# EXAMINATION OF THE COSTS AND IMPACTS OF MANDATORY BIOTECHNOLOGY LABELING LAWS

## HEARING

BEFORE THE

## COMMITTEE ON AGRICULTURE
## HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

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WITNESSES



SUBMITTED MATERIAL

# EXAMINATION OF THE COSTS AND IMPACTS OF MANDATORY BIOTECHNOLOGY LABELING LAWS

**TUESDAY, MARCH 24, 2015**

HOUSE OF REPRESENTATIVES,
COMMITTEE ON AGRICULTURE,
*Washington, D.C.*

The Committee met, pursuant to call, at 10 a.m., in Room 1300 of the Longworth House Office Building, Hon. K. Michael Conaway [Chairman of the Committee] presiding.

Members present: Representatives Conaway, Neugebauer, Lucas, Gibbs, Austin Scott of Georgia, Crawford, Gibson, Hartzler, Benishek, Denham, LaMalfa, Davis, Yoho, Allen, Bost, Rouzer, Abraham, Emmer, Moolenaar, Newhouse, Peterson, David Scott of Georgia, Costa, Walz, McGovern, DelBene, Vela, Kuster, Nolan, Bustos, Kirkpatrick, Aguilar, Plaskett, Adams, Graham, and Ashford.

Staff present: Haley Graves, Jackie Barber, Jessica Carter, John Goldberg, Mary Nowak, Mollie Wilken, Patricia Straughn, Scott C. Graves, Ted Monoson, Faisal Siddiqui, John Konya, Keith Jones, Liz Friedlander, and Nicole Scott.

## OPENING STATEMENT OF HON. K. MICHAEL CONAWAY, A REPRESENTATIVE IN CONGRESS FROM TEXAS

The CHAIRMAN. Good morning. I want to thank each of you for being here today to discuss agricultural biotechnology.

Mankind has used biological technologies for more than 10,000 years to improve crops and livestock, to make useful food products, such as bread and cheese, and to preserve dairy products. When applied to plant breeding, these technologies have led to the evolution of nearly every food product we consume. These and other advances have enabled us to enjoy the safest, highest-quality, most abundant and affordable supply of food and fiber.

As our knowledge has increased, so has the speed and precision in which we are able to harness natural capabilities to improve the plants we cultivate. These new applications of biotechnology have been available to American and international consumers for nearly 3 decades. The safety of the technology has been confirmed by the world's leading scientific and public health organizations including the World Health Organization, the National Academies of Science, the American Association for the Advancement of Science, the American Medical Association, and the Royal Society of Great Britain.

Many scientists and farmers are optimistic and enthusiastic about the prospects of using scientific advances in biotechnology. The careful and precise addition of one or a few genes to a plant may make it more productive and nutritious, more tolerant to environmental stresses such as drought, and more resistant to disease and pests. These technologies can likewise improve the efficiency and therefore the productivity of agriculture, while at the same time reducing detrimental effects on the environment.

This Committee has frequently reviewed these technologies. We have reviewed the regulatory mechanisms in place since the Reagan Administration and have been repeatedly assured by the absence of any valid concerns regarding the safety or quality of products derived from these production methodologies. Despite the facts that are universally on the side of this technology, we would have to search long and hard to find another issue matching the negative rhetoric and aggressive tactics of the detractors. In Washington and across the country, we are hearing a great deal of misinformation about so-called GMOs and the use of biotechnology in food and agricultural production. These unfounded attacks are not supported by the facts and mislead both consumers and policymakers. This misinformation would threaten our farmers' ability to feed an ever-growing population and result in higher food costs for consumers.

Biotechnology is an essential tool for farmers to have in the toolbox if we plan to feed an estimated ten billion people by the year 2050 in an environmentally sound, sustainable, and affordable way. Unfortunately, threats exist to our ability to fully utilize this technology in the form of proposed Federal and state laws, as well as some state laws that will soon be implemented if we don't act.

A recent report by the Cornell Business School examined the consumer cost impact of a proposed mandatory label for biotechnology food products sold in the State of New York. According to the study, implementing a mandatory biotech labeling system in the state would mean new costs for consumers in the checkout aisle. The report finds that a family of four in New York could pay on average an additional $500 in annual food costs if mandatory labeling becomes the law. The state would also incur an estimated $1.6 million in costs from the writing and enforcing of new regulations and litigating potential lawsuits related to mandatory labeling, which could run as high as $8 million and will also factor into the increased costs consumers see in their annual food bills. What this report does not reflect is the significant cost to food manufacturers associated with segregation and testing that would be passed back to producers, nor does it address liability costs borne by food processors and producers under the activist scheme.

As of today 26 states have some form of biotech labeling legislation pending. These proposals are loaded with arbitrary and inconsistent policies which would create an unmanageable situation for food producers, processors, and distributors. Consumers would ultimately lose as a result both of higher food costs and the very real likelihood that the technological innovation that has filled our grocery stores with an abundance of high-quality products we enjoy would be stifled. As we examine the costs and impacts if states like Vermont move forward with mandatory labeling schemes, I think

we will agree that Congressional action to preserve interstate commerce through national uniformity is necessary.

Although I will introduce our panel in its entirety after opening statements, I do want to take a moment to discuss one of our witnesses. Ms. Joanna Lidback is a dairy farmer from the State of Vermont and the author of a well-read blog on farming, food, and rural issues. This is actually Ms. Lidback's second appearance before the Agriculture Committee to discuss biotechnology. I would be remiss if I didn't acknowledge Joanna's courage in returning since some of you may be aware that after her appearance last year, Joanna and her family were the subject of harassment, interfering with her young family's peace. I consider the tactics of anti-biotech activists who harassed you reprehensible, and I want to stress that this shameful behavior is not acceptable and should not be tolerated.

Joanna, thank you for being here today and for your dedication to this important issue.

[The prepared statement of Mr. Conaway follows:]

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In Washington and across the country, we are hearing a great deal of misinformation about so-called "GMOs" and the use of biotechnology in food and agricultural production. These unfounded attacks are not supported by the facts and mislead both consumers and policymakers. This misinformation could threaten our farmers' ability to feed an ever-growing population and result in higher food costs for consumers.

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Although I will introduce our panel in its entirety after opening statements, I do want to take a moment to discuss one of our witnesses . . .

Ms. Joanna Lidback is a dairy farmer from the State of Vermont and the author of a well-read blog on farming, food and rural issues. This is actually Ms. Lidback's second appearance before the Agriculture Committee to discuss biotechnology. I would be remiss if I didn't acknowledge Joanna's courage in returning since some of you may be aware that after her appearance last year, Joanna and her family were the subject harassment, interfering with her young family's peace.

I consider the tactics of the anti-biotech activists who harassed you reprehensible, and I want to stress that this shameful behavior is not acceptable and should not be tolerated. Joanna, thank you for being here today and for your dedication to this important issue.

The CHAIRMAN. And with that, I recognize the Ranking Member for his statement.

## OPENING STATEMENT OF HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

Mr. PETERSON. Thank you, Mr. Chairman, and thanks for holding this hearing. This is an issue that I hope that we can find a way to address because if we don't, we are going to have 50 states with 50 different labeling programs, and that is just not going to work. If we don't do something to stop this, we could end up with something similar to what is going on right now in California with their egg standards.

Consumers have expressed their interest in knowing more about where their food comes from, and that is a good thing. But when it comes to labeling, we need to be able to find a smart way to balance this consumer demand, what we know about the safety of the foods that our farmers produce. Done correctly, I think we can find a workable solution.

The Energy and Commerce Committee has most of the jurisdiction here, so at this point our hands are a little bit tied. But I do think it is important for us to move forward and learn more about the impacts some of these state attempts at labeling genetically engineered food and food ingredients are going to have.

So I look forward to hearing from our witnesses and thank you for holding the hearing.

The CHAIRMAN. I thank the Ranking Member. I appreciate that. I recognize Subcommittee Chairman Rodney Davis for his statement.

**OPENING STATEMENT OF HON. RODNEY DAVIS, A REPRESENTATIVE IN CONGRESS FROM ILLINOIS**

Mr. DAVIS. Thank you, Mr. Chairman, and thank you to all the witnesses that are here today. And Mr. Chairman, thank you for holding this hearing on the costs and impacts of the mandatory biotech labeling laws. And I would like to welcome one of my constituents who is on the panel, Mr. Lynn Clarkson. I am very glad you are here representing the small town of Cerro Gordo very, very well.

Clarkson Grain, your company, turned 40 just last year, supplies grain to food manufacturing, animal feed industries. His products include corn, whole grains, and non-GMO grains and oilseeds. I appreciate your testimony about respecting all viewpoints and lowering the temperature in this very heated debate.

I have two distinct memories from the Subcommittee hearing that I shared last year that Ms. Lidback was a part of. First of all, we discussed the needs of biotechnology, and it helps us feed a growing population, reduces negative impacts on our environment, and also helps combat plant and pest diseases. But the rhetoric, as Chairman Conaway said, became pretty charged after the hearing. I was disappointed by this rhetoric and misinformation and the personal attacks leveled not only at you but to those who were part of the hearing, including me.

