QUICK RESPONSE CODES FOR GENETICALLY ENGINEERED FOODS: A "QUICK FIX" TO AMERICA'S DEEP-ROOTED DEBATE SURROUNDING GENETICALLY ENGINEERED FOODS

Consumers, producers, and lawmakers have long debated whether to require labels for food containing genetically engineered ("GE") ingredients. In 2016, this question was seemingly answered with the National Bioengineered Food Disclosure Act ("NBFDA"), which mandated such labels. Nevertheless, the NBFDA did nothing to alleviate the public's concerns pertaining to GE food ingredients, and the debate surrounding the benefits and safety of GE food ingredients continues. This Comment suggests that the NBFDA was Congress' attempt to sidestep the underlying unease regarding these food products, rather than directly address the negative connotations that surround GE food ingredients.

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I. INTRODUCTION

As the use of genetically engineered organisms in food production has increased in the twenty-first century, discussions surrounding the consumption of bioengineered food products have accelerated. Consumers often refer to these products as "genetically modified organisms," or more often "GMOs."[1] Yet, the proper term for these controversial organisms Americans call GMOs is actually genetically engineered ("GE").[2] Farmers are well aware of the benefits of using GE crops for production as GE crops increase harvest yields, efficiency, and food availability while decreasing costs for the farmer and consumer.[3] Conversely, consumers know little about what it means to eat GE food,[4] which is likely one reason why in recent years consumers have grown increasingly concerned over whether there are GE organisms in the food they eat.[5] Though the vast majority of the scientific community agrees that GE food poses no hazards to human

1. *See* Margie Alsbrook, *10 Things Every Lawyer Should Know About GMOs*, 50 ARK. LAW. 24, 24 (2015).
2. *Id.*
3. Michael Stebbins, *3 Ways GMOs Keep the Cost of Food Down*, FORBES (Apr. 29, 2016, 4:10 PM), https://www.forbes.com/sites/gmoanswers/2016/04/29/3-ways-gmos-keep-cost-of-food-down/#26441f51261d.
4. Phil Lempert, *Surprise! Shoppers are Confused About Food and GMOs*, SUPERMARKET GURU (Oct. 31, 2017), https://www.supermarketguru.com/articles/surprise-shoppers-are-confused-about-food-and-gmos.html.
5. *See* Hadley Malcom, *Non-GMO Demand Growing Despite Report That Says GMOs are Safe*, USA TODAY (May 18, 2016, 4:30 PM), https://www.usatoday.com/story/money/2016/05/18/gmo-report-not-likely-to-change-minds-over-gmo-concern/84501686/.

health,[6] millions of Americans think otherwise.[7] The perceptions that Americans have about GE food led Congress to pass the National Bioengineered Food Disclosure Act ("NBFDA") in July 2016.[8] Amongst much debate about preempting numerous state laws related to GE food labeling, one broad theme was a concern about *how* the NBFDA would allow producers to label their products.[9]

The enacted bill included three options for how producers could disclose GE food: (1) text, (2) symbol, or (3) electronic or digital link.[10] While the first two options are rather self-explanatory, the third option—electronic or digital links—called for its own study to determine whether an adequate number of consumers would feasibly have access to the disclosure method.[11] This third method would allow producers to use a quick response ("QR") code to label their foods as GE.

Individuals in support of GE food, and also those opposed, instinctively assume that a QR code will have little to no impact on consumers.[12] Proponents and opponents both anticipate that requiring consumers to scan a QR code will pose a barrier to the consumer that would not exist if the producer instead followed the first disclosure method and simply printed the words "produced with genetic engineering."[13] Therefore, consumers will often refrain from scanning the code, and their purchasing decisions will remain the same as before the NBFDA.[14] Nonetheless, there is more to debate about using QR codes than just access to information for consumers.

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6. *See* Elizabeth Weise, *Academies of Science Finds GMOs Not Harmful to Human Health*, USA TODAY (May 17, 2016, 11:32 AM), https://www.usatoday.com/story/tech/2016/05/17/gmos-safe-academies-of-science-report-genetically-modified-food/84458872/.

7. Rebecca Rupp, *GMOs: Is Just Any Label Enough?*, NAT'L GEOGRAPHIC (July 14, 2016), https://www.nationalgeographic.com/people-and-culture/food/the-plate/2016/07/gmo-label/ (mentioning a *The New York Times* poll where the vast majority of individuals surveyed were convinced GE foods were "unsafe or toxic, caused cancer or allergies, and were in general hazardous to human health").

8. Steve Ansolabahere & Jacob E. Gersen, *The GMO Labeling Fight Is Not Industry Versus Consumers*, FORBES (Aug. 26, 2016, 6:32 PM), https://www.forbes.com/sites/realspin/2016/08/26/the-gmo-labeling-fight-is-not-industry-versus-consumers/#15b6619a766f; *see* National Bioengineered Food Disclosure Act 2016, Pub. L. No. 114-216, 130 Stat. 835 (codified at 7 U.S.C.A. §§ 1639, 1639a, 1639b, 1639c, 1639i, 1639j (West 2018).

9. *Debate Continues on QR Codes for GMO Food Labels*, BROWNFIELD AG NEWS (Aug. 11, 2016), http://brownfieldagnews.com/news/debate-continues-qr-codes-gmo-food-labels/.

10. 7 U.S.C.A. §1639b(b)(2)(D).

11. *Id.* § 1639b(c).

12. *See* 162 CONG. REC. S4848 (daily ed. July 7, 2016) (statement of Sen. Leahy).

13. *See* Dan Charles, *Congress Just Passed a GMO Labeling Bill. Nobody's Super Happy About It.*, NPR: THE SALT (July 14, 2016, 5:34 PM), https://www.npr.org/sections/thesalt/2016/07/14/486060866/congress-just-passed-a-gmo-labeling-bill-nobodys-super-happy-about-it.

14. *Id.*

QR codes signal a Congressional "quick fix" to a longer-standing, deeper-rooted debate in the US. Using QR codes, Congress has devised a solution that avoids resolving the negative connotations that surround GE foods. The barrier to information that Congress established with QR codes creates an "out of sight, out of mind" fix to the deeper question that initially led consumers to request mandatory labeling—whether we should be eating GE food in the first place.

This Comment's analysis focuses on some of the legal implications that will arise from implementing this mandatory labeling "quick fix." Ultimately, this new labeling bill shows that the US government instinctively treats GE food differently than its consumers desire. No matter whether GE foods are safe to consume or not, failing to address this underlying issue could have domestic and international implications in the future. Part II will start with explaining GE organisms' rise to popularity. Then, Part III will discuss the debate leading up to Congress' decision to pass the NBFDA. This Part will also explain the NBFDA's provisions and the results of the NBFDA's required study (the "Study"). Part IV will analyze the problems that this "quick fix" mindset will likely create domestically. Then, Part V will analyze potential international ramifications associated with the NBFDA. Finally, Part VI will discuss what the US should do to alleviate these concerns moving forward.

II. GE ORGANISMS ARE INCREASINGLY POPULAR IN UNITED STATES AGRICULTURE BECAUSE THEY LEAD TO HEALTHIER AND MORE PRODUCTIVE CROPS

Genetic modification is not a new phenomenon. Humans "have been modifying crops for thousands of years through selective breeding."[15] Selective breeding is a common practice that occurs when an individual consciously selects certain plants for desirable traits.[16] In contrast, genetic engineering isolates one single gene for a desired trait, adds it to a plant grown in a laboratory, and generates a plant which has that desired trait.[17] Thus, the process of creating genetically engineered plants requires modern technology, but

15. *Consumer Info About Food for Genetically Engineered Plants*, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/Food/IngredientsPackagingLabeling/GEPlants/ucm461805.htm (last updated Jan. 4, 2018).

16. *Genetic Modification Explained*, SCI. MEDIA CTR. (Sept. 19, 2008), https://www.sciencemediacentre.co.nz/2008/09/19/genetic-modification-explained/; *see also Consumer Info About Food for Genetically Engineered Plants*, *supra* note 15 ("Traditional breeding involves repeatedly cross-pollinating plants until the breeder identifies offspring with the desired combination of traits. The breeding process introduces a number of genes into the plant. These genes may include the gene responsible for the desired trait, as well as genes responsible for unwanted characteristics.").

17. *Consumer Info About Food for Genetically Engineered Plants*, *supra* note 15.

farmers have utilized genetic selection techniques in their fields for generations.

