

ONE TURKEY, SEVEN DRUMSTICKS: A LOOK AT GENETICALLY MODIFIED FOOD LABELING LAWS IN THE UNITED STATES AND THE EUROPEAN UNION

I. INTRODUCTION

If you want to know whether the lunch you eat exceeds the suggested daily caloric intake, or if it contains high fructose corn syrup, you simply read the label to find out.¹ If you would like to know if the food you are eating contains a genetically modified organism (GMO), however, you will not find that information on the package.² Currently, up to 80% of processed foods contain GMOs and with the American diet largely consisting of processed foods, chances are, a majority of what you are eating contains food made in a lab.³ In 2006, the United States became the world's largest producer of genetically engineered (GE) crops and while proponents argue that GE crops provide important benefits, such as increased crop yields and decreased pesticide usage, opponents claim that there are significant risks such as the transfer of genetically modified proteins to human cells.⁴

1. See U.S. DEP'T OF HEALTH AND HUMAN SERVS. ET AL., EATING HEALTHIER AND FEELING BETTER USING THE NUTRITION FACTS LABEL (2006), <http://www.fda.gov/downloads/Food/IngredientsPackagingLabeling/UCM275412.pdf> [hereinafter EATING HEALTHIER] (explaining information found on Nutrition Facts label).

2. See *About GE Food Labeling*, CTR. FOR FOOD SAFETY, <http://www.centerforfoodsafety.org/issues/976/ge-food-labeling/about-ge-labeling> (last visited Oct. 19, 2015) (noting labeling foods made with genetically modified organisms (GMO) not required by law). Companies that have eliminated GMOs from their ingredients can voluntarily add "Non-GMO" but face tight regulations and litigation challenges. *Id.* The European Union legally defines GMO as an organism whose "genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination." Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the Deliberate Release into the Environment of Genetically Modified Organisms and Repealing Council Directive 90/220/EEC, 2001 O.J. (L 106) 1, 4, http://www.biosafety.be/PDF/2001_18.pdf (defining GMOs).

3. See *GMO Facts Frequently Asked Questions*, NON-GMO PROJECT, <http://www.nongmoproject.org/learn-more/> (last visited Oct. 19, 2015) (stating prevalence of GMOs in food).

4. See *Countries Growing GMOs*, GMO COMPASS, http://www.gmo-compass.org/eng/agri_biotechnology/gmo_planting/142.countries_growing_gmos.html (last visited Oct. 19, 2015) (illustrating 54.6 million hectares of GMO crops in United States). The world's second leading producer of genetically engineered (GE) crops is Argentina, producing 18 million hectares in 2006. *Id.*

Despite consumer desire for GMO labeling, and the overwhelming amount of countries that require some type of regulation, the United States' Food and Drug Administration (FDA) decided almost twenty years ago that GMOs do not need to be labeled, reasoning that they were not "materially" different from other foods.⁵

GE plants have been strongly resisted in Europe, and in response to public fear and desire to abolish the growth and importation of GMOs, the European Union tried to ban the use of GMOs completely.⁶ The United States, Argentina, and Canada, however, challenged this ban at the World Trade Organization leaving the European Union to rely on strict processes and labeling regimes in order to control the domestic growth and importation of GMOs.⁷ The anti-GMO attitude of the European Union has spread, resulting in sixty-four countries' mandating GMO food labeling laws in place, while the United States lags behind.⁸ Currently, in the United States, more than seventy bills

5. See EATING HEALTHIER, *supra* note 1 (illustrating Food and Drug Administration's (FDA) lack of labeling); *Genetically Engineered Food Labeling Laws*, CTR. FOR FOOD SAFETY <http://www.centerforfoodsafety.org/ge-map/> (last visited Oct. 19, 2015) (showing through image more than sixty countries have enacted some sort of labeling laws); see also Food for Human Consumption and Animal Drugs, Feeds and Related Prods: Foods Derived from New Plant Varieties; Policy Statement, 22984, 57 Fed. Reg. 22,984 (May 29, 1992), available at <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Biotechnology/ucm096095.htm> [hereinafter Policy Statement 22984] (summarizing FDA policy on GMOs). Consumers must only be notified if a food is materially different, for example if a tomato has a peanut protein put into it, having the possibility of causing an allergic reaction to an unsuspecting but susceptible population, a label declaration is required. Policy Statement 22984, *supra*, at pt. 6 (indicating FDA criteria for labeling).

6. See Sylvia P. Onusic, *The Current Status of GMO's in Europe*, THE FARM-TO-CONSUMER LEGAL DEFENSE FUND (Sept. 19, 2012), <http://www.farmtoconsumer.org/blog/2012/09/19/the-current-status-of-gmos-in-europe/> (explaining European countries refused to take GMOs into their food chains).

7. See World Trade Org., *U.S. Sanctions Request in GMO Case Challenged by EC, Referred To Arbitration*, DISPUTE SETTLEMENT (Feb. 8, 2008), http://www.wto.org/english/news_e/news08_e/dsb_8feb08_e.htm (listing chronology of U.S. and E.U. dispute over GMOs). As a result of the United States' challenging its GMO ban, the European Union has one of the strictest systems in the world in place, requiring extensive testing and monitoring of crops. See Onusic, *supra* note 6 (discussing E.U. system currently in place).

8. See *International Labeling Laws*, CTR. FOR FOOD SAFETY, <http://www.centerforfoodsafety.org/issues/976/ge-food-labeling/international-labeling-laws> (last visited Oct. 19, 2015) (listing countries with GMO labeling laws). China's legislation attempts to balance agricultural GMOs with consumer and environmental safety concerns. Laney Zhang, *Restrictions on Genetically Modified Organisms: China*, THE LI-

have been introduced at the Federal level in over thirty states to either require GMO labeling or prohibit genetically engineered foods.⁹ This Note proposes a framework for establishing mandated labeling of GMOs in the United States as a result of comparing current state initiatives in comparison to the E.U. regime.¹⁰

Part II provides the history and development of biotechnology, addressing concerns regarding GMOs.¹¹ Part III discusses the effects of GMOs giving rise to mandatory labeling laws and rationale behind consumers' right to know what is in their food.¹² Part IV will examine the E.U.'s approach to regulating agricultural biotechnology in comparison to current food labeling laws in the United States.¹³ Part V will propose a labeling regime for the United States based on that of the European Union, which allows all states to have some form of GMO labeling law in place, through state police powers.¹⁴ Finally, this Note concludes with a discussion of potential issues, namely economic issues that companies may face due to inconsistencies nation-wide and a shift in consumer behavior away from GMOs, that could be the result of the proposed labeling regime led by individual states.¹⁵

BRARY OF CONGRESS pt. 5 (Mar. 2014), available at http://www.loc.gov/law/help/restrictions-on-gmos/china.php#_ftn7 (indicating China's labeling laws).

9. See *GE Food Labeling: States Take Action*, CTR. FOR FOOD SAFETY (June 2014), http://www.centerforfoodsafety.org/files/ge-state-labeling-fact-sheet-92014_02919.pdf [hereinafter *States Take Action*] (naming active legislation as of June 2014).

10. See *State Labeling Legislation Maps*, CTR. FOR FOOD SAFETY (June 6, 2014), http://salsa3.salsalabs.com/o/1881/p/salsa/web/common/public/content?content_item_KEY=13981 (listing active GE food labeling bills).