Thanks for coming back. I know you did receive some rude comments and some bullying on social media, and I really appreciate hearing your perspective as a dairy farmer, and as a father of three children myself, I appreciate hearing your perspective as a mother.

Last, on the right-to-know argument, consumers can already find out information when they are at the grocery store. Food that is labeled as USDA certified organic does not contained genetically modified ingredients. I want to read something from *The New York Times* editorial just a couple of years ago. "Consumers can already find products free of GMO ingredients with labels voluntarily placed by the manufacturers. For those who want to avoid such ingredients, the surest way is to buy products certified as organic under Federal standards." Now, this is *The New York Times,* not necessarily a hotbed of conservative rhetoric on their editorial board.

So with that, Mr. Chairman, I yield back.

The CHAIRMAN. The gentleman yields back. Thank you. I now recognize the Ranking Member on the Subcommittee, Ms. DelBene, for her statement.

**OPENING STATEMENT OF HON. SUZAN K. DELBENE, A REPRESENTATIVE IN CONGRESS FROM WASHINGTON**

Ms. DELBENE. Thank you, Mr. Chairman. I appreciate you holding this hearing, and I want to thank all of the witnesses for being here today.

As the Ranking Member on the Subcommittee, this is an issue I hear about very often, not only here, but also in my district back

home in Washington State. In fact, Washington State was among the states which recently voted on a GMO labeling initiative, and one of the biggest takeaways for many of us from that initiative, as well as this debate generally, is that there needs to be more of a dialogue and more education done on all sides.

I certainly agree that consumers have a right to know what they are eating, and I also believe that we need to be clear and take a science-based approach when we are discussing GMOs. Just as many of us implore folks to look at the science behind climate change, for example, we can't pick and choose. We need to understand the science and its findings, including in this case.

Genetically modified doesn't mean just one thing or just one company, and as someone who started their career in biomedical research, I understand that this technology has the potential to provide benefits to consumers. However, we also need to ensure that we are having an open conversation about its impacts and its challenges. This is often an emotional argument, and it is my hope that moving forward we can have it be more of a fact-based open discussion on all sides.

I am looking forward to the testimony of our panel today and am hopeful that we can move closer to a workable solution as a result for everyone. So thank you again, Mr. Chairman, for this hearing, and I yield back.

The CHAIRMAN. I thank the gentlewoman. The chair would request that other Members submit their opening statements for the record so that witnesses may begin their testimony and to ensure there is ample time for questions.

I would now like to welcome to our witness table the following witnesses: We have here Mr. David Schmidt, President and CEO of the International Food Information Council here in D.C. We have Dr. Nina Federoff, the Senior Science Advisor, OFW Law Firm here in D.C. We have Ms. Joanna Lidback, owner of The Farm at Wheeler Mountain, on behalf of Agri-Mark Dairy Cooperative, the National Council of Farmer Cooperatives, and the National Milk Producers Federation from Westmore, Vermont. We have Mr. Lynn Clarkson, President, Clarkson Grain Company at Cerro Gordo—is that close enough—Illinois. Mr. Thomas Dempsey, CEO, Snack Food Association in Arlington, Virginia, and Mr. Chris Policinski. I butchered that, Chris. Sorry about that. President and CEO, Land O' Lakes in Arden Hills, Minnesota.

Mr. Schmidt, begin when you are ready, please.

**STATEMENT OF DAVID B. SCHMIDT, PRESIDENT AND CHIEF EXECUTIVE OFFICER, INTERNATIONAL FOOD INFORMATION COUNCIL AND FOUNDATION, WASHINGTON, D.C.**

Mr. SCHMIDT. Thank you, Chairman Conway, distinguished Members. I am David Schmidt, President and CEO of the International Food Information Council and Foundation. We effectively communicate science-based information on food safety and nutrition issues to health professionals, journalists, educators, government officials and consumers. We are fortunate to receive support for our programs from leading food, beverage, and agricultural companies, but I must clarify that we don't represent those industries.

Last year, IFIC conducted the 2014 Consumer Perceptions of Food Technology Survey. It was our 16th such survey since 1997. The survey polled 1,000 adults who are reflective of the U.S. population, according to the U.S. Census Bureau. Our survey begins with open-ended questions, which are more reliable when it comes to taking the real pulse of consumers than surveys with a small number of carefully worded questions designed to provoke concerns.

When it comes to food labels, the results show that biotechnology, or even the phrase *GMOs,* is not a top-of-mind concern for the vast majority of consumers. Following the open-ended questions, we get more specific about biotechnology and genetic engineering, but please note that we do not use the term *GMO* for two major reasons. Number one, The U.S. FDA has provided labeling guidance to industry, reaffirmed as recently as April 2013, that the scientifically accurate terms are bioengineered, genetically engineered, or foods produced using biotechnology. Their analysis considers the term genetically modified organism, or GMO, as potentially misleading to consumers because it is a distinction without a difference. And as you said, Mr. Chairman, humans have been genetically modifying crops and animals for tens of thousands of years.

Number two, our own consumer research since the early 1990s has found *GMO,* as a phrase, to be off-putting at best or even frightening to many consumers. And unfortunately in today's marketplace, it is used as something to avoid and a pejorative, rather than a way to inform consumers.

When we first asked if people were avoiding any particular foods or ingredients in their diet, only two percent of total respondents mentioned biotech food or even similar terms like *GMOs.* Then we asked them if they could think of any information that currently is not on food labels but should be. Three-quarters of them, 75 percent, said no. Just four percent said that labels should carry information about genetic engineering or related terms. Two-thirds of Americans said they were confident in the safety of the food supply. When we asked people about their specific food safety concerns, *biotech* or any related term was far down the list at seven percent. When we asked the respondents to offer their impressions of food biotechnology before mentioning any benefits, there was an almost-even split between 28 percent who were favorable and 29 percent unfavorable with more than four in ten either neutral or didn't know.

The survey then asked about which sources of information on food biotechnology consumers trust most. Health organizations, cited by 50 percent of consumers ranked first, followed by Federal Government agencies and health professionals at 45 percent each. We then focused on attitudes toward particular benefits of food biotechnology.

Referring back to my point on language above, it is not surprising that consumers may shy away when provoked to be concerned about "genetically modified organisms in your food." But notice the difference in support when we use more informative language to explain some of the benefits of the technology. Seventy-two percent said they were likely to purchase products made with

oils modified by biotechnology to provide more healthful fats. Sixty-nine percent were likely to buy such products if they were modified to reduce the potential for carcinogens, and 69 percent also said they would buy bread, crackers, cookies, cereals, or pasta made with flour modified to use less land, water, and/or pesticides.

Next, we returned to labeling issues and tried to get at consumers' attitudes another way, by asking whether people favored the current FDA policy regarding foods produced using biotechnology. We told them the policy requires special labeling only when biotechnology's use substantially changes the food's nutritional content or when a potential safety issue such as a food allergen is identified. Otherwise, special labeling is not required. Sixty-three percent of respondents supported the current FDA policy, while 19 percent opposed it. In fact, every survey we have conducted since 1997 has found a strong majority of Americans support this FDA labeling policy.

When we looked more generally at the most favored uses of food biotechnology, reducing pesticide applications topped the list, followed by keeping food prices stable and helping feed undernourished people around the world.

Mr. Chairman, in closing, let me emphasize that in our nearly 2 decades of consumer research, we have learned that consumers are supportive of the many benefits of food and agricultural biotechnology when clearly articulated. The food label is not a playground for every bit of information someone might want to know. We rely on the FDA to ensure that the precious real estate available on a food label is reserved for important health, ingredient, and nutrition information, and it is clear that a strong majority of Americans have confidence in the FDA's labeling policy for foods produced using biotechnology. Thank you for this opportunity to share consumers' perspectives.

[The prepared statement of Mr. Schmidt follows:]

PREPARED STATEMENT OF DAVID B. SCHMIDT, PRESIDENT AND CHIEF EXECUTIVE OFFICER, INTERNATIONAL FOOD INFORMATION COUNCIL AND FOUNDATION, WASHINGTON, D.C.

Chairman Conaway, distinguished Members, my name is David Schmidt, and I'm President and CEO of the International Food Information Council, or IFIC.

Our mission is to communicate science-based information on food safety and nutrition issues to health professionals, journalists, educators and government officials. We are fortunate to receive support for our programs from leading food, beverage and agricultural companies, but I must clarify that we don't represent those industries.

Thank you for inviting me to speak today regarding U.S. consumer attitudes toward food biotechnology and related aspects, such as labeling.

Last year, IFIC conducted the 2014 Consumer Perceptions of Food Technology Survey (*http://www.foodinsight.org/2014-foodtechsurvey*). It was our 16th such survey since 1997, and it has offered trended U.S. consumer insights on plant and animal biotechnology and labeling longer than any publicly available data.