GE crops began increasing in popularity in the early 1990s.[18] A GE tomato, modified to delay premature fruit softening, was introduced in US grocery stores, and this soon led to numerous other GE crops.[19] Though the GE tomato was introduced to increase grocery store profits, GE crops were quickly adopted across the US, and today the most widely used GE crop varieties often include traits such as herbicide-tolerance and insect-resistance.[20] Farmers also have the opportunity to use stacked gene varieties which combine two or more traits together, offering even more benefits to using GE crop varieties.[21] Stacked gene varieties are the most commonly used types of GE plant varieties.[22] Overall, in 2017, 94%of US soybeans planted were GE, and 92% of all US corn crops were GE.[23] In the past twenty years, US agriculture has widely embraced GE crops, and the reasons why are endless.

The rising popularity of GE crops in recent years stems from their increased efficiency and production yield. Herbicide-tolerant crops provide farmers with more effective options for weed control.[24] They protect the crops from herbicide treatments, allowing farmers to more effectively control the weeds, which leads to healthier crops.[25] Healthier crops lead to greater yields.[26] Insect-resistant crops have a similar effect, ultimately decreasing crop losses due to pests and increasing efficiency.[27] Consequently, GE plant varieties increase plant efficiency while saving farmers time and money.[28] Though GE crops are indeed beneficial to the farmer, the benefits also extend to consumers.

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18. *Id.*; Jan M. Lucht, *Public Acceptance of Plant Biotechnology and GM Crops*, 7 VIRUSES 4254, 4254 (2015) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4576180/pdf/viruses-07-02819.pdf.

19. Lucht, *supra* note 18.

20. *See Adoption of Genetically Engineered Crops in the U.S.*, U.S. DEP'T AGRIC., https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/ (last updated Apr. 2, 2018).

21. *Pocket K No. 42: Stacked Traits in Biotech Crops*, INT'L SERV. FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS, http://isaaa.org/resources/publications/pocketk/42/default.asp (last updated Oct. 2017).

22. *Adoption of Genetically Engineered Crops in the U.S.*, *supra* note 20.

23. *Id.*

24. *Recent Trends in GE Adoption*, U.S. DEP'T AGRIC., https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx (last updated July 12, 2017).

25. *See* Lucht, *supra* note 18, at 4255.

26. *Id.*

27. *Id.*

28. *Id.*; *see generally* JORGE FERNANDEZ-CORNEJO ET AL., U.S. DEP'T AGRIC., GENETICALLY ENGINEERED CROPS IN THE UNITED STATES (2014), https://www.ers.usda.gov/webdocs/publications/45179/43668_err162.pdf?v=41690.

US consumers' budgets benefit from GE crops with every trip to the grocery store. Since the improved plant traits increase production, the price of food can decrease while the availability of food increases.[29] According to one study, the price of corn would be almost 6% higher without GE traits, while the price of soybeans would be almost 10% higher.[30] Additionally, without GE crops, the overall supply of corn, soybeans, wheat, barley, and other crops would fall.[31] Not only do customers benefit from food affordability, but increased production numbers benefit consumers in food availability as well.

As the world population continues to exponentially increase, the importance of food availability will become steadfastly more clear. The United Nations has projected that our global population will reach greater than 9.7 billion people by the year 2050.[32] To meet the needs of the future population, farmers must grow approximately 70% more food with the same amount of land.[33] Approximately 35–42% of the world's crop production is lost to insects, pests, and diseases—all losses which genetic engineering can prevent.[34] Thus, GE crops are certainly a potential tool to aid in assuring future global food security.

III. THE NATIONAL BIOENGINEERED FOOD DISCLOSURE ACT: CONGRESS' ATTEMPT TO MEET RISING CONSUMER DEMAND FOR GE FOOD LABELS

Despite the growing number of GE crops planted and harvested in the US each year, until the NBFDA was passed in 2016 there was

29. *See* Stebbins, *supra* note 3 (referencing a study completed in 2010 which estimated that the worldwide additional cost of consumption without biotech traits would be $116.6 billion dollars); *see also* Val Giddings, *USDA: GMOs Represent Cost Savings for Consumers and Benefits for Farmers*, GENETIC LITERACY PROJECT (Mar. 4, 2016), https://geneticliteracyproject.org/2016/03/04/usda-gmos-represent-cost-savings-consumers-benefits-farmers-environment/ (discussing the difference between costs to raise GE foods versus the cost to raise organic foods and noting that "GE food represents real cost savings for consumers, and widely shared benefits to farmers and the environment worldwide").

30. Graham Brookes et al., *The Production and Price Impact of Biotech Crops*, CTR. FOR AGRICULTURAL & RURAL DEVELOPMENT 25, 26, 30 (2010), https://www.card.iastate.edu/products/publications/pdf/10wp503.pdf.

31. *Id.* at 25–29, 32–37.

32. Max Roser & Esteban Ortiz-Ospina, *World Population Growth*, OUR WORLD IN DATA (Apr. 2017), https://ourworldindata.org/world-population-growth/ (using an interactive chart to show increasing population numbers and referencing how world population has increased from 1.5 to 6.1 billion in one hundred years).

33. *Meeting Increasing Food Demand Sustainably*, GMO ANSWERS https://gmoanswers.com/meeting-increasing-food-demand-sustainably-0 (last visited June 23, 2018).

34. *Id.*

no federal requirement to label foods as GE foods.[35] This Part will discuss the initiatives that led up to mandatory GE labeling in the US, why Congress decided to take action, and what concerns have arisen since the rulemaking process.

A. Requiring Mandatory GE Food Labels for the First Time in the US, the NBFDA Was Created Due to Consumer Request for GE Labels

The NBFDA was Congress' first successful attempt to require mandatory labels for GE food products and arose because of the strife that surrounded the matter. Since the rise of GE crops and their incorporation into the food cycle, increased discussion on the topic of food labeling ultimately led to the NBFDA.[36] Consumer groups argued for the right to know whether foods included GE ingredients for years.[37] This request began out of a fear that GE foods may be unsafe.[38] Meanwhile, GE food producers opposed labeling where there was an absence of any demonstrated health risks.[39] The reason for opposition to labeling was a fear that "[i]nstead of providing people with useful information, mandatory . . . labels would only intensify the misconception" surrounding GE foods.[40] Thus, the labeling negotiations stemmed from a conflict over the misconceptions surrounding food technology.[41] The compelling arguments between proponents and opponents of GE foods delayed Congress' deliberations over whether to require mandatory GE food labeling.[42]

GE foods undergo significant testing before market approval, and this is one reason why the need for labels was questioned. The Food

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35. Lesley K. McAllister, *Implementing the National Bioengineered Food Disclosure Standard*, 13 J. FOOD L. & POL'Y 134, 136 (2017).

36. *Id.* at 134–35.

37. *Id.*

38. *See* TH Lee et al., *Genetically Modified Foods and Allergy*, 23 HONG KONG MED. J. 291, 291 (2017); *see generally* Gary Hirshberg, *Why Labeling Makes Sense*, JUST LABEL IT (Mar. 6, 2013), http://www.justlabelit.org/right-to-know-center/why-labeling-makes-sense/.

39. *See, e.g.*, *Labeling Food and Ingredients Developed from GM Seed*, MONSANTO (Apr. 6, 2017), https://monsanto.com/company/commitments/safety/statements/gmo-food-labeling/.

40. Dan Nosowitz, *Will "Contains GMO" Labels Scare Off Customers?*, MODERN FARMER (July 31, 2015), https://modernfarmer.com/2015/07/will-gmo-labeling-scare-off-customers/ (quoting *Labels for GMO Foods Are a Bad Idea*, SCI. AM. (Sept. 1, 2013), https://www.scientificamerican.com/article/labels-for-gmo-foods-are-a-bad-idea/).

41. Omri Ben-Shahar, *The GMO Labeling Fight Has Nothing To Do With Information – On Either Side*, FORBES (Mar. 21, 2016, 11:46 AM), https://www.forbes.com/sites/realspin/2016/03/21/the-gmo-labeling-fight-has-nothing-to-do-with-information-on-either-side/#18248c92691e (arguing that the debate "ought to be won by recognizing the overwhelming value of [GE] foods and alleviating unfounded fears").

42. Charles, *supra* note 13 (explaining the years of debates and competing arguments surrounding GMO labeling before Congress passes the NBFDA).

and Drug Administration ("FDA"), Environmental Protection Agency ("EPA"), and United States Department of Agriculture ("USDA") are responsible for regulating and approving GE crops and food.[43] Each product is extensively tested before acquiring pre-market approval, and there is negligible documentation indicating that GE foods carry any specific health concerns.[44] Nevertheless, even though there is a thorough vetting process to ensure GE food safety, consumers still continued requesting GE food labels.[45]

The initiative requesting GE labels was slow to start, but everything soon changed when states began passing individual labeling mandates. In 2014, Vermont passed the first state mandate requiring labels for GE food, and soon other states followed the trend.[46] Eventually these "patchwork" laws led Congress to begin work on a federal GE labeling law.[47] In debates leading up to the bill's passage, individuals noted a variety of reasons why consumers would like to know whether they are eating GE foods.[48] Consumer-driven deliberations led the way to the NBFDA, but they were not the only interests Congress considered before the bill's passage.