11. See *infra* Part II (discussing historical aspects of agricultural biotechnology).

12. See *infra* Part III (analyzing argument for GMO labeling laws).

13. See *infra* Part IV (detailing laws regarding GMO labeling in United States and European Union).

14. See *infra* Part V.A. (proposing regime requiring states enact GMO labeling laws). Health problems have increased since GMOs were introduced back in 1996. Jeffrey Smith, *10 Reasons to Avoid GMOs*, INSTITUTE FOR RESPONSIBLE TECH. (Aug. 25, 2011), <http://www.responsibletechnology.org/10-Reasons-to-Avoid-GMOs> (evidencing health issues related to GMOs). In the past nine years, from 1996 to 2011, the percentage of chronic illnesses among Americans has increased from 7% to 13%. *Id.* Not only have food allergies increased, but disorders such as autism, issues with digestion, and reproductive disorders are also rising since the development of GMOs. *Id.*

15. See *infra* Part V.B. (concluding in light of potential issues, United States should have GMO labeling laws).

II. HISTORY AND CONTROVERSY OF BIOTECHNOLOGY

For 10,000 years, farmers have been selecting and breeding desirable characteristics to improve plants and animals that are commonly used in crop and livestock agriculture.¹⁶ Biotechnology has developed in such a way that researchers can take one or more specific genes from any organism and introduce that gene into the genome of another organism.¹⁷ Scientists start by identifying a desired gene, then cutting that gene out of the DNA of an organism, copying the gene, adding other DNA to both ends of the copied gene, and introducing it to the cells of another organism, resulting in the production of new varieties of crops.¹⁸ As described above, the use of biotechnology through recombinant DNA has increased over time, as the first genetically engineered plant varieties were planted in the United States and Canada in 1990 and the first commercial release of such plant varieties was in 1992.¹⁹

Over the past two decades, there has been a vast increase in biotechnology and GE crop production which has left U.S. consumers' thinking that the new genes in their food are potentially allergenic or harmful to human cells.²⁰ The FDA is responsible for regulating the safety of foods, including GMOs, and has determined that as long as the final GMO is "materially" equivalent to its traditional form, it will be approved for human

16. See U.S. AGENCY FOR INT'L DEV. ET AL., BRIEF #1: WHAT IS AGRICULTURAL BIOTECHNOLOGY? (2004) (explaining historical ways of improving crops). "Agricultural biotechnology is a collection of scientific techniques used to improve plants, animals and microorganisms." *Id.*

17. See Ania Wieczorek, *History of Agricultural Biotechnology: How Crop Development Has Evolved*, THE NATURE EDUCATION KNOWLEDGE PROJECT (2012), <http://www.nature.com/scitable/knowledge/library/history-of-agricultural-biotechnology-how-crop-development-25885295> (explaining process of biotechnology). Organisms capable of gene introduction include plants, animals, bacteria, and viruses. *Id.* Although previously only obtainable through pig and cattle pancreatic glands, in 1978, insulin became the first commercial product to arise through biotechnology when scientists created synthetic insulin through transfer of genes. *Id.*

18. *Id.* (illustrating genetic engineering). Genetic engineering is defined as the process of "making changes directly to the DNA" of an organism. *Id.*

19. *Id.* (noting dates of biotechnology).

20. See Rick Blizzard, *Genetically Altered Foods: Hazard or Harmless?*, GALLUP (Aug. 12, 2003), <http://www.gallup.com/poll/9034/Genetically-Altered-Foods-Hazard-Harmless.aspx> (noting Americans' increasing concern about GMOs). The fate of genetically modified foods is ultimately in the hands of the public, which will all come down to the confidence in the overall safety of GMOs. *Id.*

consumption.²¹ GE crops, such as corn and potatoes, have been available for several years and currently the FDA is considering allowing Aqua Bounty Farms, a company that has genetically engineered salmon, to sell the first GE animal to the market.²² Although there are promotional claims that GMOs provide benefits, such as environmental precautions, greater crop yields, and higher nutritional values, these new food varieties nonetheless raise concern to consumers.²³

The most common concern among consumers is human health issues, as GMO opponents are circumspect of the possibility that introducing genetic traits into other organisms could be dangerous to consumers with food allergies.²⁴ Concerns of risks, such as hidden allergens, have led to consumers prominently pushing for labeling foods made with GMO ingredients.²⁵

21. See Policy Statement 22984, *supra* note 5, at pt. 6 (discussing FDA's stance on material equivalence); *FDA's Role in Regulating Safety of GE Foods*, U.S. FOOD & DRUG ADMIN. (May 14, 2013), <http://www.fda.gov/forconsumers/consumerupdates/ucm352067.htm> (stating FDA's responsibility for safety of GE foods). The FDA, to prevent consumer deception, stated that a food label is misleading if it omits "material" information. *So Why Has the FDA Not Acted?*, JUST LABEL IT!, <http://www.justlabelit.org/right-to-know-center/fda-ge-policy/> (last visited Jan. 4, 2015). [hereinafter JUST LABEL IT!] (indicating a consumer desire for labeling laws). The FDA issued a policy that defined "material" as the ability to be recognized by smell, sight, taste, and touch. *Id.* The FDA then determined that GMOs are equivalent to conventionally produced food and they were not materially different. *Id.* After twenty years, the FDA still views GMOs as materially equivalent, therefore not requiring labels. *Id.* For example, according to the FDA, a salmon that is genetically modified to produce hormones throughout the year does not taste, smell, or feel different so, therefore, it is not materially different from that of a non-GMO salmon. *Id.*

22. See JUST LABEL IT!, *supra* note 21 (explaining FDA's stance on GM salmon); see also Marian Burros, *Chefs Join Campaign Against Altered Fish*, N.Y. TIMES, Sept. 18, 2002 (explaining campaign in opposition of GE salmon). "[I]f genetically engineered salmon are approved by the Food and Drug Administration, they could escape from [their nets,] . . . interbreed with wild salmon [and] endanger[] some species." Burros, *supra*. GE salmon cause not only health concerns, but also an environmental concern amongst consumers. *Id.*

23. See Joshua Duvauchelle, *Pros & Cons of GMO Foods*, LIVESTRONG.COM, <http://www.livestrong.com/article/213053-pros-cons-of-gmo-foods/> (last updated Jan. 13, 2014) (listing pros and cons of GMOs).

24. See Roxanne Palmer, *GMO Health Risks: What the Scientific Evidence Says*, INT'L BUS. TIMES (Mar. 30, 2013, 3:42 PM), <http://www.ibtimes.com/gmo-health-risks-what-scientific-evidence-says-1161099> (analyzing major concerns arising from birth of GMOs); see also Julie A. Nordlee, et al., *Identification of a Brazil-Nut Allergen in Transgenic Soybeans*, 334 NEW ENG. J. MED. 688, 689-91 (1996), <http://www.nejm.org/doi/full/10.1056/NEJM199603143341103> (identifying possible allergic reaction to GM soybeans).

25. See *Genetically Engineered Foods May Cause Rising Food Allergies*, ORGANIC CONSUMERS ASS'N (May 1, 2007), <https://www.organicconsumers.org/news/ge->

Consumers' desiring to know what is in their food has resulted in over sixty countries' requiring some form of labeling when food is made with GMOs and more than twenty states have proposed legislation initiatives to require labeling, paving the way for states to model aspects of the E.U regime and require labeling of GMOs.²⁶

III. CONSUMERS' RIGHT TO KNOW: BASIS FOR LABELING LAWS

A. Health Safety

The increased risk of hidden allergens is one of the strongest reasons for labeling foods with GMOs, as studies have proven that food allergens are transferrable through genetic engineering.²⁷ Concerns regarding GE corn rapidly spread in 2013 when an author for the popular magazine ELLE wrote an article about the small change in the proteins of genetically modified corn "provoking a multisystemic disorder marked by the overproduction of a type of white blood cell called eosinophil."²⁸ After this vastly recognized magazine, that sells over

netically-engineered-foods-may-cause-rising-food-allergies (explaining scientists' claiming GM crops cause allergies). Genetic engineering may provoke increased allergies to soy and GM crops might create new allergies because of the production of a new protein that has not been present before. *Id.* See also *Label GMO Foods*, U.S. PIRGEDUC. FUND, <http://uspigredfund.org/issues/usf/label-gmo-foods> [hereinafter *Genetically Engineered Food Labeling Laws*] (last visited Oct. 19, 2015) (noting concerns of GMOs leading to desire for labeling).