**Survey Methodology**

Let me begin with the methodology, which can be found in the slides that are included after my written remarks. The public can access the full text of the survey's questions and answers, along with many other educational resources, at *foodinsight.org/biotech*.

The 2014 IFIC Food Technology Survey polled 1,000 adults who are reflective of the U.S. population, according to the U.S. Census Bureau, and had just a three percent margin of error.

Our survey begins with open-ended questions, which are more reliable when it comes to taking the real pulse of consumers than surveys with a small number of carefully worded questions designed to provoke concerns.

We believe this technique yields a more accurate view of what is most important to Americans. Throughout 18 years of conducting this research, we have not seen consumer perceptions about food biotechnology change dramatically. When it comes to food labels, the results show that biotechnology, or even "GMOs," is not a top-of-mind concern for the vast majority of consumers.

Following the open-ended questions, we get more specific about biotechnology and genetic engineering, but please note that we do not use the term "GMO" for two major reasons:

(1) The U.S. Food and Drug Administration (FDA) has provided labeling guidance to industry, reaffirmed as recently as April 2013, that the scientifically accurate terms are "bioengineered," "genetically engineered," or "foods produced using biotechnology." Their analysis considers the term "genetically modified organism" or "GMO" as potentially misleading to consumers, because it is a distinction without a difference. Humans have been genetically modifying crops and animals for tens of thousands of years, but through far less precise or efficient methods than we enjoy today.

(2) Our own consumer research since the early 1990s has found "GMO" to be off-putting at best or even frightening to many consumers. And unfortunately in today's marketplace, it is used as something to avoid and a pejorative, rather than a way to inform consumers.

And now to the survey itself, and I would note that this is the precise order in which the questions were posed.

**Foods Avoided and Food Label Information**

We first asked if people were avoiding any particular foods or ingredients in their diet. Only *2 percent* of total respondents mentioned biotech food—or even similar terms like the aforementioned "GMOs."

Then we asked them if they could think of any information that currently isn't on food labels but should be. Three-quarters said "no." Out of the total sample, just four percent said that labels should carry information about genetic engineering or related terms. This is a number that has barely budged over the history of our survey.

**Food Safety**

Next was the topic of food safety. Two-thirds of Americans said they were confident in the safety of the food supply. This number has remained consistently high since 2008, which might come as a surprise to some, given the tone and tenor of the rhetoric that surrounds us. Only 13 percent said they're not confident, while 20 percent were neutral.

When we asked people about their specific food safety concerns, "biotech" or any related term was far down the list at seven percent. Remember, these questions are designed to reveal top-of-mind insights, not to guide people to a desired outcome. That number, while small, has indeed risen a few percentage points since 2008, which is undoubtedly a reflection of the heated communications environment.

Conversely, the food safety threats that most concern consumers, both today and in past surveys, revolve around diseases and contamination, along with food handling and preparation—both of which were mentioned by 18 percent of respondents. That was followed by 12 percent who cited preservatives and chemicals, and ten percent who mentioned agriculture production issues.

**General Impressions of Food Biotechnology**

When we asked the respondents to offer their impressions of food biotechnology (before mentioning any benefits), there was an almost even split between 28 percent who were favorable to the technology and 29 percent who were unfavorable. More than four in ten were either neutral or didn't know enough to offer a response.

**Consumer Trust**

As with much of our other consumer research, the 2014 IFIC Food Technology Survey then asked about which sources of information on food biotechnology consumers trust most.

Health organizations, cited by 50 percent of respondents ranked first, followed by Federal Government agencies and health professionals, at 45 percent each.

Farmers rated highly for 39 percent of respondents, while scientists were among the most trusted sources of 33 percent.

At the other end of the spectrum, journalists, bloggers, and celebrities were trusted by consumers only in the single digits.

**Benefits of Food Biotechnology**

At this point, we focused on attitudes toward particular benefits of food biotechnology. When consumers became aware that some products on the market or in the pipeline offered nutrition and health-related benefits, they were overwhelmingly positive.

Referring back to my point on language above, it is not surprising that consumers may shy away when provoked to be concerned about "genetically modified organisms in your food." But notice the difference in support when we use more informative language to explain some of the benefits of the technology:

- 72 percent said they were likely to purchase products made with oils modified by biotechnology to provide more healthful fats.
- 69 percent were likely to buy such products if they were modified to reduce the potential for carcinogens—the same number who would buy products if they were modified to be protected from insect damage and to require fewer pesticide applications.
- 69 percent also said they would buy bread, crackers, cookies, cereals, or pasta made with flour modified to use less land, water, and/or pesticides.

The list goes on, with positive perceptions of foods modified to provide enhanced nutritional benefits, eliminate trans fat content, improve vitamin content, or taste better or fresher.

**Current FDA Labeling Policy**

Next, we returned to labeling issues and tried to get at consumers' attitudes another way, by asking whether people favored the current FDA policy regarding foods produced using biotechnology. We told them the policy requires special labeling "only when biotechnology's use substantially changes the food's nutritional content, or when a potential safety issue such as a food allergen is identified. Otherwise, special labeling is not required."

Sixty-three percent of respondents supported the current FDA policy, while 19 percent opposed it. The number of those who are opposed to the policy has risen a few points in recent years, while support has remained mostly steady. In fact, every survey we have conducted since 1997 has found a strong majority of Americans support this FDA labeling policy.

**Consumers' Favored Uses**

When we looked more generally at the most favored uses of food biotechnology, reducing pesticide applications topped the list, followed by keeping food prices stable, and helping feed undernourished people around the world.

Close behind those favored uses were food crops that can survive in extreme climates, and the reduced use of nonrenewable resources in food production.

**Conclusion**

Mr. Chairman, in closing, let me emphasize that in our nearly 2 decades of consumer research, we've learned that consumers are supportive of the many benefits of food and agricultural biotechnology when clearly articulated.

The food label is not a playground for every bit of information someone might want to know. We rely on the FDA to ensure that the precious real estate available on a food label is reserved for important health, ingredient, and nutrition information, and it is clear that a strong majority of Americans have confidence in the FDA's labeling policy for foods produced using biotechnology.

The International Food Information Council would be pleased to offer you or your staff any additional resources in support of my testimony, as well as the work we do on food biotechnology and other issues. Thank you once again for this opportunity.

SLIDES


2014 Consumer Perceptions of Food Technology Survey
David B. Schmidt
President & CEO
International Food Information Council
Testimony to US House Agriculture Committee on
Cost and Impacts of Mandatory Biotechnology Labelling Laws
10 a.m., March 24, 2015
IFIC
International
Food
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Council


International Food Information Council (IFIC)
IFIC
International
Food
Information
Council
Mission: To effectively communicate science-based information about food safety and nutrition to health and nutrition professionals, government officials, educators, journalists, and consumers.
Primarily supported by the broad-based food, beverage, and agricultural industries.

## Methodology

- Sampled from the population of U.S. adults (18+)
- All studies weighted to be nationally representative
- Conducted via web
- Statistical significance determined at the 95% confidence level
- Margin of error is +/- 3% for total sample and +/- 7% for Moms/Millennials oversample.

| Study Composition | 2014 | 2012 | 2010 | 2008 |
|---|---|---|---|---|
| Population: | U.S. adults (18+) | | | |
| Sample: | n=1000 | n=750 | n=750 | n=1000 |
| Date: | Mar 28-April 7 | Mar. 7-19 | Apr. 5-26 | July 29 – Aug. 18 |
| Weighted on: | • Gender<br>• Age<br>• Race<br>• Education<br>• Marital status<br>• Region<br>• Income (only for 2014 and 2012) | | | |

Research firm: Market Strategies International (Livonia, Michigan)

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## Foods Avoided/Reasons Avoiding Certain Foods

- Just over 50 percent of Americans report avoiding certain foods/ingredients, consistent from previous years. Sugars and Carbs continue to lead the list of foods consumers say they're limiting/avoiding.

| | Total 2014 |
|---|---|
| | n=1000 |
| Avoiding certain foods (% Yes) | 53% |
| Types of foods avoiding | n=543 |
| Sugar/carbs | 55% |
| Fats/oils/cholesterol | 26% |
| Animal products | 25% |
| Snack foods/fast foods/soda | 20% |
| Salt/sodium | 18% |
| Artificial/additives | 6% |
| Processed/refined foods | 2% |
| Biotech | 2% |

| Reason Avoiding | |
|---|---|
| Managing weight | 60% |
| Concerned about impact on health | 51% |
| Health condition requires avoiding/limiting | 31% |
| Doctor recommended I avoid | 19% |
| Read/Saw something in the news that concerned me | 17% |
| Managing food costs | 12% |
| Food allergy | 9% |
| Don't like the taste/texture | 7% |
| Some other reason | 1% |
| Avoiding while pregnant | <1% |

Q7. Thinking about your diet over the past few months, are there any foods or ingredients that you have avoided or eaten less of?
Q8_2. [IF AVOIDED FOODS] Why have you avoided these foods/ingredients?
Q8_2. Why have you avoided these foods/ingredients?