Though consumer interests were inescapably a consideration in passing the NBFDA, debate also centered around producers' concerns over the implications the bill would generate. Congressional members noted that the general campaign against agricultural biotechnology had "raised concerns among consumers," leading to "arbitrary and inconsistent labeling laws" that threatened consumer

43. LIBRARY OF CONG., *Restrictions on Genetically Modified Organisms: United States*, https://www.loc.gov/law/help/restrictions-on-gmos/usa.php #_ftnref61 (last updated June 9, 2015) (explaining the various agencies' responsibilities and comprehensively listing the appropriate authorizing sections of the United States Code).

44. TH Lee et al., *supra* note 38, at 293.

45. *See, e.g.*, Jacob Bunge, *Food Executives Say Consumers Want Labels on GMO Products*, WALL ST. J. (Oct. 6, 2016, 5:45 PM), https://www.wsj.com/articles /food-co-executives-say-consumers-want-labels-on-gmo-products-1475789267.

46. McAllister, *supra* note 35, at 134–35 (listing Vermont, Maine, and Connecticut as states with GE labeling laws in place while also referencing other states which had begun proposed legislation for GE labeling).

47. *Id.* at 135; *see also* 764 CONG. REC. H4935 (daily ed. July 14, 2016) (statement of Rep. Newhouse) (stating that as a farmer himself, the patchwork of State laws would "increase the cost of production and compliance for farmers as well as food producers").

48. *See, e.g.*, 764 CONG. REC. H4936 (daily ed. July 14, 2016) (statement of Rep. DeFazio) (noting that consumers want to know whether they are eating GE foods just like they want to know whether their food has any other ingredient like food coloring, corn syrup, milk, or soy); 764 CONG. REC. S4846 (daily ed. July 7, 2016) (statement of Sen. Leahy) (mentioning religious purposes or concerns about increased herbicide use).

confusion and increased food costs.[49] For many, the fight against food labeling remained based in the concern that GE labeling would lead to more individuals failing to understand the values of GE foods and choosing to purchase non-GE foods due to unfounded fears.[50] Essentially, the bill became a debate featuring concerns about consumers' "right to know" versus their "right" to remain wholly unaware of GE foods' benefits to civilization and the negligible science showing any adverse effects from consuming GE foods.[51] Regardless of which side of this debate members of Congress fell, ultimately Congress concluded that creating national consistency in labeling outweighed the other concerns associated with the bill.[52]

B. The NBFDA Was Passed in 2016 and Allowed Producers to Label GE Foods with Electronic or Digital Links

Congress passed the NBFDA on July 29, 2016, requiring "mandatory bioengineered food disclosure standard[s] with respect to any bioengineered food and any food that may be bioengineered . . . ."[53] The NBFDA requires the Secretary of the USDA ("Secretary") to establish requirements and procedures as "necessary to carry out the standard" by July 29, 2018.[54] It excludes labeling products from animals that have consumed bioengineered feed, and further requires that the Secretary determine the amount of a bioengineered substance that must be present in a product to require a bioengineered label.[55] Importantly, the NBFDA requires that disclosure be "a text, symbol, or *electronic or digital link*" and that the food manufacturer select their preferred disclosure method.[56] The NBFDA clearly specifies that a food successfully completing the pre-market regulatory review process "shall not be treated as safer than, or not as safe as, a non-bioengineered counterpart of the food

49. *See, e.g.*, 764 CONG. REC. H4934 (daily ed. July 14, 2016) (statement of Rep. Conaway); *see also* Ben-Shahar, *supra* note 41 (noting the real "battle" was over food technology, "cloaked as [being] over disclosure laws").

50. *See, e.g.*, 764 CONG. REC. H4935 (daily ed. July 14, 2016) (statement of Rep. Davis) (stating "activists have publicly acknowledged their objective is to stigmatize a safe and valuable tool for America's farmers"); Rupp, *supra* note 7 (showing that even labeling mandate supporters have noted "a gaping divide between reputable scientific research and public perception").

51. Ben-Shahar, *supra* note 41.

52. *See* 764 CONG. REC. H4934–38 (daily ed. July 14, 2016) (recording statements made during debate that acknowledged the bill's imperfections while emphasizing the importance of a national standard for how to label GE products).

53. 7 U.S.C.A. § 1639b(a)(1) (West 2018).

54. *Id.* § 1639b(a)(2). Despite this deadline, as of July 29, 2018, a rule was still not finalized. *See Establishment of a National Bioengineered Food Disclosure Standard*, REGULATIONS.GOV, https://www.regulations.gov/docket?D=AMS-TM-17-0050 (last visited Aug. 10, 2018).

55. 7 U.S.C.A. § 1639b(b)(2)(A)–(B).

56. *Id.* § 1639b(b)(2)(D) (emphasis added).

solely because the food is bioengineered or produced or developed with the use of bioengineering."[57]

Further, the NBFDA required that the Secretary conduct the Study "to identify technological challenges that may impact whether consumers would have access to the bioengineered disclosure statement through electronic or digital disclosure methods."[58] The Study was to include opportunity for public comments,[59] and the NBFDA listed required factors for the study.[60] Those factors included:

> (A) The availability of wireless Internet or cellular networks.
>
> (B) The availability of landline telephones in stores.
>
> (C) Challenges facing small retailers and rural retailers.
>
> (D) The efforts that retailers and other entities have taken to address potential technology and infrastructure challenges.
>
> (E) The costs and benefits of installing in retail stores electronic, digital link scanners, or other evolving technology that provide bioengineering disclosure information.[61]

The NBFDA also specified that if, after the Study, the Secretary determines that "consumers, while shopping, would not have sufficient access to the bioengineering disclosure through electronic or digital disclosure methods, the Secretary, after consultation with food retailers and manufacturers, shall provide additional and comparable options to access the bioengineering disclosure."[62] Under the NBFDA, the Study was necessary to determine whether QR codes were sufficient for GE food labeling.

C. The USDA Study Regarding Electronic or Digital Link Disclosure Showed That Many Citizens, but Not All, Can Access Information with QR Codes

According to the NBFDA, the USDA was to complete the Study no later than July 29, 2017.[63] The USDA contracted with Deloitte to complete the Study, and, as of June 2017, it was on track for completion.[64] However, the Secretary also needed to publish the

57. *Id.* § 1639b(b)(3).
58. *Id.* § 1639b(c)(1).
59. *Id.* § 1639b(c)(2).
60. *Id.* § 1639b(c)(3).
61. *Id.* § 1639b(c)(3)(A)–(E).
62. *Id.* § 1639b(c)(4).
63. *Id.* § 1639b(c)(1).
64. Megan Poinski, *USDA on GMO Labeling Law: 'Still on Track, but a Little Behind,'* FOOD DIVE (June 7, 2017), https://www.fooddive.com/news/usda-on-gmo-labeling-law-still-on-track-but-a-little-behind/444383/.

Study since the NBFDA required opportunity for public comment.[65] Nearly one month after the Study's mandatory deadline, the Center for Food Safety ("CFS") filed suit against the Secretary, seeking for the court to provide declaratory and injunctive relief for failure to comply with the mandatory deadlines.[66] A few days after CFS filed suit, the USDA released its results.[67] Included within the Study's key results was the fact that 77% of Americans own a smartphone and ownership rates are trending upward.[68] Though a large percentage of Americans own a smartphone, 85% experience challenges when scanning digital links.[69] The Study found that 100% of national chain stores and 97% of regional chain stores provide Wi-Fi in store, but only 37% of small retailers provide Wi-Fi in store.[70] Additionally, though almost 94% of Americans live in areas with sufficient broadband access to scan a digital link, some retailers may need to install Wi-Fi networks for customers who do not have access to cellular data.[71]

Another interesting aspect of the rulemaking process is that the USDA's period for public input on the Bioengineered Food Disclosure Questions was set to close August 25, 2017.[72] Although the USDA received over 112,000 responses, none of these could have utilized information from the Study since it was not released until after the input period closed.[73] Further, the proposed questions contained no reference to the Study.[74] Although there was an email address accessible on the USDA's website, the USDA seemingly did not make an easy opportunity for public comment regarding the Study.[75] Thus,

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65. 7 U.S.C.A. § 1639b(c)(2).