26. See *State Labeling Legislation Maps*, *supra* note 10 (illustrating push for mandatory labeling of GM foods). Countries such as Zambia and Benin have official bans on genetically engineered food imports and cultivation, where other countries such as Australia, Russia, Turkey, Saudi Arabia, Iceland, and Denmark have mandatory labeling of nearly all GE foods. *Genetically Engineered Food Labeling Laws*, *supra* note 5 (mapping required labeling on foods with certain content of GM material). Other countries such as China, India, Brazil, Kenya, Ethiopia, Malaysia, and Indonesia have mandatory labeling of some GE foods. *Id.*

27. See Jeffrey Smith, *Spilling the Beans: Unintended GMO Health Risks*, ORGANIC CONSUMERS ASS'N (Mar. 1 2008), http://www.organicconsumers.org/articles/article_11361.cfm (illustrating health risks of GMOs). "The level of one known soy allergen is as much as 7-times higher in cooked GM soy compared to non-GM soy." *Id.*

28. Caitlin Shetterly, *The Bad Seed: The Health Risks of Genetically Modified Corn*, ELLE (July 24, 2013, 10:00 AM), <http://www.elle.com/beauty/health-fitness/advice/a12574/allergy-to-genetically-modified-corn/> (explaining symptoms resulting from allergy to GE corn). "[S]tarting in the mid-1980s, the biotechnology giant Monsanto began to genetically alter corn to withstand its herbicide Roundup . . . [t]hese small changes in the DNA of the corn are expressed by the plant as proteins . . .

eighty million copies per year, published this article, consumer concern for hidden allergens in GMOs was heightened; however, scientific studies have not confirmed the claims.²⁹

In addition to hidden allergens that are dangerous to human health, there is grave concern about the transfer of antibiotic resistance markers.³⁰ Antibiotic resistance markers selectively inactivate antibiotics protecting cells; but, increased use of antibiotics in medicine has resulted in a bacterium's ability to resist antibiotics, ultimately making some antibiotics ineffective to fight infection.³¹ Antibiotic resistance markers, also known as antibiotic resistance genes, introduced in GMOs, could possibly pass from the genetically modified plant to bacteria-creating antibiotic-resistant organisms that could lead to human infections.³² Even though there is only slight evidence in this area of study, resistance to antibiotics is so widespread that many of the first generation antibiotics are essentially useless.³³

[which] can act as allergens." *Id.* Eosinophils eliminate certain parasites and viruses when the immune system is working correctly; however, an allergenic protein such as one found in GE corn, can prompt eosinophils to be released, eventually damaging tissues and nerves. *Id.* "It's almost impossible to find a corn . . . in the United States that doesn't have the [allergenic] [protein] in it." *Id.* (internal quotation marks omitted) (alteration in original).

29. See Renae Morris, *Elle Australia Launch*, THE LOOP, <http://www.theloop.com.au/renaemorris/portfolio/elle-australia-launch/126460> (last visited Oct. 19, 2015) (describing audience of ELLE magazine). But see Kevin Bonham, *Allergic to Science-Proteins and Allergens in Our Genetically Engineered Food*, SCIENTIFIC AMERICAN (May 30, 2015) (asserting conception of GE crops producing new allergens as misleading). It is argued that GE production is the addition of "genes of known structure and function to crops" and toxin or allergens "would have to be by malicious intent of the scientist, not some accident"; however, these mutations in principle could result in new allergens. *Id.*

30. See TASK GROUP ON PUB. PERCEPTIONS OF BIOTECH., EUROPEAN FED'N OF BIOTECHNOLOGY, ANTIBIOTIC RESISTANCE MARKERS IN GENETICALLY MODIFIED (GM) CROPS 1 (Sept. 2001), available at http://www.biosafety.be/ARGMO/documents/EFB_AntibioticRM_English.pdf (reviewing use of marker genes for resistance to antibiotics in GM crops).

31. See *id.* (explaining risk of spreading antibiotic resistance genes).

32. See *id.* at 2 (noting purpose of antibiotic resistant maker genes). Antibiotic resistant genes are widely used for the selection of transformed plant cells to develop varieties that are herbicide-tolerant and insect-protected. *Id.*

33. See Tamara Walker, *How to Use Antibiotics Safely and Wisely*, PEDIATRIC SAFETY (Mar. 22, 2010) (noting bacteria develop resistance due to overused antibiotics); Ian Chopra & Marilyn Roberts, *Tetracycline Antibiotics: Mode of Action, Applications, Molecular Biology, and Epidemiology of Bacterial Resistance*, 65 MICROBIOL. & MOL. BIOL. REV. 232, 237 (2001) available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC99026/pdf/mr000232.pdf> (discussing resistance mechanisms of bacteria to certain antibiotics like tetracycline).

In 2012, the Food and Chemical Toxicology journal published a study that demonstrated that a population of rats that consumed GE food over a period of time was more likely to succumb to tumors and death at a much more aggressive rate than their counterparts in a controlled sample.³⁴ Although Food and Chemical Toxicology later retracted the study due to an inadequate sample size, the work is illustrative because it revealed that a diet of herbicide-resistant GE plants could cause development of kidney and liver tumors in animals.³⁵ GE plants are modified in laboratories to make crops and organisms resistant to the chemical herbicide glyphosate often referred to as the brand name Roundup-Ready, which ultimately allows farmers to use the chemical destroying almost all types of weeds, yet leaving their crops unharmed.³⁶ The study also found that adding glyphosates, like Roundup-Ready, to the animals' drinking water resulted in the development of tumors.³⁷

34. See generally Gilles-Eric Séralini et al., *Long Term Toxicity of a Roundup Herbicide and a Roundup-Tolerant Genetically Modified Maize*, 50 FOOD & CHEM. TOXICOL. 4221 (2012), available at http://ac.els-cdn.com/S0278691512005637/1-s2.0-S0278691512005637-main.pdf?_tid=9d21ed9e-5803-11e4-bec4-00000aacb35d&acdnat=1413773507_56993436b369406d2140560f0d4ac95e [hereinafter *Toxicity Study*] (detailing rat feeding study resulting in kidney tumors). Although the study has been retracted as a result of a poor sample size and use of rates that are prone to cancer, it shed some insight on the effect of GE plants on human health. See Gilles-Eric Séralini et al., *Retraction Notice to "Long Term Toxicity of a Roundup Herbicide and a Roundup-Tolerant Genetically Modified Maize"* [Food Chem. Toxicol. 50 (2012) 4221-4231], 63 FOOD & CHEM. TOXICOL. 244 (2014), available at http://ac.els-cdn.com/S02786915130080-90/1-s2.0-S0278691513008090-main.pdf?_tid=7ea72c0c-862a-11e5-8011-00000aacb360&acdnat=1446995457_de1f671e588bcf4535f895469d701c5e [hereinafter *Retraction*] (observing effect of GMO regarding human health).

35. See *Toxicity Study*, *supra* note 34, at 4223-27 (explaining effects of GE plants in animals). This study found that rats fed for two years with GE corn died earlier than the rats in the control group after developing significantly more tumors. *Id.* at 4223.

36. See William Neuman & Andrew Pollack, *Farmers Cope with Roundup-Resistant Weeds*, N.Y. TIMES, May 3, 2010 (explaining result of resistant weeds). Weeds that are now resistant to the glyphosate have resulted in a higher herbicide use with potentially higher health risks. See Tom Philpott, *How GMOs Unleashed a Pesticide Gusher*, MOTHER JONES (Oct. 3, 2012, 5:00 AM), <http://www.motherjones.com/tom-philpott/2012/10/how-gmos-ramped-us-pesticide-use> (providing GMO technology drove up herbicide use by eleven percent).

37. See *Toxicity Study*, *supra* note 34, at 4223 (detailing results of adding glyphosate to animals' drinking water).

B. Ethical Argument

In addition to effects on human health, the use of GMOs disrupts natural organisms by interfering with and extracting genes from one species to introduce desirable traits in another.³⁸ Crossing species boundaries and ultimately creating hybrid species is considered unnatural, possibly even immoral, by many consumers as it can have an adverse effect on the environment.³⁹ One area of concern in the development of biotechnology is the ability to produce crops resistant to certain pesticides and herbicides, ultimately resulting in greater repercussions to the surrounding environment.⁴⁰ Although these pesticides can protect crops against unwanted species, they can have unintentional effects on other species that are both beneficial and neutral to the crop.⁴¹

Along with effects on the environment, the ethical argument is also far-reaching to religious communities, and while considerations of GMOs often include hunger, poverty, ecological risks, and unforeseen consequences, the development of GMOs has also raised religious concerns.⁴² For example, within the Jewish religion, biotechnology raises various issues, especially in relation to the Jewish law *kilayim*, which prohibits mix-

38. See *Genetically Modified Foods and Organisms*, HUMAN GENOME PROJECT (Nov. 5, 2008), <http://theliteratesims.net/eng1bM/Readings/gmfoodsandorganisms.pdf> (noting ethical concerns of GMOs and biotechnology).