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## Interest in Adding Information to Current Food Labels

- Only one-quarter of consumers would like additional information on the label.
- Of those, nutrition and ingredient information, as well as biotech and source/processing information, are mentioned.

| | Total 2014 (A) | Total 2012 (B) | Total 2010 (C) | Total 2008 (D) |
|---|---|---|---|---|
| | n=1000 | n=751 | n=750 | n=1000 |
| % Want more info on food labels | 26% CD | 24% CD | 18% D | 14% |
| Types of information desired | n=1000 | n=751 | n=750 | n=1000 |
| Nutritional information | 8% | 8% | 7% | 6% |
| Ingredients | 5% CD | 4% | 4% | 3% |
| Biotech | 4% BCD | 1% | 1% | 0% |
| Source/processing info | 4% CD | 3% | 2% | 2% |
| Food safety info | 2% CD | 4% ACD | 0% | 1% |
| Other | 1% B | <1% | <1% | <1% |

A/B/C/D indicate statistical significance between years
Q9. Can you think of any information that is not currently included on food labels that you would like to see on food labels?
Q10. [IF YES] What types of information would that be? [OPEN END]

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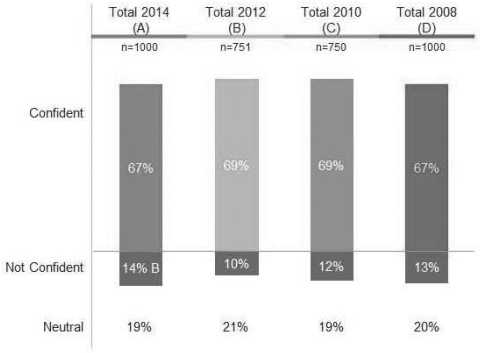
## Confidence in the Food Supply

- Confidence in the U.S. food supply remains consistently high since 2008.




A/B/C/D indicate statistical significance between years
Q11. How confident are you about the safety of the US food supply? Would you say…?

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## Food Safety Concerns

- Disease/contamination and handling/prep are still the most mentioned food safety concerns, although to a lesser degree than previous years.

| Food safety concerns | Total 2014 (A) n=1000 | Total 2012 (B) n=751 | Total 2010 (C) n=750 | Total 2008 (D) n=1000 |
|---|---|---|---|---|
| Disease/contamination | 18% | 29% A | 29% A | 38% ABC |
| Handling/preparation | 18% | 21% | 23% AD | 17% |
| Preservatives/Chemicals | 12% D | 13% CD | 8% D | 6% |
| Agricultural production | 10% CD | 7% | 7% | 5% |
| Packaging/labeling | 9% BCD | 5% D | 4% | 2% |
| Health/nutrition | 7% D | 8% D | 6% | 4% |
| Biotech | 7% BCD | 2% | 2% | 1% |
| Food sources | 6% | 7% | 8% | 9% A |
| Processed foods | 3% BCD | 1% | 1% | 1% |
| Other | 3% CD | 1% | 1% | <1% |

A/B/C/D indicate statistical significance between years
Q12. What, if anything, are you concerned about when it comes to food safety? [OPEN END]

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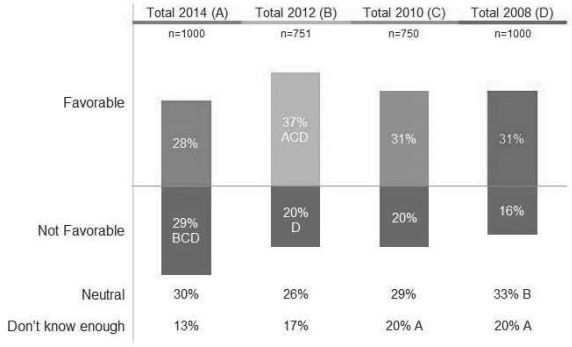
## Impressions of Food Biotechnology

- Just over one-quarter (28%) of consumers are favorable toward using biotechnology, with the same number being unfavorable, a significant change from 2012.




A/B/C/D indicate statistical significance between years
Q14. What is your overall impression of using biotechnology with plants that produce food products? Would you say you are…?

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## Health professionals are top trusted sources for information about food biotechnology

| Preferred source (total ranked 1st-3rd) | Total 2014 n=1000 |
|---|---|
| | Food Biotechnology |
| Health organization | 50% |
| Government agency | 45% |
| Health professional | 45% |
| Farmer | 35% |
| Scientist | 30% |
| Friends/family | 22% |
| Nonprofit organization | 20% |
| Grocery store, drug store, or specialty store | 10% |
| Product manufacturer | 10% |
| Veterinarian | 10% |
| Journalist | 9% |
| Blogger | 7% |
| Celebrity | 5% |

Q19. Which of the following sources, if any, do you or would you trust for information on biotechnology? *Rank your top three.*

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## Likelihood to Purchase Plant Biotech Foods

- Consumers show high interest in nutrition & health-related benefits of food biotechnology.
- Nearly three-quarters of Americans say they are likely to purchase foods made with oils modified to provide more healthful fats, such as Omega-3s.

| Total 2014 (n=1000) | Not Likely | Likely |
|---|---|---|
| Food product made with oils modified by biotechnology to provide more healthful fats, like Omega-3, in the food | 28% | 72% |
| Variety of produce modified by biotechnology to reduce the potential for carcinogens (n=501) | 31% | 69% |
| Variety of produce modified by biotechnology to be protected from insect damage and required fewer pesticide applications | 31% | 69% |
| Bread, crackers, cookies, cereals, or pasta made with flour modified to use less land, water, and/or pesticides | 31% | 69% |
| Bread, crackers, cookies, cereals, or pasta made with flour modified to enhance nutritional benefits | 33% | 67% |
| Food product made with oils modified by biotechnology to eliminate the trans fat content in the food* | 33% | 67% |
| Variety of produce modified by biotechnology to improve vitamin content (n=499) | 35% | 65% |
| Variety of produce modified by biotechnology to taste better or fresher | 42% | 58% |

*Note: Wording change from 2012 - "reduce the saturated fat content"
A/B indicate statistical significance between years
PB5. Q25 Q22 Q23. All other things being equal, how likely would you be to buy…

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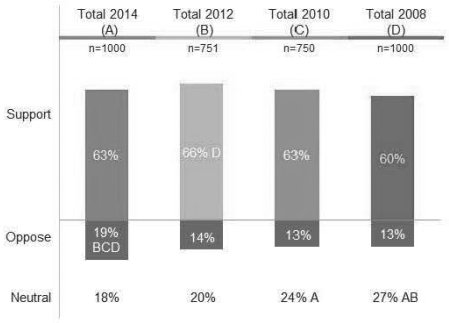
## FDA Food Labeling

- The majority of Americans support the current FDA policy for labeling of foods produced through biotechnology, although the percentage who oppose is higher than in 2012.




A/B/C/D indicate statistical significance between years

Q28. The U.S. Food and Drug Administration (FDA) requires special labeling when a food is produced under certain conditions. When biotechnology's use substantially changes the food's nutritional content, like vitamins or fat, or its composition, or when a potential safety issue, such as a food allergen, is identified. Otherwise, special labeling is not required. Would you say that you support, or oppose this FDA policy?

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## Most Favored Uses of Biotechnology

- Reducing pesticide applications, keeping food prices stable, and helping feed undernourished globally are the top three favored uses of biotechnology.

| Most favored uses of biotech | Total 2014 n=1000 Total Ranked 1st-3rd | Ranked 1st | Ranked 2nd | Ranked 3rd |
|---|---|---|---|---|
| Reducing the amount of pesticide applications. | 48% | 18% | 18% | 12% |
| Keeping food prices stable. | 41% | 16% | 11% | 13% |
| Helping feed undernourished people around the world. | 38% | 16% | 10% | 11% |
| Developing food crops that can survive in extreme climates [e.g. drought, flood, etc.] | 37% | 11% | 14% | 13% |
| Preserving food availability by protecting crops from disease. | 35% | 12% | 13% | 10% |
| Reducing our use of nonrenewable resources in food production. | 26% | 5% | 10% | 12% |
| Protecting wildlife habitats by using existing land to grow. | 26% | 9% | 10% | 8% |
| Reducing greenhouse gas emissions. | 18% | 5% | 5% | 8% |
| Requiring fewer animals for food production. | 15% | 4% | 4% | 7% |
| Reducing the carbon footprint of food. | 10% | 2% | 4% | 4% |

V3. Which of the following would you be most in favor of using food biotechnology to assist in? *Rank your top three.*