66. Compl. at 1–2, Ctr. for Food Safety v. Perdue, No. 15-CV-01590-HSG (N.D. Cal. May 24, 2018).

67. *See Study of Electronic or Digital Disclosure*, U.S. DEP'T AGRIC. (Sept. 6, 2017), https://www.ams.usda.gov/reports/study-electronic-or-digital-disclosure (showing that the Study was released on September 6, 2017); *see also* Dave Fusaro, *USDA Finally Releases GMO QR Code Study*, FOOD PROCESSING (Sept. 9, 2017), https://www.foodprocessing.com/industrynews/2017/usda-releases-qr-code-study/ (commenting on the release of the study).

68. DELOITTE, STUDY OF ELECTRONIC OR DIGITAL LINK DISCLOSURE: A THIRD-PARTY EVALUATION OF CHALLENGES IMPACTING ACCESS TO BIOENGINEERED FOOD DISCLOSURE 11 (2017), https://www.ams.usda.gov/sites/default/files/media/USDADeloitteStudyofElectronicorDigitalDisclosure20170801.pdf.

69. *Id.* at 4.

70. *Id.* at 11.

71. *Id.*

72. *Public Input on Bioengineered Food Disclosure Questions*, U.S. DEP'T AGRIC., https://www.ams.usda.gov/rules-regulations/public-input-bioengineered-food-disclosure-questions (last visited June 23, 2018).

73. *Id.*

74. *Id.*

75. *Victory! USDA Releases GMO Labeling Study*, CTR. FOR FOOD SAFETY (Sept. 7, 2017), https://www.centerforfoodsafety.org/press-releases/5061/victory-usda-releases-gmo-labeling-study ("It is unclear how the USDA plans to comply with the federal law's other mandates for the study, including that the public be given the right to comment on it.").

it is difficult to know how much emphasis the USDA will have placed on the Study at the completion of the rulemaking process.

IV. QR CODES ARE INCONSISTENT WITH THE SPIRIT OF THE NBFDA AND WILL NOT CHANGE DOMESTIC PERCEPTIONS OR UNDERSTANDINGS REGARDING GE FOODS

Although there are three ways a producer may disclose GE foods (text, symbol, or electronic or digital link), the Study required in the NBFDA strikes at the heart of the NBFDA controversy.[76] While proponents of GE labeling would agree that providing QR codes for GE labeling is better than providing no labeling at all,[77] it will not afford adequate GE food information to *all* Americans. Moreover, the NBFDA does little to combat the difficulties the US faces due to potential misperceptions surrounding GE products.

A. Domestic Concerns with the NBFDA Are Valid Because QR Codes Do Not Provide Easy Access to Information About GE Foods

The first issue with the NBFDA is the availability of information for citizens wishing to know whether they are consuming GE foods. Though the Study shows that a significant amount of Americans do own a smartphone, it does not rectify the fact that 23% of Americans still do not.[78] Additionally, since 63% of small retailers lack Wi-Fi, a consumer with no data or poor service will either be unable to access information, or the small retailer will have to pay a significant amount of money to install and maintain Wi-Fi within the store.[79] Thus, using electronic or digital links could negatively impact both consumers and small retail store owners. Neither option, forcing a consumer to go without access to information or imposing a burden on small retail store owners, is consistent with the spirit of the NBFDA.

There is also a disparity in the age and socioeconomic status of Americans who own smartphones. According to the Study, 58% of Americans over sixty-five years old did not own a smartphone in 2016.[80] Additionally, 33% of those earning less than $30,000 a year did not own a smart phone.[81] These statistics show that where

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76. *See* 7 U.S.C.A. § 1639b(c) (West 2018); *see also* Charles, *supra* note 13 (explaining the controversy and compromises surrounding the electronic or digital link inclusion as an option for labeling under the NBFDA).

77. Greg Trotter, *Will Food Shoppers Really Seek Out GMO Information Using QR Codes?*, CHI. TRIB. (July 12, 2016, 1:44 PM), http://www.chicagotribune.com/business/ct-gmo-labeling-qr-codes-0713-biz-20160712-story.html ("QR codes could lead shoppers to far more information than what could be printed on a label without potentially stigmatizing food for ingredients that most scientists agree are not harmful.").

78. DELOITTE, *supra* note 68, at 46.

79. *Id.* at 67.

80. *Id.* at 48.

81. *Id.*

producers choose to use a QR code, the NBFDA will have a disparate impact on certain portions of society. Again, if the NBFDA does not equally provide access to all US citizens, the purpose of providing consumers access to information is not achieved.

Even where individuals have access to a smartphone, that does not mean they know how to use a QR code to easily access information about GE foods. Historically, guidelines pertaining to food labels have been aimed at making labels clear and easy to read.[82] Yet, in one survey, twenty-nine out of forty participants "did not even know what a QR code was."[83] Further, the applications designed to read QR codes are often difficult to use.[84] Thus, using QR codes does not necessarily comport with goals to make food labels clear and easy for consumers. If many consumers either do not know how to use a QR code or have difficulty using it, then the goal to provide accessible information about GE foods is not met through the NBFDA.

The capacity for consumers to know whether they are consuming GE foods is dependent on their ability to quickly access that information on a food package. Accordingly, the Study suggests that this third method of labeling GE foods—a QR code—is far less likely than text or symbols to achieve the NBFDA's overall purpose. This Study indicates that consumers would have insufficient access to GE food information. If, however, the Secretary concludes QR codes *are* sufficient to access GE information, the conclusion will further solidify the fundamental focus of this Comment. That is, instead of creating surface level fixes, the US must act in some way to tackle the deep-rooted concerns and perceptions which underline consumers' initial push toward GE food labeling. The NBFDA does not address these concerns.

B. Domestic Perceptions of GE Foods Will Not Change with the NBFDA Because the NBFDA Does Nothing to Educate Consumers About GE Foods

Although the NBFDA was partially inspired through consumer preference for GE food labeling, there is no clear indication that consumers understand what it means to eat GE food. According to one study, a majority of US consumers believe GE food is unsafe to eat.[85] The same study found that in a representative sample of scientists connected to the American Association for the

82. *See, e.g.*, *Nutrition Facts Label Programs and Materials*, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/Food/LabelingNutrition/ucm20026097.htm (last visited June 23, 2018) (explaining how the new Nutrition Facts Label is designed to "make it easier for consumers to make better informed food choices").

83. DELOITTE, *supra* note 68, at 43.

84. *Id.* at 50–53.

85. Cary Funk & Lee Rainie, *Public and Scientists' Views on Science and Society*, PEW RES. CTR. (Jan. 29, 2015), http://www.pewinternet.org/2015/01/29/public-and-scientists-views-on-science-and-society/ (describing that 57% of the general public says that genetically modified foods are generally unsafe to eat).

Advancement of Science ("AAAS"), 88% of AAAS scientists say GE foods are generally *safe* to consume.[86] This disparity between public perception and scientific evidence is a deep-rooted problem that the NBFDA does nothing to rectify.

The gap between consumer and scientific perception is more shockingly illustrated through an additional study comparing consumers' desire for mandatory GE labeling with a suggestion for labeling the presence or absence of DNA in food. According to another study, 84% of consumers support mandatory GE food labeling.[87] Just shy of that number, however, 80% of those surveyed also support a mandatory label for the *presence or absence of DNA in their food.*[88] This startlingly irrational and hypothetical policy proposal highlights the significant gap between citizen perception and scientific evidence regarding food labels.[89] The study reiterates the fact that requiring labeling for a concept that consumers know little to nothing about leads one to question the effectiveness of the NBFDA's solution. Rather, one should suppose the more important step would have been to educate consumers about GE foods in general, instead of mandating GE labeling and allowing consumers to stay ignorant about what GE actually means for food.

Even if there is no evidence that GE food is unsafe, it would seem that leaving consumers in the dark and allowing willing consumers to pay more for non-GE food products is harmless. Yet, in fact, past experience shows that there are adverse consequences to allowing inaccurate perceptions to drive consumer purchasing decisions.[90] The past marketing push to label milk products as "rbST-free" offers an example of these adverse consequences.[91]

In the early 2000s, consumers began an initiative to convince milk producers to label milk that came from cows given recombinant

86. *Id.*

87. Brandon R. McFadden & Jayson L. Lusk, *What Consumers Don't Know About Genetically Modified Food, and How that Affects Beliefs*, 30 FED'N AM. SOC'YS FOR EXPERIMENTAL BIOLOGY J. 3091, 3094 (2016).

88. *Id.*

89. *Id.* (stating that requiring labeling for the presence or absence of DNA would be an "absurd policy").