39. See Linda MacDonald Glenn, *Ethical Issues in Genetic Engineering and Transgenics*, ACTION BIOSCIENCE, <http://www.actionbioscience.org/biotechnology/glenn.-html> (last updated Nov. 2013) (arguing against transgenic combinations); Timothy W. Bates et al., *Executive Summary from the Genetically Modified Organism Exploratory Committee*, <http://www.macalester.edu/~montgomery/GMOs2.htm> (last visited Oct. 21, 2015) (discussing effects on environment).

40. See Bates et al., *supra* note 39 (highlighting resiliency of GM crops). Although helpful in food production, allowing farmers to use fewer chemicals and grow crops in less than ideal conditions, herbicide use will be higher as a result of resilient weeds, resulting in a larger negative effect on the surrounded environment. *Id.* Unintended hybrid strains of weeds and other plants will develop “through cross-pollination, thus negating the potential benefit of the herbicide.” *Id.* See also HUMAN GENOME PROJECT, *supra* note 38 (exposing result of higher herbicide use).

41. See Bates et al., *supra* note 39 (describing adverse effects). The “Monarch butterfly populations, which are not the target of the pesticide,” have been adversely affected by pesticides used as a result of GM yields. *Id.*

42. See Trey Popp, *God and the New Foodstuffs*, AGBIOWORLD (Mar. 2006), <http://agbioworld.org/biotech-info/religion/new-foodstuffs.html> (noting religious communities opinions of GMOs and diversity of religious approaches).

ing species.⁴³ While the Catholic Church is in a state of uncertainty when interpreting scripture in relation to GMOs, there is emphasis on skepticism relating to humans' producing unnatural lineages, which are presumed to be solely creations of God.⁴⁴ The Catholic Church is generally opposed to humans' encroaching upon the roles that are traditionally held as divine, such as creation and genetic modification of life.⁴⁵ Similar discussions regarding the acceptability of GMOs take place in the Islamic religion and some scholars have suggested that foods derived from GE crops could become *haram* (non-*halal*) because there is a possibility they contain DNA from forbidden foods.⁴⁶ Ultimately, across the board, religions are open to accepting technological changes like GE foods; however, individuals in those communities remain wary of the developments conflicting with their religious beliefs.⁴⁷

43. See Rabbi Avram I. Reisner, *Grappling with Sticky Issues*, AGBIOWORLD (Apr. 30, 2002), <http://agbioworld.org/biotech-info/religion/reisner.html> (proposing Jewish law issues with GMOs). Jewish belief

According to strict kilayim rules, one cannot mix seeds of different agricultural species and plant different species together in the same field. It is also against the rule to crossbreed animals or graft plants. It is even against the rule to yoke a donkey and ox to the same plow [O]ffspring of two different varieties of cattle [can] be considered kosher as long as those two varieties of cattle are "pure" and kosher. There are also cases where a Jew can encourage a Gentile (non-Jewish person) to crossbreed species in his or her possession, and then use the Gentile's products.

Id. But see Popp, *supra* note 42 (commenting on imperative of dealing with questions about poverty and hunger).

44. See Popp, *supra* note 42 (explaining opinion of Vatican). But see Richard Owen, *Vatican Says GM Food Is a Blessing*, AGBIOWORLD (Aug. 5, 2003), <http://agbioworld.org/biotech-info/religion/blessing.html> (noting Vatican's declaration GM foods hold answer to world starvation).

45. See Owen, *supra* note 44 (discussing Catholic Church's stance on GM foods).

46. K. Hazzah, *Are GMO's Halal?*, AGBIOWORLD (Aug. 4, 2000), <http://agbioworld.org/biotech-info/religion/halal.html> (highlighting debate of GMO foods as *halal*). "[S]wine DNA in soy could make the soy product *haram*" and therefore not fit for consumption by Muslims. *Id.*

47. See Wen S. Chern & Kyrre Rickertsen, *Consumer Acceptance of GMO: Survey Results from Japan, Norway, Taiwan, and the United States*, 7 TAIWANESE AGRIC. ECON. REV. 1, 4-6 (2001), available at http://www.gutierrezluciano.net/Default_files/contents_data/Corsi/Paper%203.pdf (noting attitudes towards GM food labeling).

IV. STATE OF DEBATE BETWEEN E.U. AND UNITED STATES' APPROACH TO GMO LABELING

A. *Objective of Mandatory Labeling Requirements*

The overall objective of mandatory labeling requirements is to provide consumer information, ultimately presenting consumers with a right to choose.⁴⁸ The rationale behind the provision of consumer information varies according to different labeling regulations of specific countries.⁴⁹ Countries with labeling based on production process believe their consumers are driven by non-safety related concerns such as ethics and environmental effects, whereas countries with product labeling believe their consumers are demanding product information relating to health safety.⁵⁰ Labeling requirements in the European Union and Japan, which ultimately resulted in a virtual disappearance of GE products, were initiated in response to consumers' concern, demand for information, and ultimate right to make an informed choice of what they put on their dinner tables.⁵¹

B. *The E.U. Approach*

In light of inconclusive safety concerns and potential risks, the European Union views biotechnology as a novel process

48. See Guillaume P. Gruère & S. R. Rao, *A Review of International Labeling Policies of Genetically Modified Food to Evaluate India's Proposed Rule*, 10 J. AGROBIOTECHNOLOGY MGMT. & ECON. 51, 54 (2007), available at <http://www.agbioforum.org/v10n1/v10n1a06-gruere.htm> (addressing overall objectives of labeling requirements). Labeling policies are designed to follow safety approval clearance because labeling is not primarily about food safety, but about consumer information. *Id.* Although consumer information is the primary focus, food safety concerns are indirectly related, as consumers want to avoid GM food out of fear of long term unknown risks. *Id.* at n.1.

49. See *id.* at 54-56 (characterizing labeling requirements).

50. See *id.* (comparing labeling rationale among countries). Labeling based on production process is focused on consumers basing their purchasing decision on issues such as environmental, religious, or ethical reasons. *Id.* at 54. Regulation for product labeling is based on the consumer demand for product information, essentially for safety-related concerns. *Id.* at 55.

51. See *id.* at 54-55 (describing reasons for European Union and Japan's initial labeling laws and results). See generally *supra* Part II (detailing consumer concerns and issues regarding GMOs). The policies within these countries have caused food processors and other retailers to avoid using GM ingredients, as some retailers voluntarily choose to exclude GMOs from their foods, others are concerned with the risk of their market shares decreasing as a result of the GMO conflict in Europe. See Gruère & Rao, *supra* note 48, at 54 (suggesting reasons for GMO extinction in countries with labeling laws).

that requires new regulations and, therefore, it has taken a precautionary approach by regulating GMOs.⁵² E.U. Member countries all follow a single mandatory GE food labeling regulation.⁵³ The European Union has a conclusive policy regulating the distribution and labeling of GE ingredients used in both the production process and the final product.⁵⁴ This approach to food policy “pursues the global objective of ensuring a high level of protection of human life, health, and welfare, as well as environment and consumer interests, whil[e] ensuring that the internal market works effectively.”⁵⁵

Prior to entering the market, the European Union requires that GMOs undergo a high level of scientific assessment, because the European Union deems them to be inherently different from their traditional counterparts.⁵⁶ The two main aspects

52. See Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on Genetically Modified Food and Feed, 2003 O.J. (L 268) 1, ¶¶ 1-45, available at http://ec.europa.eu/food/food/animalnutrition/labelling/Reg_1829_2003_en.pdf [hereinafter Regulation 1829/2003] (finding necessary framework for tracing and labeling GE materials to protect human health); David Jukes, *Novel Food Legislation in the European Union*, FOODLAW-READING (Jul. 25, 2014), <http://www.foodlaw.rdg.ac.uk/novel.htm> (summarizing adopted proposals for updated E.U. food legislation); Michael Lipsky, *Will European Requirements for Labeling GMO Foods Survive New Trade Negotiations?*, HUFFINGTON POST (Jul. 3, 2013), http://www.huffingtonpost.com/michael-lipsky/will-european-requirement_b_3535795.html (describing E.U. regulations as “precautionary”). The European Union first became involved in biotechnology regulation in the 1980’s when the Directorate Generals of the Environment, Consumer Protection and Nuclear Safety boards viewed biotechnology more skeptically than the other Directorate Generals. See Diahanna Lynch & David Vogel, *The Regulation of GMOs in Europe and the United States: A Case-Study of Contemporary European Regulatory Politics*, COUNCIL ON FOREIGN RELATIONS (Apr. 5, 2001), available at <http://www.cfr.org/agricultural-policy/regulation-gmos-europe-united-states-case-study-contemporary-european-regulatory-politics/p8688> (discussing history of E.U. GMO regulation). E.U. treaties have continued to change the environmental regulations and most of the regulatory policy-making has been issued at the national level with governments’ competing among themselves and with the European Union’s placing issues on the European regulatory agenda. *Id.* (discussing regulatory failures and diseases leading to labeling process).