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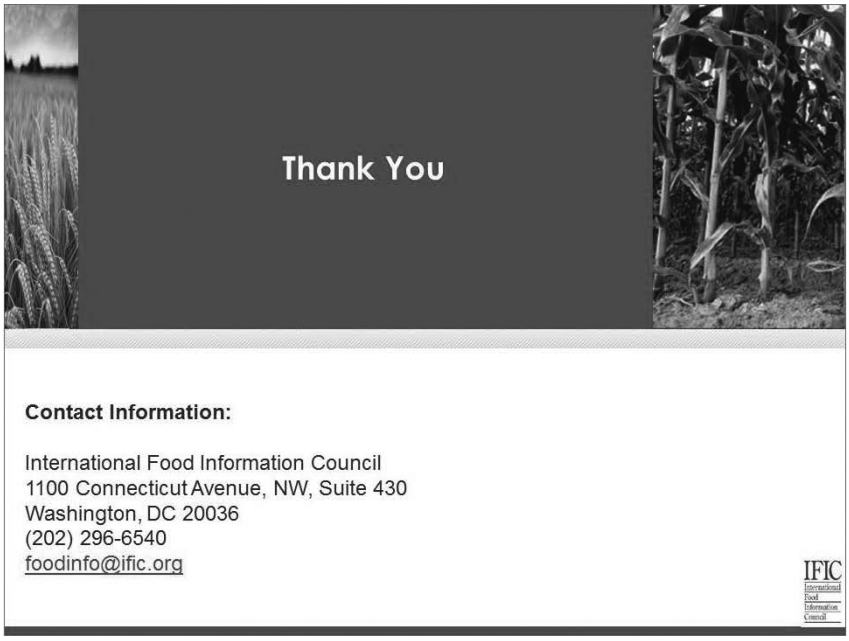



The CHAIRMAN. Thank you, Mr. Schmidt. Dr. Federoff?

**STATEMENT OF NINA V. FEDOROFF, PH.D., SENIOR SCIENCE ADVISOR, OLSSON FRANK WEEDA TERMAN MATZ PC (OFW LAW), WASHINGTON, D.C.**

Dr. FEDOROFF. Chairman Conway, Representative Peterson, Members of the Committee, thank you for the opportunity to testify before you today. I am Nina Federoff. I am a Professor of Plant Molecular Biology and Genetics. I have had 35 years of experience with GM techniques. I am a member of the U.S. National Academy of Sciences and a National Medal of Science Laureate. I served as Science and Technology Adviser to Secretaries of State Condoleeza Rice and Hillary Clinton. I authored a book titled *Mendel in the Kitchen: A Scientist's View of Genetically Modified Foods.*

I am here to tell you why mandatory labeling of foods containing GM ingredients will not help Americans make healthful food choices. More than that, I will tell you why such labels could well undermine humanity's efforts to achieve food security.

Now a recent poll, Pew poll, of scientists and the public gave startling results: Only 37 percent of the public believes GMOs are safe as compared with almost 90 percent of scientists.

So why are scientists convinced? GM crops have been in commercial production for almost 20 years. They have an impeccable safety record and multiple environmental benefits. They have boosted farmers' incomes and reduced consumer prices. These are the facts, and they have been documented in independent studies referenced in my written testimony.

Scientific academies around the world concur that modern methods of genetic modification are as safe as those used by previous generations of plant and animal breeders.

Now, until the development of modern GM techniques, breeders had to depend on either rare natural or more recently induced mutations—that is just another term for genetic modifications—to develop better crops. Today we know enough about genes to introduce a desired trait into an already highly productive plant or animal without the undesirable downsides of older methods.

Now it is worth pointing out as the Chairman did that the history of plant and animal genetic modification extends back more than 10,000 years. We created corn, not Mother Nature. We created big, luscious heirloom tomatoes. Mother Nature's are tiny and can be deadly.

Now the FDA just approved Simplot's GM potato that won't turn brown after you cut it, and more importantly, it contains less of a natural amino acid that turns into the toxic compound acrylamide when the potatoes are French fried in hot oil. These potatoes will be more healthful and less wasteful. But today, more than 60 percent of Americans believe that GMOs are unsafe and probably wouldn't choose to buy them.

Now why is that? The reasons lie in the increasingly strident efforts of determined anti-GMO activists to convince the public that GMOs are bad. Some of these folks are—most prominent among these are the NGOs, such as Greenpeace, and marketers of organic foods. A recent, meticulously researched organic marketing report documents how organic marketers have progressively demonized GMOs while advancing organically grown foods as more healthful than conventionally grown food.

Now some of these folks and many other kinds of anti-GMO activists have openly stated that labeling will help them drive GMOs out of the market. Now, the facts are these: Organic produce is no more nutritious than conventionally grown produce. It is more expensive because organic farming is land-inefficient and labor-intensive. The organic industry's false and misleading marketing is a primary reason why consumers believe GMOs are bad and organic food is good. Attaching a GM label provides no consumer benefit since GM foods are as safe and nutritious as their non-GM counterparts. But attaching a label will send the false message that there is something to worry about because the FDA's labels are there to alert consumers to food ingredients with health implications.

Now my final point is that there are serious humanitarian implications should the current GMO vilification efforts succeed in driving GM technology out of agriculture. Global agricultural productivity increases are even now lagging behind population growth, and that is without figuring in the increasingly negative impacts of climate warming.

Now the future lies in agricultural intensification. We will need to produce more crop per drop of water and square meter of land. Genetic modification of plants, in which the United States currently leads, will be the key to feeding the nine or ten billion people we expect for dinner in just a few decades. We cannot afford to discard the best methods we have ever invented to continue growing the food supply and doing it more sustainably.

Thank you very much.
[The prepared statement of Dr. Federoff follows:]

PREPARED STATEMENT OF NINA V. FEDOROFF, PH.D., SENIOR SCIENCE ADVISOR, OLSSON FRANK WEEDA TERMAN MATZ PC (OFW LAW), WASHINGTON, D.C.

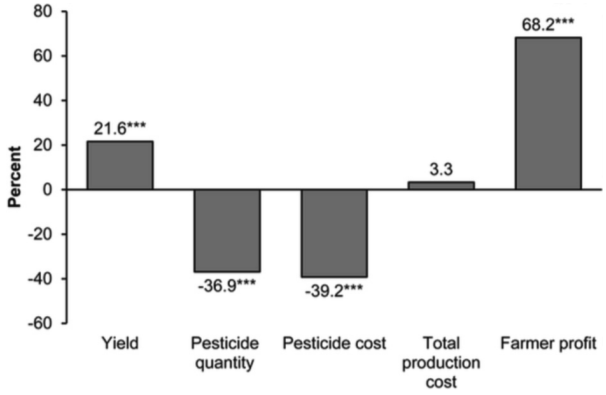
Chairman Conway, Representative Peterson, Members of the Committee, thank you very much for the opportunity to testify before you today. My name in Nina Fedoroff and I am a professor of plant molecular biology and genetics. My laboratory pioneered in the adaptation of genetic modification of GM techniques to plants more than 35 years ago. I am a member of the U.S. National Academy of Sciences and a National Medal of Science laureate. I served as the Science and Technology Adviser to Secretaries of State Condoleeza Rice and Hillary Clinton. I co-authored a book titled *Mendel in the Kitchen: A Scientist's View of Genetically Modified Foods.*[1]

I am here to tell you why mandatory labeling of foods containing GM ingredients is counterproductive to Americans' ability to make healthful food choices. More than that, I will tell you why such labels could well undermine humanity's efforts to achieve food security.

A recent poll of scientists and the public on GMOs gave startling results: only 37% of the public believes GMOs are safe, compared with almost 90% of scientists.[2]

So what's the evidence? GM crops have been in commercial production for almost 20 years.[3] They have an impeccable safety record and multiple environmental benefits.[4] Despite anecdotal reports, often never published or subsequently retracted, no allergies, illnesses or deaths have been reproducibly linked to the consumption of GM food or feed.[5, 6, 7]

GM crops have boosted yields and farmers' incomes.[4, 8] The figure [*below*] illustrates these impacts graphically (from the cited Klümper and Qaim reference). Environmental impacts for the period 1996–2012 include the application of 503,000 tons **less** pesticide (active ingredient), greenhouse gas reductions of 16 million tons $CO_2$ and increased soil carbon sequestration from no till farming estimated at more than 200 million tons $CO_2$.[4]



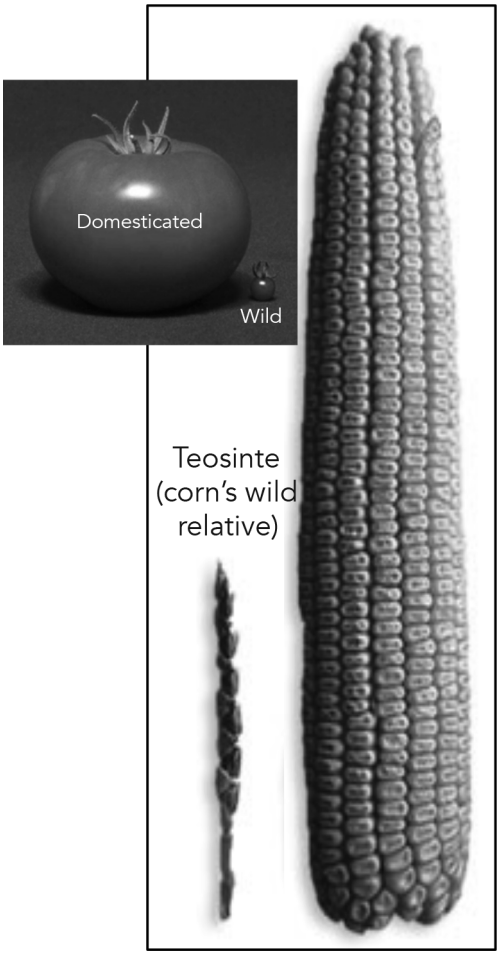

Consumers have benefited not only through continuing low food prices, but also directly from decreased mycotoxin contamination of corn.[9] GM Bt corn contains a bacterial gene that encodes a protein that is toxic to certain boring insect pests, but not to animals or people. Such insects bore holes in developing corn plants, allowing fungi to enter and grow, as illustrated [*below*]. The fungi, in turn, produce mycotoxins, which are compounds that are toxic and can be carcinogens for people and farm animals. Bt corn is protected from insect attack, so no insect holes, no fungi, no mycotoxins.