90. *See, e.g.*, Pamela Ronald, *How Scare Tactics on GMO Foods Hurt Everybody*, MIT TECH. REV. (June 12, 2014), https://www.technologyreview.com/s/528331/how-scare-tactics-on-gmo-foods-hurt-everybody/ (explaining how GMO fear increases food costs and endangers the health of disadvantaged populations).

91. *See* Andrew Martin & Andrew Pollack, *Monsanto Looks to Sell Dairy Hormone Business*, N.Y. TIMES (Aug. 6, 2008), http://www.nytimes.com/2008/08/07/business/07bovine.html (discussing consumer demand that led to the rbST-free campaign); *Monsanto Urges FDA to Stop "Misleading" rBST-free Labeling*, ORGANIC & NON-GMO REP. (May 2007), http://non-gmoreport.com/articles/may07/misleading_rBST-free_labeling.php (noting that Monsanto's actions to end the rbST-free labeling campaign started because they were losing business).

bovine somtatotropin ("rbST").[92] Bovine somtatotropin ("bST") is a hormone that increases production efficiency in dairy cows by stimulating milk production.[93] Cows naturally produce the hormone, but producers may also supplement rbST to increase efficiency and production levels.[94] Vast amounts of research has shown that there is no evidence rbST has adverse effects on lactating dairy cows.[95] Despite the scientific evidence to the contrary, consumers were convinced that rbST had adverse effects on cows and the safety of milk.[96] Consequently, consumers convinced the dairy industry to label milk as "rbST-free" when bST was not supplemented to cows.[97] The dairy industry has since articulated that the decision to label milk rbST-free was made entirely to meet consumer requests.[98] While at first this effort to appease consumers seemed harmless, the appeasement led to adverse results for major companies.

Labeling milk rbST-free, despite the hormone having no health consequences for humans or cows, has adversely impacted certain major companies in the US financially, including Monsanto Company ("Monsanto") and Elanco Animal Health ("Elanco"). The FDA approved Monsanto's injectable form of rbST, POSILAC, in 2006.[99] Then, in 2007, Monsanto sent letters to the FDA arguing that labeling products as rbST-free was false or misleading.[100] Following those letters, in 2008, Monsanto announced its intent to pursue divestiture of POSILAC.[101] Commentators postulated that this decision was because consumers were demanding more rbST-free dairy products.[102] Thus, the expensive process of developing POSILAC was

92. *See* Ross Pomeroy, *The Biggest Myth About rBST-Free Milk*, REALCLEAR SCI.: BLOG (Apr. 9, 2018), https://www.realclearscience.com/blog/2018/04/09/the_biggest_myth_about_rbst-free_milk.html.

93. *See* Normand R. St-Pierre et al., *Meta-analysis of the Effects of Somatribove Zinc Suspension on the Production and Health of Lactating Dairy Cows*, 245 J. AM. VETERINARY MED. ASS'N 550, 550 (2014).

94. Dale E. Bauman, *Facts About Recombinant Bovine Somatotrpopin* 2–3, https://ansci.cals.cornell.edu/sites/ansci.cals.cornell.edu/files/shared/documents/Recombinant%20Bovine%20Somatotropin_v3.pdf (last visited June 23, 2018).

95. *See* St-Pierre et al., *supra* note 93, at 562.

96. Andrew Martin, *Fighting on a Battlefield the Size of a Milk Label*, N.Y. TIMES (Mar. 9, 2008), http://www.nytimes.com/2008/03/09/business/09feed.html.

97. *Id.*

98. *See, e.g.*, *IDFA Position on Bovine Somatotropin (bST or bGH)*, INT'L DAIRY FOODS ASS'N, http://www.idfa.org/key-issues/labeling-standards/rbst (last visited June 23, 2018) (explaining that the FDA approved rbST use and that rbST labels were made in response to consumer requests).

99. *FDA Approves POSILAC® Production at Monsanto's Augusta Facility*, MONSANTO (Mar. 20, 2006), https://monsanto.com/news-releases/fda-approves-posilac-production-at-monsantos-augusta-facility/.

100. *See* Martin & Pollack, *supra* note 91.

101. *Monsanto to Pursue Divestiture of POSILAC*, MONSANTO (Aug. 6, 2008), https://monsanto.com/news-releases/monsanto-to-pursue-divestiture-of-posilac/.

102. *See* Martin & Pollack, *supra* note 91 (stating the decision came "as more retailers, saying they are responding to consumer demand, are selling dairy products from cows not treated with the artificial hormone"); *see also Monsanto*

not as profitable as Monsanto expected.[103] Elanco, a significant animal health business owned by Eli Lilly,[104] acquired POSILAC from Monsanto in 2008.[105] Yet in September 2017, Elanco announced that it was seeking a buyer for the product.[106] Compounding that announcement, Eli Lilly said that it was considering an initial public offering of Elanco.[107] Although there were hopes that Elanco's POSILAC purchase would increase its profits for Eli Lilly,[108] one can again postulate that these announcements indicate the purchase was not as profitable as anticipated.

This perceived loss of expected profits for Monsanto and Elanco is a telling sign of the consequences to an industry when food label claims do not inform consumers of a product's whole story. Science has shown nothing to indicate rbST is unsafe for cows or humans.[109] However, consumers requested rbST-free milk and the industry responded[110]—even though all cows naturally produce bST.[111]

Comparing these results with GE foods, we are now in a time when US consumers are requesting non-GE food. Though the average consumer has no idea whether GE food is unsafe,[112] and though there is overwhelming scientific evidence to trust GE foods,[113] consumers have nevertheless demanded GE-labeled food. Congress responded with the NBFDA, mandating GE labels for food. Seemingly to soften the impact this mandate might have on producers, Congress provided the option to label food with unobtrusive QR codes.[114] Congress may have hoped that these QR codes would go unnoticed by most consumers, thus preventing adverse impact on companies which

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Urges FDA to Stop "Misleading" rBST-free Labeling, *supra* note 91 (stating that Monsanto's actions started because they were losing business).

103. *See* Martin & Pollack, *supra* note 91.

104. *See About Elanco*, ELANCO, https://www.elanco.com/about/ (last visited June 23, 2018).

105. Dave Natzke, *Elanco Seeking to Sell Posilac Production Facility*, PROGRESSIVE DAIRYMAN (Sept. 29, 2017), https://www.progressivedairy.com/news/industry-news/elanco-seeking-to-sell-posilac-production-facility.

106. Joe Hotchkiss, *Pharmaceutical Company Seeking Buyer for Local Plant*, AUGUSTA CHRON. (Oct. 12, 2017, 12:18 PM), http://www.augustachronicle.com/news/business/2017-10-12/pharmaceutical-company-seeking-buyer-local-plant; Natzke, *supra* note 105.

107. *Lilly Mulls Sale, IPO of Animal Health Business, Hikes Full-year Forecast*, CNBC (Oct. 24, 2017, 7:13 AM), https://www.cnbc.com/2017/10/24/eli-lilly-beats-profit-estimates-mulls-sale-of-animal-health-business.html.

108. J.K. Wall, *Lilly Hopes Elanco Unit Becomes a Cash Cow*, INDIANAPOLIS BUS. J. (May 8, 2010), https://www.ibj.com/articles/19823-lilly-hopes-elanco-unit-becomes-a-cash-cow.

109. Pomeroy, *supra* note 92.

110. *Id.*

111. *Id.*

112. *See supra* notes 38, 85 and accompanying text.

113. *See supra* note 85 and accompanying text.

114. *See* 764 CONG. REC. H4935 (daily ed. July 14, 2016) (statement of Rep. Newhouse).

produce GE foods. However, Congress has still appeased potentially unknowledgeable consumers with a mandate that allows consumers to continue believing that there is a health difference between GE food and non-GE food.[115] Though there is nothing wrong with consumers making an informed decision to purchase non-GE food, there is something amiss when a consumer chooses to do so based off unfounded fear alone. If consumers have a lack of understanding about what GE food *is*, the NBFDA will perpetuate these sorts of uninformed decisions.[116]

Many may see consumers' decisions to purchase non-GE food as seemingly harmless, but they are not. The impact rbST-free labeling had on substantial companies such as Monsanto and Elanco should illustrate why it is important that producers do not merely succumb to consumer demands for labeling without addressing an underlying lack of scientific bases for the demands. If there were such adverse effects on major companies like Monsanto and Elanco through a *voluntary* labeling initiative, one can only imagine what effect this new *mandated* labeling scheme may have on companies producing food with GE ingredients. Thus, rather than attempting to "hide" GE labels with a QR code, perhaps Congress should have considered how to educate consumers more about the actual product.