53. See *Genetically Engineered Food Labeling Laws*, *supra* note 25 (illustrating detail of labeling in Europe).

54. See Regulation 1829/2003, *supra* note 52, at 1-2 (noting what specific provisional aspects of regulation should apply).

55. *EU’s New Approach on GMOs Cultivation*, EUR. COMM’N (Aug. 2, 2012), http://ec.europa.eu/dgs/health_consumer/dyna/consumervoices/create_cv.cfm?cv_id=666 [hereinafter EUROPEAN COMM’N] (assessing framework of European Union).

56. See Michael T. Roberts, *International Legal Issues Concerning Animal Cloning and Nanotechnology: More of the Same or Are ‘The Times They Are A-Changin’?*, NAT’L AGRIC. L. CTR. 10 (Nov. 2008), available at <http://nationalaglawcenter.org/wp->

of regulation in the European Union that cover the farming process and the final product placed on consumer shelves are Regulation 1829/2003 and Regulation 1830/2003.⁵⁷ Regulation 1830/2003 regulates each stage of the production process, mandating labels for any product that “contains or consists” of an ingredient derived from a GE plant.⁵⁸ The European Union ultimately enacted this regulation to ensure all GE foods are properly labeled before reaching the consumer to provide information about the product’s origin and a right to choose.⁵⁹ Regulation 1829/2003 regulates the final product, requiring labels for all GE animal feed and food for human consumption regardless of whether there is GE material in the final product.⁶⁰ The purpose of this regulation is to identify GE ingredients within the food chain; however, there are exceptions for enzymes and animals that consumed GE animal feed.⁶¹

C. *The U.S. Approach*

When deciding on the regulatory approach to GMOs, “the United States federal government faced two critical issues”: the first consisted of the government’s “legal authority to regulate biotechnology”; and the second, and more controversial, “whether regulations should govern the process” or the products of biotechnology.⁶² Although Congress has paid little at-

content/uploads/assets/articles/roberts_cloning.pdf (noting United States does not treat biotechnology as inherently different); *GMO Legislation*, EUROPEAN COMM’N, http://ec.europa.eu/food-/food/biotechnology/gmo_intro_en.htm (last updated Oct. 16, 2015) (outlining E.U. requirements prior to entering market).

57. See Regulation 1829/2003, *supra* note 52 (explaining E.U. Regulation). “The new authorisation procedures for genetically modified food and feed should include the new principles They should also make use of the new framework for risk assessment in matters of food safety.” *Id.* ¶ 9.

58. See *id.* at art. 24-25 (detailing Regulation 1830/2003).

59. See GUIDANCE NOTES FROM FOOD STANDARDS AGENCY AND DEPARTMENT FOR ENVIRONMENT, FOOD AND RURAL AFFAIRS, FOOD STANDARDS AGENCY § 1.2 (2004), available at <http://www.food.gov.uk/sites/default/files/multimedia/pdfs/gmguidancent.pdf> [hereinafter GUIDANCE NOTES] (defining purpose of Regulation 1830/2003).

60. See EUROPEAN COMM’N, *supra* note 55 (explaining E.U. Regulation 1829/2003).

61. See GUIDANCE NOTES, *supra* note 59, at §1.1 (providing rationale of Regulation 1829/2003).

62. See Lynch & Vogel, *supra* note 52 (discussing regulation of biotechnology in United States). “The latter approach rested on the assumption that there was nothing unique in employing genetically modified seeds to produce, for example, a longer-lasting tomato, since the end product was essentially identical.” *Id.*

tention to these issues, the Office of Science and Technology Policy, the Department of Agriculture (USDA), and the FDA supported regulating the products produced by biotechnology.⁶³ On the other hand, the Environmental Protection Agency was more concerned with the regulation of the biotechnology process.⁶⁴

Currently, “the Working Group, with personnel drawn from a number of different” government agencies, is “responsible for regulating biotechnology.”⁶⁵ This established consortium of agencies is the home for regulations of this sort and issued a Coordinated Framework for the Regulation of Biotechnology, which is the main document governing biotechnology in the United States.⁶⁶ With this framework, the FDA has become “responsible for biotechnologically-derived medical products.”⁶⁷ The FDA and USDA “worked to promote the introduction of GMOs,” approved the first bioengineered food in May of 1994 and “determined that labeling was not required” based on “the method of food production” unless the food was known to pose

63. See *id.* (noting interest these bureaucracies had in economic potential of biotechnology).

64. See *id.* (explaining Environmental Protection Agency (EPA) “not calling for new legislation” but insisted on developing “new risk assessment procedures”).

65. See *id.* (exposing White House’s ability to avoid public oversight with Working Group). The White House established this Working Group in 1984 and “specified EPA, USDA, and FDA as the three primary regulatory agencies for regulating biotechnology.” *Id.* The Reagan administration “established an interagency working group under the White House Cabinet Council . . . to clarify regulatory jurisdiction over biotechnology products.”

Introduction to Biotechnology Regulation for Pesticides, U.S. ENVTL. PROT. AGENCY, available at <http://www2.epa.gov/regulation-biotechnology-under-tsca-and-fifra/introduction-biotechnology-regulation-pesticides> (last updated Nov. 19, 2015). “The working group’s principal goal was to ensure the regulatory process adequately considered health and environmental safety consequences of the products of biotechnology as they move from the laboratory to the marketplace.” *Id.* Scientists, however, wanted the freedom to carry out their research without Congress passing restricting laws. *Id.* This resulted in the Working Group also emphasizing the importance of such innovations such as biotechnology in the United States. *Id.*

66. See Coordinated Framework for Regulation of Biotechnology, 51 Fed. Reg. 23,302 (proposed June 26, 1986), http://www.aphis.usda.gov/brs/fedregister/coordinated_framework.pdf (providing statutory authority for biotechnology regulation).

67. See Lynch & Vogel, *supra* note 52 (stating FDA would regulate GE products no differently than traditionally produced food).

safety problems.⁶⁸ To date, the FDA has not enacted labeling requirements for any genetically modified foods.⁶⁹

Although the FDA has not enacted regulations, “a number of U.S. companies including” Gerber, Frito-Lay, McCain Foods, and McDonalds promised not to “purchase any foods made with genetically altered seeds.”⁷⁰ Despite consumers’ concern, however, “a third of the American corn and cotton crop and more than half of the” country’s soybean crops are grown from solely genetically modified seeds, making a transition away from GMOs an expensive task for companies.⁷¹ The amount of genetically modified seeds in the United States also means “grocery-store food in the United States” is made up of approximately 60% of GMOs.⁷² Although the number of GMOs in American food was vastly increasing, consumer awareness of biotechnology remained very low.⁷³ Recently, however, awareness heightened, resulting in consumers’ demand for GMO labeling.⁷⁴

68. See *id.* (illustrating FDA’s concluding GE products not requiring regulation). The first bioengineered food was Calgene, Inc.’s FLAVR SAVR tomato, which has been modified by a reduction of an enzyme that degrades pectin along with the addition of a new protein and overall, the FDA evaluated the data and information provided by Calgene, Inc., to determine whether the tomatoes have been significantly altered, ultimately deciding that the FLAVR SAVR is as safe as natural tomatoes. CONSUMER SAFETY OFFICER, BIOTECHNOLOGY POLICY BRANCH, HFS-206, AGENCY SUMMARY MEMORANDUM RE: CONSULTATION WITH CALGENE, INC., CONCERNING FLAVR SAVR TOMATOES (May 17, 1994) (presenting FDA view of FLAVR SAVR).

69. See Lynch & Vogel, *supra* note 52 (reiterating United States’ lack of regulation).

70. See David Vogel, *Ships Passing in the Night: GMOs and the Politics of Risk Regulation in Europe and the United States* 6 (Ctr. for the Mgmt. of Envtl. Res., Working Papers 2002/34/CMER, 2002), available at https://www.insead.edu/facultyresearch/research/details_papers.cfm?id=9766; David Barboza, *Modified Foods Put Companies in a Quandary*, N.Y. TIMES, June 4, 2000 (noting companies’ response to consumer concern).