Scientific academies and scientific societies around the world concur that modern methods of genetic modification are as safe as those used by previous generations of plant and animal breeders, arguably safer.[6] *Appendix I* shows quotations from the GM statements of scientific organizations. Decades of research on GMO biosafety have simply failed to identify hazards unique to the use of GM technology for crop improvement. Quoting from a recent EU report on GMO research:[10]

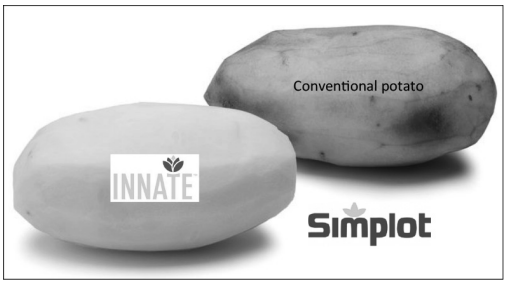
> "The main conclusion to be drawn from the efforts of more than 130 research projects, covering a period of more than 25 years of research, and involving more than 500 independent research groups, is that biotechnology, and in particular GMOs, are not *per se* more risky than *e.g.,* conventional plant breeding technologies."

Until the development of modern GM techniques, breeders had to depend on either rare natural—or more recently—induced mutations (another name for genetic modifications)—to develop better crops. Today we know enough about genes to introduce a desired trait into an already highly productive plant or animal without the undesirable downsides of older methods.[11]

It's worth pointing out that the history of plant and animal genetic modification extends back some 10,000 years. We created corn, not Mother Nature;[12] we created big, luscious heirloom tomatoes—Mother Nature's are tiny and can be deadly.[13]




The FDA just approved Simplot's Innate potato that won't turn brown after it's peeled and—more importantly—contains less asparagine, a natural amino acid that turns into the toxic compound acrylamide when the potatoes are French fried in hot oil. These genetically modified potatoes will be more healthful and less wasteful. But today, more than 60% of Americans believe that GMOs are unsafe—and probably wouldn't choose to buy them.




Why? The reasons lie in the increasingly strident efforts of determined anti-GMO activists to convince the public that GMOs are bad. Most prominent among these

are NGOs, such as Greenpeace, and the organic food industry. A recent, meticulously researched "Organic Marketing Report" documents how the organic food industry has progressively demonized GMOs, while advancing organically grown food as more healthful than conventionally grown food.[14]

The facts are these. Organic produce is no more nutritious than conventionally grown produce.[15] Quoting the conclusion of the cited 2009 analysis of more than 50,000 publications spanning a 50 year period:

> "On the basis of a systematic review of studies of satisfactory quality, there is no evidence of a difference in nutrient quality between organically and conventionally produced food-stuffs. The small differences in nutrient content detected are biologically plausible and mostly relate to differences in production methods."

Organic produce is more expensive because organic farming is land-inefficient and labor-intensive. Organic marketers—and many other kinds of anti-GMO activists—have openly stated that GMO labeling will help them drive GMOs out of the market. *Appendix II* shows representative quotations from both anti-GMO activists and organic food proponents. The anti-GMO activities of vocal NGOs, particularly Greenpeace, and the organic industry's false and misleading marketing are the primary reasons that consumers believe GMOs are bad and organic food is good.

It is often claimed that consumers have a "right to know" what they are eating. However, adding a "GM" label to food containing an ingredient from a GMO will not help the consumer make meaningful distinctions about either the food's safety or its health benefits. The GM foods on the market today are as safe as and nutritionally equivalent to their non-GM counterparts. So the fact that they are GM is irrelevant information to the consumer. Research on consumer-decision making reveals paradoxically that more information, particularly irrelevant information, actually decreases the accuracy of a consumer's choice, even though it increases the consumer's confidence in the choice.[16, 17]

Labeling would drive up the cost of food[18] while sending the false message that there's something to worry about, because current FDA policy requires that labels contain information on food ingredients that have health (or environmental) implications (*http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Biotechnology/ucm096095.htm*).

My final point is that there are serious humanitarian implications should the GMO vilification efforts succeed in driving GM technology out of agriculture. Global agricultural productivity increases are even now lagging behind population growth[19]—and that's without figuring in the growing impact of climate warming.[20]

The future lies in "agricultural intensification".[21] We will need to produce more crop per drop of water and square meter of land. The next big breakthrough will be in the efficiency of photosynthesis, the almost magical process by which crops turn thin air and water into food powered by sunlight.[22] Genetic modification of plants, in which the U.S. currently leads, will be the key to feeding the nine or ten billion people we expect for dinner in coming decades. Neither Americans nor the rest of the world can afford to lose the best methods we've ever invented to keep growing the food supply sustainably.

**Endnotes**

[1] Nina V. Fedoroff and Nancy Marie Brown, *Mendel in the Kitchen: A Scientist's View of Genetically Modified Food.* (Joseph Henry Press, 2004).

[2] Pew Research Center, *Public and scientists' views on science and society,* (*http://www.pewinternet.org/2015/01/29/public-and-scientists-views-on-science-and-society/*), 2015.

[3] C. James, *Global status of commercialized biotech/GM crops: 2014,* (*http://www.isaaa.org/resources/publications/briefs/49/executivesummary/default.asp*), 2015.

[4] G. Brookes and P. Barfoot, *GM crops: global socio-economic and environmental impacts 1996–2012,* (*www.pgeconomics.co.uk/pdf/2014globalimpactstudyfinal report.pdf*), 2014.

[5] H.A. Kuiper, G.A. Kleter, H.P.J.M. Noteborn, and W.J. Kok, *Assessment of the food safety issues related to genetically modified foods,* THE PLANT J. 27 (6), 503–28 (2001).

[6] A.E. Richroch, *Assessment of GE food safety using '-omics' techniques and long-term animal feeding studies,* NEW BIOTECHNOL. 30, 351–54 (2013).

[7] A.L. Van Eenennaam and A.E. Young, *Prevalence and impacts of genetically engineered feedstuffs on livestock populations,* J. ANIMAL. SCI. 92 (10), 4255–78 (2014).

[8] Wilhelm Klümper and Matin Qaim, *A meta-analysis of the impacts of genetically modified crops,* PLOS ONE 9 (11), e111629 (2014).

[9] Erin Bowers, Richard Hellmich, and Gary Munkvold, *Vip3Aa and Cry1Ab proteins in maize reduce Fusarium ear rot and fumonisins by deterring kernel injury from multiple* ***Lepidopteran*** *pests,* WORLD MYCOTOXIN JOURNAL 6 (2), 127–35 (2013).

[10] European Commission, *A decade of EU-funded GMO research,* 2010.

[11] Peggy G. Lemaux, *Genetically engineered plants and foods: a scientist's analysis of the issues (Part I),* ANNU. REV. PLANT BIOL. 59 (1), 771 (2008).

[12] Nina V. Fedoroff, *Prehistoric GM corn,* SCIENCE 302 (5648), 1158–9 (2003).

[13] Véronique Bergougnoux, *The history of tomato: From domestication to biopharming,* BIOTECHNOLOGY ADVANCES 32 (1), 170–89 (2014).

[14] Joanna Schroeder, Organic Marketing Report, (*http://academicsreview.org/wpcontent/uploads/2014/04/Academics-Review_Organic-Marketing-Report1.pdf*), 2014.

[15] Alan D. Dangour, Sakhi K. Dodhia, Arabella Hayter, Elizabeth Allen, Karen Lock, and Ricardo Uauy, *Nutritional quality of organic foods: a systematic review,* AMERICAN J. CLINICAL NUTRITION 90 (3), 680–5 (2009).

[16] Anthony Bastardi and Eldar Shafir, *On the pursuit and misuse of useless information,* JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY 75 (1), 19 (1998).