V. THE NBFDA WILL DO LITTLE TO IMPROVE THE UNITED STATES' INTERNATIONAL CONFLICTS REGARDING GE FOODS BECAUSE THE CONFLICTS ARE ENTRENCHED IN DIFFERING OPINIONS ON WHETHER GE FOODS ARE SAFE

The NBFDA shows how the US approaches GE discussions from a very different perspective than other countries. The NBFDA's surface level fix does little to address other countries' underlying concerns regarding GE foods, just as it fails to address domestic consumers' concerns. Additionally, the NBFDA shows how this difference in mindsets will likely have long-term impacts on international trade and global food security. This Part will compare

115. *See* Ben-Shahar, *supra* note 41.

116. This also leads one to question the wisdom of allowing companies to write "gmo-free" or "non-gmo" on their products. *See generally* U.S. FOOD & DRUG ADMIN., GUIDANCE FOR INDUSTRY: VOLUNTARY LABELING INDICATING WHETHER FOODS HAVE OR HAVE NOT BEEN DERIVED FROM GENETICALLY ENGINEERED PLANTS (2015), https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm059098.htm. While this issue exceeds the scope of the present Comment, it appears that other countries are concerned about this voluntary labeling option as well. *See, e.g.*, LIBRARY OF CONG., RESTRICTIONS ON GENETICALLY MODIFIED ORGANISMS 120–22 (2014), https://www.loc.gov/law/help/restrictions-on-gmos/restrictions-on-gmos.pdf (quoting Article 7 of Fresh Produce Quality Labeling Standards (Labeling Standards on GM Food Set by Minister of MAFF) MAFF Notification No. 517 of 2000, *last amended by* MAFF Notification No. 9 of 2011) (placing cautious restrictions on when it is appropriate to label something non-GE because of the misleading effect it can have on public perception).

the US' views on GE foods with other countries', most notably the European Union ("EU"). Additionally, it will show how mandatory labeling may slightly improve trade but will ultimately do little to solve the longstanding international disagreements regarding GE foods. Finally, this Part will discuss why a surface level fix with GE food labeling will also do little to improve global food availability.

A. The EU Treats GE Foods with More Caution than the US

The US has long treated GE foods differently than other countries, which is evidenced in the stark regulatory contrasts between the US and the EU. For many years the FDA, USDA, and EPA conducted pre-market testing for GE foods in the US, but once the food was approved it was treated the same as other non-GE food.[117] It is only due to consumer requests for mandatory labeling that the US is changing this policy.[118] In contrast, the EU has taken a proactive role to "control the spread of [GE]."[119] EU policies regarding GE foods were founded in the 1990s on the "precautionary principle."[120] This means that protective action is taken before there is *any* scientific proof of risk, thus there are very strict hurdles a GE food must overcome before a producer can market the product.[121]

Even once GE food is pre-market approved, the EU has very strict labeling protocols.[122] The EU has long had specific standards for labeling GE foods.[123] Importantly, "the words 'genetically modified' or 'produced from genetically modified (name of the organism)' must appear" on the package.[124] Additionally, these standards prohibit importation of non-labeled GE food and also allow a temporary ban on a GE food product if risk to human health or the environment is exposed.[125] These differences in pre-market regulations and labeling evidence two distinct approaches to GE foods. They illustrate the EU's strict regulatory scheme versus the US' slightly more laissez-faire approach. Because the EU has more strict GE food regulations than the US, it has led to trade barriers between the US and EU.

The EU's strict regulations on GE foods lead to a trade barrier where the US is disadvantaged because of its looser regulatory

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117. Katharine Gostek, *Genetically Modified Organisms: How the United States' and the European Union's Regulations Affect the Economy*, 24 MICH. ST. INT'L L. REV. 761, 770–71 (2016).

118. *See supra* Part III.A.

119. Debra M. Strauss, *Genetically Modified Organisms in Food: A Model of Labeling and Monitoring with Positive Implications for International Trade*, 40 INT'L LAW. 95, 105 (2006).

120. Gostek, *supra* note 117, at 772.

121. *Id.*

122. *Id.*

123. Commission Regulation 1829/2003, arts. 12–14, 2003 O.J. (L 268) 1, 11–12 (EC).

124. *Id.* at 11.

125. Strauss, *supra* note 119, at 106.

scheme. Stricter GE food regulations mean that the EU has fewer barriers to export its own goods.[126] Meanwhile, the US has far more barriers for exportation into the EU.[127] This unreciprocated trade impediment between the US and EU means that the EU is far less reliant on US agricultural products than on other countries' more traditional agricultural products.[128] Thus, while loose regulations in the US may benefit US farmers and consumers domestically, they create difficulties for international trade.

GE food labeling has specifically contributed to trade difficulties between the US and EU. One barrier for US exports to the EU was lack of GE labels on US goods.[129] Therefore, in some ways the NBFDA should alleviate these difficulties.[130] However, the NBFDA's labeling requirements are different than the EU's.[131] The NBFDA does not require actual words to signify GE products.[132] Yet the EU requires actual words on its GE labels—a QR code is inadequate.[133] Though producers attempting to export to Europe will have to follow EU regulations for labeling,[134] more notably, this seems to show that the US has placed a lower level of importance on mandatory labels.

If the EU requires actual words stating that the product is GE, as opposed to a QR code, one can presumptively speculate that the EU places greater emphasis on the labels and the *differences* between traditional and GE foods. Mandatory labeling in the US may temporarily aid in the facial trade difficulties stemming from the US' lack of GE labels. However, QR codes show that the US treats the differences between GE foods and traditional foods lightly. Essentially, failing to require actual words on packages shows that the US does not think the difference between GE foods and traditional foods is significant enough for consumers to *need* to know about it. It indicates that a QR code is enough for consumers who *want* to know. This is very different from the EU. It appears that the US perceives a lower level of risk associated with GE foods as compared to the EU. Therefore, mandatory labeling in the form of QR codes will not change the baseline differences in perception between the US and EU.

There is less demand for GE food products in Europe[135] because of these differences in perception, and the NBFDA will do little to change the lack of demand. Cultural differences between US and EU food consumption extend deeper than the GE food labeling campaign. In Europe, there is less demand for GE products "because European

126. Gostek, *supra* note 117, at 788.
127. *See id.*
128. *See id.* at 788, 792.
129. McAllister, *supra* note 35, at 139.
130. *Id.*
131. *Id.* at 141.
132. *See supra* Part III.B.
133. *See supra* notes 109–110 and accompanying text.
134. McAllister, *supra* note 35, at 141.
135. Gostek, *supra* note 117, at 786.

consumers prefer food that is 'natural'" over GE food.[136] Many Europeans consider GE foods inferior to conventional foods.[137] In fact, due to the skepticism surrounding GE foods, even where GE crops have passed the stringent EU approval process, individual member states have banned their cultivation.[138] Major countries have chosen to ban GE products, including Switzerland, France, Austria, and Italy.[139] Thus, GE food products' success or failure does not depend on market approval but on the general acceptance of the product.[140] If major European countries banned cultivation of GE crops, regardless of EU approval, then adding a mandatory label to GE foods will not alter Europeans' underlying perception of GE foods.

B. Countries Outside the EU Also Treat GE Foods More Cautiously than the US

Other countries also have mandated labeling, so it is important to note how the US' new labeling system compares to countries outside the EU. Over sixty countries have mandatory food labeling.[141] Outside the EU, major countries that mandate GE labeling include China, Japan, South Korea, and Russia.[142] While the format of GE labels varies by country, other countries require actual words alerting consumers to GE food ingredients.[143] For example, Japan requires the words "GM Ingredients," or "GM Ingredients Not Segregated."[144] China requires that labels clearly indicate the names of raw materials containing genetically modified ingredients.[145] South Korea also

136. *Id.*
137. *Id.* at 790.
138. *See id.* at 775–76.
139. *Id.* at 762.
140. *Id.* at 798.
141. Andrea Rock, *Where GMOs Hide in Your Food*, CONSUMER REPORTS (Oct. 2014), https://www.consumerreports.org/cro/2014/10/where-gmos-hide-in-your-food/index.htm; *64 Countries Label GMOs. Guess Which One Doesn't?*, FOOD & WATER WATCH (Feb. 29, 2016), https://www.foodandwaterwatch.org/impact/64-countries-label-gmos-guess-which-one-doesn%E2%80%99t (listing major countries that require labeling and providing a link to the comprehensive list).
142. FOOD & WATER WATCH, *supra* note 141.
143. *See, e.g.*, *How Are GMOs Labeled Around the World?*, GMO LITERACY PROJECT, https://gmo.geneticliteracyproject.org/FAQ/how-are-gmos-labeled-around-the-world/ (last visited June 23, 2018) (explaining that some countries require the label be placed *within* the food ingredient list, while other countries allow more conspicuous locations).
144. *Restrictions on Genetically Modified Organisms: Japan*, LIBRARY OF CONG., https://www.loc.gov/law/help/restrictions-on-gmos/japan.php (last updated June 9, 2015) (citing Labeling Standards on GM Food Set by Minister of MAFF Based on Article 7, Paragraph 1 of Processed Food Quality Labeling Standards and Article 7, Paragraph 1 of Fresh Produce Quality Labeling Standards (Labeling Standards on GM Food Set by Minister of MAFF), MAFF Notification No. 517 of 2000, *last amended by* MAFF Notification No. 9 of 201).
145. *Restrictions on Genetically Modified Organisms: China*, LIBRARY OF CONG., https://www.loc.gov/law/help/restrictions-on-gmos/china.php (last

requires actual words and further requires that GE labels are eye catching.[146] This exemplifies that other major countries outside the EU also have stricter labeling requirements for GE foods than the US. If the US' mandatory labeling scheme is insufficient for the EU, and other countries have similar laws to the EU, then one might deduce that the US' lax labeling requirements will prove insufficient for other countries in the future. Therefore, the difference between US perceptions over GE food extends to countries outside the EU.