71. See Lynch & Vogel, *supra* note 52 (affirming vast numbers of GMOs in United States).

72. See *id.* (showing amount of GMO foods in grocery stores).

73. See *id.* (illustrating between 1996 and 1998, GE seeds increased fifteen fold in United States). In the mid-1990s, consumer awareness of biotechnology remained low and in August 1999, only 33% of Americans were aware that GE foods were being sold in supermarkets. See Marian Burros, *Different Genes, Same Old Label*, N.Y. TIMES, Sept. 8, 1999 (showing lack of consumer knowledge).

74. See *GMO Timeline- A History of Genetically Modified Foods*, GMO-AWARENESS.COM, <http://gmo-awareness.com/all-about-gmos/gmo-timeline-a-history-of-genetically-modified-foods/> (last visited Oct. 21, 2015) (explaining recent awareness of risks GMOs carry).

D. Current Proposed Legislation

The FDA failed to take action to require the labeling of GE foods, and because of this, states within the United States have taken the lead in protecting consumers' right to know what is in their food.⁷⁵ In 2013, fifty-four bills were introduced across

75. See *States Take Action*, *supra* note 9 (alluding to states responding to consumer concern). Colorado was able to collect over 171,000 signatures to get Proposition 105 on the November 2014 ballot. *Proposition 105*, RIGHT TO KNOW, <http://www.righttoknowcolorado.org> (last visited Oct. 19, 2015) (explaining voters' desire for labeling laws). Companies including PepsiCo, Coca-Cola, Kraft, Land O'Lakes, and Kellogg's, in opposition of Proposition 105, spent millions to campaign and keep voters in the dark about what is in their food. *Id.* The corporations won the battle and Proposition 105 was not passed; however, voters in Colorado will continue to fight for their right to know. *Id.* Corporations such as Hershey's, Heinz, Dole, Campbell's, and Bumble Bee also spent over USD46 million in the opposition to California's Proposition 37. *Companies Against GMO Labeling*, INSPIRATION GREEN, <http://www.inspirationgreen.com/vote-yes-on-37> (last visited Oct. 19, 2015) (tracing opposition back to large food companies). Companies in opposition of such labeling laws argue that these regulations will drive up costs of foods, confuse consumers "by implying a risk" that is non-existent and create cumbersome state laws. Christina Pirello, *Why Does the Food Industry Want to Block GMO Labeling Laws?* ONE GREEN PLANET (Nov. 24, 2014), <http://www.onegreenplanet.org/natural-health/why-does-the-food-industry-want-to-block-gmo-label-laws/> (addressing company's reasons to oppose labeling laws). "It would require tens of thousands of . . . food . . . products to be relabeled exclusively for Washington state" alone, that is unless companies remade their products with specially developed, non-GMO ingredients. Eric M. Johnson & Carey Gillam, *Food Corporations Fight GMO Labeling Measure with Big Money*, HUFFINGTON POST (Oct. 29, 2013), available at http://www.huffingtonpost.com/2013/10/29/food-giants-pour-millions_n_4175592.html (concluding labeling laws great burden on food companies). The companies in opposition to GMO labeling argue that genetically engineered crops help farmers increase their production and say there are hundreds of studies illustrating how GE crops are, in fact, safe. *Id.* Food companies are worried that shoppers will not buy their GMO foods, so they pour money into campaigns against labeling. Kathy Barker, *GMO Labeled Food, AAAS, Big Corporations and Citizens United*, SCIENTISTS AS CITIZENS (Nov. 15, 2014), <http://scientistsascitizens.org/2014/11/15/2-states-reject-gmo-labeling-says-aaas/> (suggesting companies spend a lot of money opposing labeling laws). In Illinois, House Bill 3085 "[r]equires genetically engineered raw agricultural commodities and processed foods offered for retail sale to bear certain labels." An Act Concerning the Labeling of Foods that Contain Genetically Engineered Material, H.B. 3085, 98th Gen. Assemb. (Ill. 2014), <http://www.ilga.gov/legislation/98/HB/PDF/09800HB3085lv.pdf> (highlighting state bill). Illinois proposed exemptions for certain classes of products but requires the Illinois Department of Agriculture to publish an annual "list of raw agricultural commodities" that are commonly GE. *Id.* Another Illinois proposed regulation Senate Bill 1666 states that if GMOs, both whole and processed, are above a specific percentage by weight, they must be labeled. An Act Concerning Health, S.B. 1666, 98th Gen. Assemb. (Ill. 2013), <http://www.ilga.gov/legislation/98/SB/PDF/09800SB1666lv.pdf> (explaining Illinois proposed regulation). Massachusetts House Bill 808 requires labeling of GMO foods that are in whole or in part produced with above a 0.1% threshold of GE microorganisms, plants or animals, regardless if there are GMOs in the final prod-

twenty-six states and a Washington State ballot initiative to enforce labeling laws narrowly lost.⁷⁶ As of June 2014, three states have passed GE labeling laws and there are twenty-nine total active legislative bills across fifteen states.⁷⁷ In thirty states, legislators introduced seventy bills and ballot initiatives regarding GMO labeling over the past two years.⁷⁸

E. State Police Powers

In the United States, state police powers derive from the Tenth Amendment of the Constitution, which gives the states “[t]he powers not delegated to the United States by the Consti-

uct. An Act Relative to the Labeling of Genetically Engineered Food, H.B. 808, 188th Gen. Court (Mass. 2013), <https://malegislature.gov/Bills/188/House/H808> (focusing on state bill). On March 27, 2014, the House accompanied this bill with a new draft, House Bill 3996, which is an act relative to the labeling of seed. An Act Relative to the Labeling of Seed, H.B. 3996, 188th Gen. Court (Mass. 2014), <https://malegislature.gov/Bills/188/House/H3996> (providing act in relation to labeling of seeds). As of January 6, 2015, no further action has been taken. *Id.*

76. *See States Take Action*, *supra* note 9 (illustrating states include Arizona, California, Florida, Massachusetts, Oklahoma, and Pennsylvania). Washington State’s ballot narrowly lost, 51-49%. *Id.* This narrow loss shows consumer push towards labeling laws).

77. *See id.* (outlining state initiative). Connecticut is the first state to have passed legislation requiring labeling of GMOs; however, “[w]hile the labeling provisions of the bill are strong, unfortunately, legislators added a ‘trigger clause,’ which requires that four other states in the northeast region enact similar bills before the law takes effect in Connecticut.” Michele Simon, *Connecticut Makes History as First State to Pass GE Food Labeling Law*, ALTERNET (June 4, 2013), <http://www.alternet.org/food/connecticut-passes-ge-food-labeling-law> (discussing Connecticut’s legislation). Maine is the second state to have passed legislation, but similarly to Connecticut, the legislation will not “go into effect until five nearby states, including New Hampshire, pass similar labeling laws.” *See* Reid Wilson, *Maine Becomes Second State to Require GMO Labels*, WASH. POST, Jan. 10, 2014 (highlighting similar legislation introduced in about thirty states). Vermont’s labeling law, Act 120, is unlike those of Maine and Connecticut, as the labeling law is slated to take effect in July 2016, pending the outcome of the lawsuit “filed by the Grocery Manufacturers Association, the National Association of Manufacturers, International Dairy Foods Association and the Snack Foods Association.” Terri Hallenbeck, *Burlington Free Press: Vermont Defends GMO Labeling Law*, RURAL VERMONT (Aug. 13, 2014), <http://www.ruralvermont.org/agriculture-in-the-news/burlington-free-press-vermont-defends-gmo-labeling-law/> (noting Vermont’s success in moving towards labeling laws). “Vermont has the right to require that genetically modified foods sold within the state be labeled.” *Id.* As of June 10, 2014, New York has five active bills, followed by Massachusetts and Rhode Island who currently have four each. *States Take Action*, *supra* note 9 (listing states with active bills). Colorado and Oregon have ballot initiatives on target for November 2014. *Id.*

78. *States Take Action*, *supra* note 9 (summarizing state legislation between 2013 and 2014).

tution.”⁷⁹ The Tenth Amendment’s reserved police powers include a state’s ability “to promote the health, safety, and morals of their respective citizens.”⁸⁰ Congress, however, has often used the Dormant Commerce Clause “to justify exercising legislative power over the activities of states and their citizens.”⁸¹ This “[c]ause has been viewed as both a grant of congressional authority and as a restriction on states’ power to regulate.”⁸²

79. U.S. CONST. amend. X (stating powers not delegated to United States reserved for states); *see also* U.S. GOV’T PUBL’G OFFICE, TENTH AMENDMENT: RESERVED POWERS 1509 (1992), <http://www.gpo.gov/fdsys/pkg/GPO-CONAN-1992/pdf/GPO-CONAN-1992-10-11.pdf> (providing Tenth Amendment).