[17] Crystal C. Hall, Lynn Ariss, and Alexander Todorov, *The illusion of knowledge: When more information reduces accuracy and increases confidence,* ORGANIZATIONAL BEHAVIOR AND HUMAN DECISION PROCESSES 103 (2), 277–90 (2007).

[18] A. Van Eenennaam, B.M. Chassy, N. Kalaitzandonakes, and T.P. Reddick, *The potential impacts of mandatory labeling for genetically engineered food in the United States,* CAST report (*http://www.castscience.org/file.cfm/media/products/digitalproducts/CAST_Issue_Paper_54_web_optimized_29B2AB16AD687.pdf*), 2014.

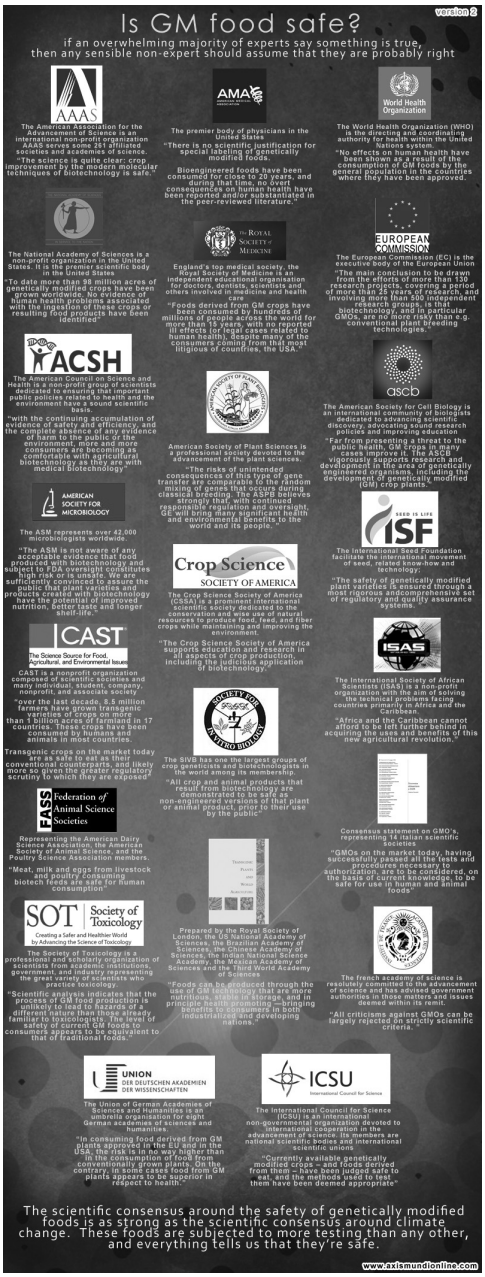
[19] Deepak K. Ray, Nathaniel D. Mueller, Paul C. West, and Jonathan A. Foley, *Yield trends are insufficient to double global crop production by 2050,* PLOS ONE 8 (6), e66428 (2013).

[20] A.J. Challinor, J. Watson, D.B. Lobell, S.M. Howden, D.R. Smith, and N. Chhetri, *A metaanalysis of crop yield under climate change and adaptation,* NATURE CLIMATE CHANGE 4 (4), 287–91 (2014).

[21] David Tilman, Christian Balzer, Jason Hill, and Belinda L. Befort, *Global food demand and the sustainable intensification of agriculture,* PROC. NATL. ACAD. SCI. USA 108 (50), 20260–4 (2011).

[22] Veronica G. Maurino and Andreas P.M. Weber, *Engineering photosynthesis in plants and synthetic microorganisms,* JOURNAL OF EXPERIMENTAL BOTANY 64 (3), 743–51 (2013).

APPENDIX I: SAFETY OF GM TECHNIQUES AND GM FOODS




"The scientific consensus around the safety of genetically modified foods is as strong as the scientific consensus around climate change. These foods are subjected to more testing than any other and everything tells us that they're safe."

*http://www.axismundionline.com/blog/the-new-is-gm-food-safe-meme/*.

APPENDIX II: ANTI-GMO ACTIVISTS AND PROPONENTS OF ORGANIC FOOD ON LABELING

# IS LABELING REALLY ABOUT OUR "RIGHT TO KNOW"?

"We are going to force them to label this food. If we have it labeled, then we can organize people not to buy it."

*—Andrew Kimbrell, Executive Director, Center for Food Safety*

"Personally, I believe GM foods must be banned entirely, but labeling is the most efficient way to achieve this. Since 85% of the public will refuse to buy foods they know to be genetically modified, this will effectively eliminate them from the market just the way it was done in Europe."

*—Dr. Joseph Mercola, Mercola.com*

"By avoiding GMOs, you contribute to the tipping point of consumer rejection, forcing them out of our food supply."

*—Jeffrey Smith, Founder, Institute for Responsible Technology*

"With labeling it (GMOs) will become 0%... For you the label issues is vital, if you get labeling then GMOs are dead-end."

*—Vandana Shiva, environmental activist*

"The burning question for us all then becomes how—and how quickly—can we move healthy, organic products from a 4.2% market niche, to the dominant force in American food and farming? The first step is to change our labeling laws."

*—Ronnie Cummins, Director, Organic Consumers Association*

GENETIC LITERACY PROJECT

www.geneticliteracyproject.org

**SOURCES:**

http://www.responsibletechnology.org/10-Reasons-to-Avoid-GMOs
http://www.youtube.com/watch?v=-HkFf3i9YWtmg
https://www.commondreams.org/view/2012/08/02-0
http://www.activistcash.com/person/1562-andrew-kimbrell/
http://vtdigger.org/2012/04/17/wanzek-genetically-modified-food-is-perfectly-healthy
http://articles.mercola.com/sites/articles/archive/2012/02/29/new-vermont-gmo-labeling-policy-officially-introduced.aspx

The CHAIRMAN. Thank you, Dr. Federoff. Ms. Lidback, thanks again for coming, and let me reiterate my earlier comments. It is reprehensible. We can have differences of opinion, but to attack people——

VOICE. Yes, our own facts.

The CHAIRMAN. Yes, ma'am. And even whether or not based on facts, you can still—but to resort to name-calling and threatening and other less genteel kinds of ways is reprehensible. So thank you for saddling up for a second round. You are recognized for 5 minutes.

**STATEMENT OF JOANNA S. LIDBACK, OWNER, THE FARM AT WHEELER MOUNTAIN, WESTMORE, VT; ON BEHALF OF AGRI-MARK; NATIONAL COUNCIL OF FARMER COOPERATIVES; NATIONAL MILK PRODUCERS FEDERATION**

Ms. LIDBACK. Thank you. Chairman Conaway, Ranking Member Peterson, and other Members of the Committee. Thank you for inviting me here today. I am here on behalf of Agri-Mark Dairy Cooperative, the National Council of Farmer Co-ops, and the National Milk Producers Federation.

My husband and I have a small 50 cow dairy located in northeast Vermont. We also make extra hay to sell. We raise Jersey steers to process and sell beef locally, and we market a small amount of composted manure. We have two young boys, ages 3 and 2.

My husband and I are both proud to be first-generation dairy farmers. We believe in the science and capability of biotechnology and its role in protecting the sustainability of our farm. Biotech crops are essential to treating our cows and calves. We feed both GMO corn and soy products year round along with pasturing, a grass-based silage, and hay.

I believe that biotech varieties improve efficiency and productivity of farming. In my written testimony, I mentioned that I could not find a non-GMO option available to me, but I have since found it. The non-GMO feed would cost $589 per ton. The same conventional feed we currently feed is $333 per ton. On our small farm, we purchase about 16 tons of grain per month, and if you do the math, that is a difference of about $4,100 a month or $49,000 a year. If there are any dairy economists here, this is the equivalent of $1,000 per cow on our farm. I don't see how we could profitably farm with those increased feed costs.

As a small farm just starting out, we are constantly exploring new opportunities to grow our business. One of the things we have been looking at recently is growing our own corn and alfalfa. In our short growing season, genetically engineered seeds offer the best options for us. Incidentally, over 97 percent of the corn grown for silage in Vermont is biotech crop.

I personally believe that there is room for many different styles of farming. I also believe that biotechnology will play a major role in our ability to feed a growing world and to make improvements on our own individual farms. Certainly, as a dairy farmer, increasing feed costs would have a devastating impact on my business. But beyond our farm gate, we know that the impact would be just as brutal. In my area of rural northeast Vermont, 80 percent of the children in elementary school receive free reduced-price school

lunches. It is their families who would suffer the most from price increased caused by mandatory biotech labeling.

As a mother and a consumer, I do not to purchase organic or non-GMO food in the store since I would be paying more with no added nutritional, health, or environmental benefits. I firmly believe the food I feed my two growing boys is safe.

You must be aware that recently my State of Vermont passed a mandatory GMO labeling law. In New England, it is very easy to cross borders for various reasons, such as grocery shopping. If the Vermont labeling law is activated, there will likely be one label on food in Vermont and another on the exact same food in New Hampshire, raising questions about whether or not the product is actually the same.