Similar to the EU, other countries also take careful precautions when making legislative decisions on GE products. A few examples come from China, Russia, and Zambia.[147] China has regulated the import approval process of GE products due to "low public acceptance" of a GE food.[148] Additionally, in 2016, Russia established a ban on growing and producing genetically modified organisms.[149] It appears that the intent of this law was to stop production of food which contained GE elements.[150] Recently, Zambia has attracted attention for its strict and precautious policy decisions regarding GE foods.[151] Further, two countries have an absolute ban on GE foods: Benin and Serbia.[152] These countries show that the concerns surrounding GE foods are expressed in both developed and developing countries.

The US' market for GE foods is not as dependent on developed countries as it is on developing countries.[153] Because of developed

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updated June 9, 2017) (citing 农业转基因生物安全管理条例 [Regulations on Administration of Agricultural Genetically Modified Organisms Safety] (promulgated by State Council May 23, 2001, revised Jan. 8, 2011)) [hereinafter GMO Regulations].

146. LIBRARY OF CONG., RESTRICTIONS ON GENETICALLY MODIFIED ORGANISMS 191 (2014), https://www.loc.gov/law/help/restrictions-on-gmos/restrictions-on-gmos.pdf; *see also* Foreign Agricultural Service, *Regulations / Policies*, U.S. AGRIC. TRADE OFFICE, http://www.atoseoul.com/information/regulations_policies_01.asp#Regulatory%20Agencies%20in%20Korea (last visited June 23, 2018).

147. LIBRARY OF CONG., *supra* note 146 (reporting on other countries' GMO restrictions, including China and Russia); Zachary Stieber, *GMOs, A Global Debate: Zambia, Strongest Anti-GMO Stance in Africa*, EPOCH TIMES (Sept. 7, 2013, 6:35 AM), https://www.theepochtimes.com/gmos-a-global-debate-zambia-strongest-anti-gmo-stance-in-africa_280808.html.

148. *China Cites Public Opinion in GMO Soybean Approval Delay*, AGWEEK (Sept. 26, 2014, 10:00 AM), http://www.agweek.com/business/agriculture/3793369-china-cites-public-opinion-gmo-soybean-approval-delay; *see also* LIBRARY OF CONG., *supra* note 145.

149. Peter Roudik, *Russia: Full Ban on Food with GMOs*, GLOB. LEGAL MONITOR (July 1, 2016), http://www.loc.gov/law/foreign-news/article/russia-full-ban-on-food-with-gmos/.

150. *Id.*

151. *Is Zambia Being Too Hard on GMOs?*, ZAMBIA DAILY MAIL (Oct. 31, 2017), https://www.daily-mail.co.zm/is-zambia-being-too-hard-on-gmos/.

152. *Genetically Engineered Food Labeling Laws*, CTR. FOR FOOD SAFETY, https://www.centerforfoodsafety.org/ge-map/ (last visited June 23, 2018).

153. *See, e.g.*, FERNANDEZ-CORNEJO ET AL., *supra* note 28, at 37 (finding that people in developing countries are more receptive to buying and consuming GE foods).

countries' trade restrictions or general lack of need for GE food, the US must look to other countries as destinations for its GE agricultural exports.[154] Based on the current market demand, the US finds a willingness to pay for GE foods in developing countries.[155] Consequently, developing countries' views on GE foods are just as important to US international trade as developed countries. Paying heed to the perceptions that developing countries hold regarding GE foods will be vital for US agriculture in the future.

C. The Various Perceptions About GE Foods Could Impact Future Global Food Security

Public acceptance of GE foods is important for more reasons than just how it affects US trade—it is important for global food security. In the past, because of the fear that surrounds GE foods, some countries have chosen to reject receiving GE food as food assistance, even in times of famine.[156] Currently, GE foods are becoming an important part of meeting food demands in countries with food insecurity.[157] In the future, it is likely that GE foods will be necessary in order to meet global food demands.[158] The US could encounter difficulties in aiding impoverished countries if the perceptions surrounding GE foods do not change.

As the world population increases, the need for some sort of food assistance in many countries will increase. A top-down approach to world hunger is to simply give food to developing countries.[159] However, a better solution is to provide food insecure countries with the means to grow their own food.[160] Rural communities in Sub-Saharan Africa "comprise the most food deprived communities in the world."[161] These communities also have harsh climate and soil conditions that make the environment unfavorable for producing food.[162] However, GE crops provide a solution to this problem.[163] GE technology enables seeds to be developed that can withstand the

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154. *See* Gostek, *supra* note 117, at 793 (explaining that China has no need for excess supplies of GE corn, and the EU's strict regulations prevent the EU from being a major import destination for US supplies).

155. FERNANDEZ-CORNEJO ET AL., *supra* note 28, at 37.

156. Meron Tesfa Michael, *Africa Bites the Bullet on Genetically Modified Food Aid*, WORLDPRESS.ORG (Sept. 26, 2002), http://www.worldpress.org/Africa/737.cfm; *see also* TH Lee et al., *supra* note 38, at 291.

157. *See generally* Luis Herrera-Estrella & Ariel Alvarez-Morales, *Genetically Modified Crops: Hope for Developing Countries?*, 21 EUR. MOLECULAR BIOLOGY ORG. REPS. 256 (2001) (explaining that opposing GE crops ignores the needs of developing countries and will have negative impacts on food availability).

158. *See id.*; *see also supra* notes 29–31 and accompanying text.

159. Frank Tenante, *Feeding the World One Seed at a Time: A Practical Alternative for Solving World Hunger*, 5 NW. U. J. INT'L HUM. RTS. 298, 310 (2007).

160. *Id.* at 313.

161. *Id.* at 310.

162. *Id.* at 314.

163. *Id.* at 314–15.

harsh environment.[164] Traits, such as allowing crops to grow while requiring less water and still improving yield production, are possible with genetic engineering.[165] Thus, GE crops can provide the food assistance that many individuals desperately need.

Unfortunately, opponents to GE crops disapprove of using them to relieve world hunger. Those opposed to GE crops argue against using GE crops in developing countries essentially because the EU maintains such strict regulations.[166] One commentator went so far as to say that EU policy is starving Africa.[167] The counterargument to using GE crops in developing countries is that using GE crops may decrease a country's export opportunity to the EU or to other countries that have similarly strict regulations on GE foods.[168] However, the ideal result is that cultivating GE crops in developing countries would prompt Europe to consider opening its borders to more GE crops in the future.[169] Proponents of improving food availability will continue to advocate for the use of GE crops in developing countries.

Although not all developing countries facing food insecurity have embraced GE foods, some have begun to do so. In October 2017, the Parliament of Uganda passed the National Biosafety Bill in an effort to improve access to GE plants.[170] One goal the Minister of Science, Technology and Innovations mentioned after passing the bill was to "alleviate [ ] farmers from the devastation and impoverishment often caused by crop diseases, animal diseases, uncontrolled use of expensive pesticides and unpredictable weather and drought occasioned by climate change."[171] Meanwhile, in Ghana, controversy surrounded the Ghana Plant Breeders Bill, which would improve access to GE crops.[172] A former Director of Ghana's Council for Scientific and Industrial Research called for immediate passage, referencing food insecurity as a main reason.[173] Yet at the same time,

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164. *Id.* at 315.

165. *Id.* at 315–16.