80. MARSHALL DEROSA, *The Reserved Powers of the Tenth Amendment*, TENTH AMENDMENT CTR. (Aug. 31, 2013), <http://tenthamendmentcenter.com/2013/08/31/the-reserved-powers-of-the-tenth-amendment/> (explaining state powers). “States are . . . granted the power to establish and enforce laws protecting the welfare, safety, and health of the public.” *Police Powers*, LEGAL INFO. INST., http://www.law.cornell.edu/wex/police_powers (last visited Oct. 20, 2015) (noting general state police powers).

81. *Commerce Clause*, LEGAL INFO. INST., http://www.law.cornell.edu/wex/commerce_clause (last visited Oct. 19, 2015) (defining Commerce Clause). There is no definite meaning to the word “commerce.” *Id.* “Some argue that it refers simply to trade or exchange, while others . . . [define it as] broadly [related to] commercial and social intercourse between citizens of different states.” *Id.*

82. *See id.* (commenting on powers Commerce Clause granted to Congress). “The ‘dormant’ Commerce Clause refers to the prohibition, implied in the Commerce Clause, against states passing legislation that discriminates against or excessively burdens interstate commerce.” *Id.* The Supreme Court, early on in *Gibbons v. Ogden* and *Swift & Co. v. United States*, “ruled that the power to regulate interstate commerce encompassed the power to regulate interstate navigation.” *Id.* With the landmark case *NLRB v. Jones & Laughlin Steel Corp.*, the Court ruled the “activity was commerce if it had a ‘substantial economic effect’” or if there was a “cumulative effect” on interstate commerce. *Id.* (citing *NLRB v. Jones & Laughlin Steel Corp.*, 301 U.S. 1 (1937)). Throughout the Civil Rights movements, the Court ruled that the Commerce Clause extended to regulate businesses that serves mostly interstate travelers, businesses that “serve[] food which had previously crossed state lines,” essentially allowing Congress to prohibit discriminatory regulations. *Id.* If a law is not found to be discriminatory, it is then subject to the balancing test established by the Supreme Court, in *Pike v. Bruce Church*, and the challenging party would have to prove that an actual burden exists that outweighs any local benefit to the state. *Pike v. Bruce Church*, 397 U.S. 137, 142 (1970). In 1995, in *Lopez v. United States*, the Chief Justice held that Congress’s power only extends to “the channels of commerce, the instrumentalities of commerce, and” the “action that substantially affects interstate commerce.” *Commerce Clause, supra* note 81 (citing *Lopez v. United States*, 514 U.S. 549 (1995)). *Morrison* further restricted the Commerce Clause, and “[t]aken together, *Lopez* and *Morrison* have made clear that . . . if [the Court] does not find activity substantial enough to constitute interstate commerce it will not accept Congress’s stated reason for federal regulation.” *Id.* (citing *Morrison v. United States*, 529 U.S. 598 (2000)). Furthermore, the Eighth Circuit ruled, in 2001, that a state statute may affect the flow of interstate commerce but if it does not burden interstate commerce it is not invalid. *See Hampton Feedlot v. Nixon*, 249 F.3d 814, 819 (8th Cir. 2001) (commenting on state statute not burdening interstate commerce). A state can

V. FUTURE OF FOOD: PROPOSED REGIME TO REQUIRE STATES TO ENACT GMO LABELING BASED ON E.U. METHOD

A. *Recommendations for Framework of Mandated Laws Based on E.U. Regime*

An increasing majority of U.S. consumers believe that they should be informed whether the food they are eating has been genetically modified, and for these Americans, the E.U. requirements serve as a critical reference point.⁸³ Some states have recently introduced legislation that would ultimately enact labeling requirements or even restrictions on the sale of GMOs.⁸⁴ This state action is a result of the FDA not enacting labeling laws because it has failed to find GMOs materially different from traditionally grown food, unlike the European Union, which has found a material difference in GMOs.⁸⁵ By taking action, states are relying upon the Tenth Amendment to give them the power to enact laws to protect their residents' welfare and health.⁸⁶ Opponents of state legislation claim that the enacting of such laws is in direct violation with the Dormant Commerce Clause of the Constitution.⁸⁷ This view is not without merit and due to the Dormant Commerce Clause, states should only adopt some aspects of the E.U. regime when drafting their own labeling laws, but with the proper framework, states can constitutionally regulate GMOs.⁸⁸

only regulate commodities that do not have an extraterritorial reach controlling "beyond the boundaries of the state." *See Cotto Wax Co. v. Williams*, 46 F.3d 790, 793 (8th Cir. 1995) (deciding which commodities states can regulate).

83. *See Lipsky, supra* note 52 (stating cautionary approaches of European Union to bioengineering helpful to proponents of labeling laws); Lynch & Vogel, *supra* note 52 (describing E.U. GMO labeling laws as first legislation). Many other countries have modeled their mandating laws after the E.U. regimen. Lynch & Vogel, *supra* note 52.

84. *See supra* notes 75-78 and accompanying text (evidencing state legislation).

85. *See Policy Statement 22984, supra* note 5 (explaining FDA's stance on what constitutes as "materially different"); Lynch & Vogel, *supra* note 52 (noting FDA's lack of regulation); EUROPEAN COMM'N, *supra* note 55 (detailing E.U.'s finding of GMOs as inherently different than natural counterparts).

86. *See supra* note 79 (indicating allowance of states to enact laws based on state police powers); *supra* Part III.A. (explaining how GMOs effect health of consumers).

87. *See Hallenbeck, supra* note 77 (indicating opposition to state regulation); *supra* note 82 and accompanying text (defining Dormant Commerce Clause).

88. *Supra* Part IV.B. (explaining the E.U. regime); *supra* note 82 and accompanying text (noting restrictions Commerce Clause places on states). The Tenth Amendment gives states the power to mandate GMO labeling but must be done in

The Dormant Commerce Clause, through a construct of case law, takes the position that the state law must not be discriminatory or have an extraterritorial reach, and must not impose burdens upon interstate commerce.⁸⁹ To meet the first requirement, requiring the state law not to be discriminatory, state law restrictions on GMOs must impose similar restrictions upon suppliers from both the enacting state and those from out-of-state.⁹⁰ If the legislation imposes regulations that are consistent across the United States and not discriminatory toward other states and their food suppliers, it will survive constitutional scrutiny.⁹¹ As the E.U. regime provides, the mandatory labeling must be the same for all products entering into each Member Country.⁹² If enacting U.S. states framed their laws similar to that of the European Union, then implementing such laws would not be discriminating against out-of-state suppliers or food companies and would therefore fall within the powers reserved by the Tenth Amendment.⁹³

The Supreme Court interprets the Tenth Amendment to say that if the state law is found to be discriminatory, then it can still survive a constitutional challenge if the local interests served by the legislation are proven to have sufficient importance.⁹⁴ The enacting state also bears the burden of proof to show that there are no other means to accomplish those interests.⁹⁵ States have a legitimate interest in the welfare of re-

such a way that will not violate the Dormant Commerce Clause. *Supra* note 82 and accompanying text.

89. *See Commerce Clause, supra* note 81 (illustrating two-step approach of Dormant Commerce Clause). Extraterritoriality is when a law extends beyond the limits of the enacting state to persons who are amenable to the state's laws. *Id.*

90. *See id.* (explaining regulations cannot show discrimination).

91. *See id.* (requiring consistent legislation within states).

92. *See supra* note 52 and accompanying text (indicating European Union mandates standardized law for all Member Countries).

93. *See Commerce Clause, supra* note 81 (indicating state power to mandate in non-discriminatory way). If a state could frame the labeling law in such a way that would not discriminate against products produced in other states, it would not violate the Dormant Commerce Clause. *Id.* This could be done, for example, by regulating labels of only those products produced in the enacting state. *See generally id.*

94. *See supra* Part IV.E. (describing powers reserved to states). If a state can prove that it is protecting its citizens' welfare and interest its discriminatory law will be upheld if found to discriminate against interstate commerce. *Supra* Part IV.E.

