294. See Pollan, supra note 62 (addressing President-Elect Obama on food policy prior to his first term in office). Notably, Pollan highlights that food policy is not a subject to which many presidents have devoted substantial time. See id.


the source: the things we plant across our nation’s gardens, not just what she plants on the White House’s South Lawn. If Mrs. Obama took on this great challenge, it seems she would meet little to no resistance from the Man of the White House, per his fear of the couch.

VI. CONCLUSION

Nearly seven years after Michael Pollan so famously indicated that it all came back to corn, it is even clearer just how right he was. Together, U.S. agriculture and energy policies entrench Americans in a corn culture that is degrading human and animal health, damaging our environment, and costing consumers in taxes, food prices, and healthcare costs. As more and more of the United States’ corn production is allocated to corn-based ethanol, the facts surrounding its production show it does not serve the United States’ best interest in increasing energy independence as its net energy balance is questionable and its production has serious environmental effects, both from the increased corn production and the production of ethanol itself. As Americans wait for implementation of a new Farm Bill and the President shifts focus to natural gas, wind, and solar power as the United States’ energy solutions, legislators have the opportunity to set aside the United States’ corn dependency for the betterment of human health.

297. See John Kass, Diet Starts Tomorrow. Thanks, Michelle Obama, CHI. TRIB. (June 10, 2012), http://articles.chicagotribune.com/2012-06-10/news/ct-met-kass-0610-20120610_1_michelle-obama-push-ups-first-lady (discussing how Michelle Obama could really make a difference in healthy eating habits by addressing farm bills and agricultural policy). Compare Pollan, supra note 62 (discussing ability of President to act as national example for healthy eating by working closely with White House Chef and by planting vegetable garden at White House), with Higgins, supra note 281 (identifying social importance of Michelle Obama’s White House Vegetable Garden).

298. For a discussion of President Obama’s deferential approach to discussions with Michelle Obama, see supra notes 285-290 and accompanying text.

299. Pollan, supra note 2, at 18-19 (discussing presence of corn in processed foods which can be linked directly to corn). For a discussion on the pervasiveness of corn in the United States, see supra notes 45-108 and accompanying text.

300. For a discussion of the negatives effects of the United States’ corn addiction, see supra notes 109-224 and accompanying text.

301. See Mann & Hymel, supra note 30, at 79 (concluding corn-based ethanol does not serve United States’ best interests, and it is no longer wise policy to incentivize its production and use).
of animals, and the improvement and protection of our environment. 302

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302. For a discussion of the negative effects of the United States' corn dependency, see supra notes 109-224 and accompanying text.
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