166. *See id.* at 304; Calestous Juma, *How Europe is Starving Africa by Blocking GMOs*, GENETIC LITERACY PROJECT (Oct. 27, 2015), https://geneticliteracyproject.org/2015/10/27/europe-starving-africa-blocking-gmos/.

167. *See* Juma, *supra* note 166.

168. *See Passing of "GMO Bill" Sparks Controversy in Uganda*, FRESH PLAZA (Nov. 2, 2017), http://www.freshplaza.com/article/184243/Passing-of-GMO-Bill-sparks-controversy-in-Uganda.

169. Tenante, *supra* note 159, at 319.

170. Hillary Muheebwa, *Uganda Parliament Passes Bill To Promote Use of Genetically Modified Materials, Biotech*, INTELL. PROP. WATCH (Nov. 3, 2017), http://www.ip-watch.org/2017/11/03/uganda-parliament-passes-bill-promote-use-genetically-modified-materials-biotech/.

171. *Id.*

172. *See* Nana Konadu-Agyemen, *Pass Plant Breeders Bill Now – Parliament Urged*, GRAPHIC ONLINE (Nov. 5, 2017, 10:51 AM), https://www.graphic.com.gh/news/general-news/pass-plant-breeders-bill-now-parliament-urged.html.

173. *Id.*

Ghanaian activists have argued against the bill, saying that GE crops would exploit poor farmers.[174]

In order to solve food availability concerns, discussions must center on whether GE crops are acceptable for use, because it appears that GE is the most viable solution to food insecurity.[175] Returning to the NBFDA's surface level fix, the fact that the US allowed a QR code for mandatory GE labeling seems to indicate that instead of addressing the negative connotations that inundate GE foods, the US attempted to hide the problem through an unnoticeable labeling method. Therefore, the NBFDA did nothing to educate consumers on the use of GE foods within the US' own territory, let alone *outside* US territory. The federal government submitted to consumer pressures surrounding GE food use in the US. Thus, the NBFDA will in no way advance the idea that GE food is the solution to world hunger.

VI. THE US MUST MOVE BEYOND THE NBFDA'S "QUICK FIX" TO CHANGE THE PERCEPTIONS SURROUNDING GE FOODS

As noted in Part II, there are numerous beneficial reasons to use GE crops. Additionally, there is little reason to believe that foods made with GE crops pose serious health risks to the public.[176] Even so, consumers continue to fear GE foods due to the unknown scientific process of developing them and the agencies' process of approving them.[177] For some time, the US government avoided the issue and allowed producers to voluntarily label GE foods.[178] Mandatory GE labeling was opposed because GE food labels encourage consumers to continue thinking there are health risks associated with GE foods.[179] However, after a long pro-labeling initiative, states began to take their own action.[180] Because of concern over a patchwork of inconsistent state labeling laws, Congress took preemptive action and created the NBFDA to appease consumers nationwide.[181] Congress attempted to mute the negative stigma associated with GE foods by

174. *Don't Pass Plant Breeders Bill – Samia Appeals to Parliament*, GHANA WEB (Nov. 8, 2017), https://www.ghanaweb.com/GhanaHomePage/NewsArchive/Don-t-pass-Plant-Breeders-Bill-Samia-appeals-to-Parliament-598329.

175. Temesgen Deressa, Jessica Pugliese, & Mwangi S. Kimenyi, *Genetically Engineered Crops: Key to Climate Adaption and Food Security in Africa?*, BROOKINGS (Sept. 4, 2014), https://www.brookings.edu/blog/africa-in-focus/2014/09/04/genetically-engineered-crops-key-to-climate-adaptation-and-food-security-in-africa/.

176. *See supra* notes 43–44 and accompanying text.

177. *See supra* notes 4–5, 39–40, 43 and accompanying text.

178. *See supra* notes 18, 46–47 and accompanying text (highlighting that GE crops became popular in the early 1990s but that Congress did not begin discussing labeling such crops seriously until 2014).

179. Nosowitz, *supra* note 40.

180. McAllister, *supra* note 35, at 134–35 (listing Vermont, Maine, and Connecticut as states with GE labeling laws in place while also referencing other states that had begun proposed legislation for GE labeling).

181. *See supra* note 47 and accompanying text.

allowing QR codes to meet the mandatory labeling requirements.[182] Since QR codes have no words alerting consumers about GE ingredients contained in the food,[183] QR codes only signal that the food may contain GE ingredients to the most conscientious consumers. Less conscientious consumers could continue on—oblivious to the fact that the food may contain GE ingredients.

It appears that QR codes were Congress' attempt to dampen the effect that mandatory labeling would have on the domestic GE food market. However, this attempt seems to indicate that Congress thought it could solve the problems related to GE foods with a surface level fix. Yet the QR codes do not address consumers' perception that there is something *wrong* with eating GE foods. So, the only impact the NBFDA will have is to temporarily slow the debate about whether GE foods are safe. The underlying problem is that consumers need further education about GE foods. Studies indicate that consumers do not understand enough about GE foods to make an informed decision about whether to eat them or not.[184] This is perfectly acceptable if consumers make an educated decision to avoid eating GE foods. Nonetheless, in today's society, consumer choices to avoid GE foods seem driven more through a fear factor than an educated decision. Therefore, the actual solution to this problem is not in placing QR codes on food labels, but in improving public education.

Compounding the negative stigma regarding GE foods in the US is the fact that these issues are international as well. The debate surrounding GE foods is strongest between the US and EU. The US' shortcoming in not requiring GE food labels prior to the NBFDA presented trade barriers with the EU.[185] However, there are additional trade barriers due to the EU's extremely strict pre-market approval process.[186] Consequently, even though the NBFDA will solve the labeling issue, it will not generate a solution to the other trade barriers that presently exist between the US and EU. The deeper issue is that the EU is far more cautious about consuming GE foods and, due to this caution, there is much less demand for GE food in Europe.[187] The only solution is continued scientific research, which can result in further public education, to ensure that GE foods are definitively safe to eat. Additionally, continued collaboration with the EU is necessary to come to an agreement about GE foods.

The debate about whether GE foods are safe extends to countries beyond the EU as well. Many other countries share the EU's concerns over GE food. The more disconcerting issue, though, is that developing countries with diminished food security are not always

182. *See supra* notes 10–12 and accompanying text.
183. *See supra* note 13 and accompanying text.
184. *See* discussion *supra* Part IV.B.
185. Gostek, *supra* note 117, at 788.
186. *See supra* notes 117–25 and accompanying text.
187. *See supra* notes 135–40 and accompanying text.

receptive to GE foods.[188] This is perturbing because GE crops and foods are an efficient and cost-effective tool to improve food availability and, as the world population increases, GE crops will likely become progressively more vital. In fact, GE crops may be the only effective way to fight world hunger in the future.[189] Again, the NBFDA will do nothing to combat these issues, and the debate over whether developing countries should use GE foods will endure. Addressing these affairs is important to ensure that, as the world population increases, we have the ability to harvest enough food for the whole population.

VII. CONCLUSION

In conclusion, the NBFDA passed in 2016 was barely satisfactory for appeasing consumers' request for GE labeling. More importantly, however, it was not sufficient in addressing the actual reason consumers requested the mandatory labels—which is the fear that GE foods are in some way different and less safe than traditional, non-GE foods. Congress attempted a "quick fix" with the NBFDA, but this fix highlights the underlying problem, which is that Congress was circumventing the fears surrounding GE foods instead of addressing them head on. To resolve domestic consumer perceptions, reduce international trade barriers, and assure food availability, the US needs continued scientific research, education, and collaboration between consumers and international communities. Quick response codes are not a quick enough fix to the GE conflict, and it is vital that our nation confronts the deep-rooted issues that encapsulate this GE food labeling debate.

*Katherine Wenner**

188. FERNANDEZ-CORNEJO ET AL., *supra* note 28, at 37.

189. *Cf.* Deressa, Pugliese, & Kimenyi, *supra* note 175 (explaining the benefits of GE crops in Africa as the best option in the face of environmental challenges and food insecurity).

* J.D., 2019, Wake Forest University School of Law. First, it is of paramount importance to thank my parents for relentlessly, yet lovingly, berating my writing in high school and college to help me become the professional I am today. Next, I must thank Professor Abigail Perdue for patiently teaching me everything I know about legal writing. I also wish to thank Professor Vanessa Zboreak for listening to my ramblings about the NBFDA. Lastly, I will end with this quote from Abdu'l-Bahá: "Sometimes I want to ask God why He allows so much poverty, famine, and injustice when He could do something about it, but I'm afraid He might just ask me the same question." Food security will always remain in the forefront of my mind, and this Comment is the beginning of a lifelong journey to "do something about it."