95. *See supra* note 75 and accompanying text (evidencing FDA has not regulated GMOs). GMOs raise health concerns that are not being addressed by any other approach. *Supra* note 75 and accompanying text

sidents regarding health, religious, and ethical concerns, which federal regulations do not address.⁹⁶ If there are evenhanded restrictions on both out-of-state and in-state suppliers along with legitimate state interests, the states can carefully draft GMO legislation to survive a discriminatory challenge.⁹⁷

When drafting GMO legislation, a state must avoid controlling the conduct of parties who are outside of the enacting state to avoid having an unconstitutional extraterritorial reach.⁹⁸ For a state to avoid unconstitutional legislation, it must restrict GMOs in such a way that the restriction only applies to commodities grown and harvested in that particular state.⁹⁹ Unconstitutional extraterritorial reach prevents the states from adopting regulations 1829/2003 and 1830/2003, providing regulation on all products that reach consumers' shelves.¹⁰⁰ If state legislation is drafted correctly, states could restrict GMOs by only applying such regulation to those commodities grown in the enacting state rather than attempting to regulate commodities or sales beyond their borders.¹⁰¹ To avoid having an unconstitutional extraterritorial reach, state legislation would have to be silent regarding sales occurring outside of the enacting state.¹⁰² By following this framework, a state may be found to have an effect on the flow of interstate commerce, but will not be found to be a burden on interstate commerce or having an extraterritorial reach, because their regulation only reaches so far as to the boundaries of the enacting state.¹⁰³

If state law is found to be non-discriminatory and to not have an extraterritorial reach, it would still be subject to the bal-

96. See *supra* Part III (outlining arguments in support of GMO labeling). Arguments include but are not limited to health, ethical, religious, and safety concerns of consumers. *Supra* Part III.

97. See *supra* note 82 and accompanying text (illustrating state power to draft legislation withstanding discriminatory challenges).

98. See *Commerce Clause*, *supra* note 81 (noting under Commerce Clause states cannot have extraterritorial reach).

99. See *Cotto Wax Co.*, 46 F.3d at 794 (holding Minnesota statute prohibiting in-state sale of petroleum compounds did not constitute extraterritorial reach).

100. See *supra* notes 57-60 and accompanying text (noting regulations cover each stage of production and require labeling on all products before reaching consumers).

101. See *supra* note 83 (indicating state's right to regulate); see also *supra* note 93 (explaining ways states can enact labeling laws).

102. See *supra* note 99 and accompanying text (explaining states may not have extraterritorial reach).

103. See *Hampton Feedlot*, 249 F.3d at 819 (holding states cannot burden interstate commerce).

ancing test set out in *Pike v. Bruce Church*.¹⁰⁴ The state law must be enacted to accomplish a legitimate local public interest and any effects the legislation has on interstate commerce, as a result, must be incidental.¹⁰⁵ If a state placed restrictions on GMO seeds, a company selling seeds within that state would not be barred from selling any product at all, since they would just be restricted to selling non-GMO seeds, which would pass the balancing test established in *Pike*.¹⁰⁶ Under the balancing test, it is likely that the local benefits resulting from GMO restrictions would outweigh any burden upon interstate commerce that such legislation would impose.¹⁰⁷

B. Concern of Possible Issues Companies May Face

As the controversy over GMOs continues, some groups are advocating for mandatory labeling of food products, while other groups, namely companies within the food industry, oppose labeling and back their stance with large sums of money.¹⁰⁸ State labeling modeled after that of the European Union involves real costs to the food companies that are currently producing foods with genetically modified ingredients.¹⁰⁹ GMO labeling would require vastly large corporations, such as Coca-Cola, Kellogg's, and Kraft, to bear the costs of relabeling millions of products.¹¹⁰ Food companies could also face increased costs to identify the

104. See *Bruce Church*, 397 U.S. at 142 (providing balancing test).

105. See *id.* (illustrating requirements of state law). State laws must be reasonably related and serve a legitimate state purpose. *Id.* If enacting legislation that meets the requirements inadvertently affects interstate commerce, it will still be found to be constitutional. *Id.* at 143-44.

106. See *id.* at 143-44 (noting challenging party would have to prove actual burden on commerce exists outweighing state benefit).

107. See *supra* Part V.A. (predicting benefits of labeling overriding any effect on interstate commerce). Benefits include consumers' making an informed choice in regard to their health, ethical views, and religious beliefs. *Supra* Part III.

108. See *supra* note 75 and accompanying text (describing groups in support and in opposition of labeling laws). Many states and citizen groups support labeling laws where food companies are fighting back to avoid costs and inconvenience resulting from mandated labeling. *Supra* note 75 and accompanying text.

109. See *Pirello*, *supra* note 75 (explaining labeling or change in ingredients drives costs up for companies). GMOs have assisted agricultural crops to flourish, keeping costs of ingredients low. *Id.* Companies may face a rise in ingredient costs if there is a consumer shift away from GMOs once mandated labeling is enacted by the states. *Id.*

110. See *Johnson & Gillam*, *supra* note 75 (providing statistics in Washington state). The companies would also have to make a decision on whether or not to mainstream their labels due to the over pour of products across state lines. *Id.*

existence of GMO in their products through testing and accidental contamination of non-GMO crops with GMO counterpart crops.¹¹¹ To follow the E.U. regimen, companies would have to comply with certain state regulations, which would require a non-uniform label, ultimately driving up production costs.¹¹²

C. End Result of Consumer Shift Away from GMOs

Along with an increase in production, enacting labeling laws may result in a decline of companies' sales of products containing GMOs.¹¹³ By giving consumers the right to choose, with a clear label indicating GMOs, some will choose to no longer purchase those products.¹¹⁴ Due to the health risks, ethical arguments, and religious confictions, many consumers will choose non-GMO alternatives.¹¹⁵ Ultimately, similar to the European Union, labeling on foods will cause a U.S. consumer to shift away from products made with GMOs.¹¹⁶

VI. CONCLUSION

The European Union, unlike the United States, finds GMOs to be materially different from that of their natural counterpart and requires the labeling of such biotechnology used to produce food products.¹¹⁷ American consumers deserve the

111. See Pirello, *supra* note 75 (alluding to possible costs food companies incur as result of labeling laws). Costs could include purchasing different labels for different states rather than just mass-producing uniform labels for all of their consumers. *Id.*

112. See generally *supra* notes 96-101 and accompanying text (suggesting variations of labels from state to state). Regulations may differ from state to state, causing companies to have a number of different labels. *Supra* notes 96-101. Economic viability is a large concern, as GMOs contribute to a robust local and regional economy. *Id.*

113. See Barker, *supra* note 75 (setting forth companies' concerns for loss in sales).

114. See *id.* (explaining food companies' fear of customers steering clear of GMOs).

115. See *supra* Part III (illustrating once product proves to contain GMOs, consumers can choose alternatives).

116. See Roberts, *supra* note 56 (showing once labeling requirements in place, less consumption of GMOs).

117. See Lynch & Vogel, *supra* note 52 (contrasting European Union and United States treatment on GMOs materiality). The European Union views GMOs to have substantially different materiality than that of their natural counterpart, as they are enhanced and cross-bred with other species and bacteria in order to create a different food. *Id.* The United States, on the other hand, looks at materiality by comparing consumers senses of both GMOs and their natural counterpart. *Id.* For example, a GE tomato tastes, looks, feels, and smells the same as a tomato grown naturally. *Id.*

right to know what is in their food to make informed choices regarding their health, ethical concerns, and religious beliefs.¹¹⁸ Since the FDA will not take action regarding GMO labeling, consumers can rely on the Tenth Amendment to give states the power to enact these laws, similar to that of the E.U. regimen.¹¹⁹ Although the Dormant Commerce Clause places restrictions on states in regards to labeling laws, with the correct framework, states can require labeling in such a way that would uphold constitutional scrutiny.¹²⁰

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118. *See supra* Part III (making arguments in favor of consumer choice).

119. *See supra* Part IV.B., E. (modeling after E.U. regimen in part, states can enact labeling laws).

120. *See supra* Part IV.B. (explaining E.U. regime); *supra* note 82 and accompanying text (noting restrictions Commerce Clause places on states).