Furthermore, the Vermont law exempts meat and dairy from being labeled. Other states may not exempt those products as they consider their own GMO labeling bills. Doing so will affect my ability to market my USDA certified Jersey beef across state lines. This serves no one's interests, not consumers, not farmers, not food producers.

I am happy to speak up for our right to farm in whatever way we choose, which in our case, includes biotechnology and the use of GMOs. It is important to continue the conversation about the opportunities and challenges we face as modern-day farmers and parents. When I have one person or ten people reach out to me for a question or appreciating my practical perspective from the farm, then I have succeeded.

Sometimes this isn't an easy task. As the Chairman mentioned, I testified at a Subcommittee hearing on this very topic last summer and received some very rude comments from total strangers on social media and phone calls from them in the middle of the night.

It was not always the most pleasant experience, but being a dairy farmer, I am used to having to do unpleasant jobs from time to time. Even with those negative encounters, or maybe because of them, I was eager to come back and share my experiences today. I am proud of how far the American farmer has come, just as I am proud of how far we have come on our own farm. If my sons choose to continue in farming, I want to know that my husband and I have provided them with a firm foundation to build on.

Thanks again for the opportunity to be here with you today.

[The prepared statement of Ms. Lidback follows:]

PREPARED STATEMENT OF JOANNA S. LIDBACK, OWNER, THE FARM AT WHEELER MOUNTAIN, WESTMORE, VT; ON BEHALF OF AGRI-MARK; NATIONAL COUNCIL OF FARMER COOPERATIVES; NATIONAL MILK PRODUCERS FEDERATION

Chairman Conaway, Ranking Member Peterson, and other Members of the Committee, thank you for inviting me here today to talk about the costs and impacts of mandatory biotech labeling laws. Today I am here on behalf of Agri-Mark Dairy Cooperative, the National Council of Farmer Cooperatives and the National Milk Producers Federation.

My husband and I have a small 50 cow dairy located in northeast Vermont. We also grow extra hay to sell, raise Jersey steers to process and sell beef locally, and market a small amount of composted manure. We rent the farm started by my husband's grandfather, from his aunt and uncle, and it consists of over 200 acres of tillable land, including roughly 50 acres of pasture where we graze our herd in temperate months. We also raise all of our own young stock or replacement heifers. We have two young boys, ages 3 and 2.

Along with being an active partner on the farm, I have a full-time job with a Farm Credit Association as a business consultant, serve as First Vice President of our county Farm Bureau and as a dairy cattle judge for various youth and 4–H dairy shows across New England. I did not grow up on a farm but got involved in agriculture through a 4–H dairy project as a young girl in 1989. Since then, I have not let go of my Jersey cows. I boarded my animals on neighboring farms and as fate would have it met a dairy farmer who I would eventually settle down with, bringing my Jerseys along. I have a bachelor's degree from Cornell University where I focused on agribusiness management and a master's in business administration from the F.W. Olin School of Business at Babson College.

My husband and I are both proud to be first-generation dairy farmers. Starting out on our own in building our farm has required a lot of hard work and at times has been tremendously challenging. Being able to raise our young sons in a farming lifestyle, and living out our dreams of caring for his family's land and our animals while producing food for our neighbors and community, though, has been hugely rewarding.

As we have started out, our overall focus is building a farm that is sustainable—one that is not just productive and profitable today but one that we can pass on to our sons 25 years down the road. They are a daily reminder of the importance of sustainability. That is why we have diversified and started our direct farm sales; and that also is why we fully embrace using technology to farm better and with less impact on our surroundings.

Farming with a backdrop of rolling green pastures edged with woods and wedged between a mountain and a lake in a small New England town sometimes comes with preconceived notions. Often it seems people think that our farm is like something out of a Norman Rockwell painting. And indeed, passers-by have mistaken us for an organic dairy farm. Yet, we are a conventional operation and we believe that using tools such as biotech crops helps us to farm sustainably.

Biotechnology crops are essential to feeding our cows and calves. When we can, we pasture feed our livestock. But as the past 2 months have shown, harsh New England weather can make this impossible in winter and early spring. So during those months, we feed cows and calves grass that we have processed into hay or grass silage. Additionally, throughout the year we rely on both corn and soy based feeds to complete a total mixed ration that makes the best use of our grass by balancing the needs of our cattle with the nutrients our forages provide and filling in what is missing.

This gives us a unique perspective on the importance of biotechnology. I believe that biotech varieties improve efficiency and productivity of farming. I also believe that biotechnology enables us to lessen the environmental impact that growing can have because less fertilizer and pesticides are used to grow an abundant crop.

The use of biotechnology on our farm is also important to the economic sustainability of our small business. In speaking with our dairy nutritionist, he pointed out that the only non-GMO feed he could get us right now was organic. There simply is no non-GMO grain available to us, or the freight cost would be so prohibitive it's not a real option. Thus, an organic basic 20 percent protein complete feed would cost $750 per ton; the same conventional feed is currently $333 per ton. On our small farm, we purchase about 16 tons of grain per month. So, using 16 tons, that would more than double our grain bill, or in hard numbers we would spend $5,328 per month for regular feed or $12,000 per month on organic feed—a difference of $6,672 a month or $80,064 per year. I do not see how we could profitably farm in the long term with those increased feed costs. It is important to note that we choose to not be organic for several reasons and thus would not receive an organic premium for our milk even if we used the organic grain mix simply to feed a non-GMO feed.

As a small farm just starting out, we are constantly exploring new opportunities to grow our business. One of the things we have been looking at recently is growing our own corn and alfalfa. Given our location, we will need shorter-day corn varieties, meaning it would grow in less time than average. Here again, we would want the choice of the best seed regardless of breeding technology; genetic engineering offers the best options. Economically it makes the best sense. Incidentally, over 97 percent of the corn grown for silage in Vermont is biotech crop.

We face a challenge brought on by what many in agriculture see as the spread of misinformation about modern agricultural practices, creating the potential for limiting our ability to use biotechnology in order to best utilize the resources we have in sustainable ways. In many cases, this has already happened as we saw with the controversy over the use of recombinant Bovine Somatotropin (rBST), a technology that has no adverse effects on human health but was rejected by some consumers for no sound scientific reason. While many said that rBST was an example of the evils of "big agriculture," the truth is that many small dairy farms used rBST

as a way to improve and grow their businesses, better utilizing existing resources including land base and without needing more capital expenditures. Now, driven by the marketplace, our cooperative generally must restrict its members from using rBST. Thus, that option has effectively been taken away from us.

Now the agriculture industry is facing increased scrutiny for its use of biotechnology—a technology that has enabled farmers to increase yields while reducing the use of land, pesticides, fertilizers, water, and even fuel. Despite the fact that there is no credible study of biotech crops that has found them unsafe for human and animal consumption, some special interest groups are still choosing to spread misinformation, reject the technology and demand it be labeled on food products.

I welcome consumers who want to know more about how their food is produced—they have a right to know that the meals they serve at the family dining table every night is safe and nutritious. But a very small percentage of the population should not be able to impose their personal, non-science-based food preferences on the rest of us—prompting food prices to increase and driving farms like mine out of business.

Certainly, as a dairy farmer, increasing food and feed costs would have a devastating impact on my business. Beyond our farm gate, though, we know the impact would be just as brutal. Rural northeast Vermont, like many rural areas around the country, has a lot of good people who put in a hard day's work but are just barely getting by as best they can. This means that, for instance, 80 percent of the children in our elementary school receive free or reduced school lunches. It is their families who would suffer the most from price increases caused by mandatory biotech labeling—those who can least afford it.

As a mother and a consumer, I choose not to purchase organic or non-GMO food at the store. I will support my local community, however, and may purchase organic or non-GMO food at a farmers' market or directly at a farm stand. I generally do not believe in paying the higher premium for these foods because they provide no added nutritional or health benefits. With a growing family and a growing farm business, we have a lot of other places to spend our hard-earned money. Furthermore, I feel secure in the regulatory steps that have been taken to the food produced and available for sale in the grocery store to ensure it is safe to feed my family.

The fact is that American farmers offer consumers more food choices, while providing the safest food supply than any other time in our nation's history. Of course, living and working on a farm and being exposed to farm publications and reports, my view on how food is grown is different than that of a typical mom. There is information out there for those who are interested. It's just a matter of getting it from reliable sources. Some food companies are voluntarily labeling their products, some participate in the transparent USDA Certified Organic program and still some use third-party verification and a "Non-GMO" label.

Moreover, I feel even better knowing that food produced with biotechnology or biotech ingredients has been done so with some sort of advantage in mind—whether it's environmental, health or otherwise. I certainly do not believe a mandatory biotech label is necessary; in fact there are more responsible ways to spend [my] taxpayer monies. Be that as it is, if consumers are to drive some sort of label requirement I believe it should be done in a cohesive way at the Federal level.

You must be aware that recently my state, the State of Vermont, passed a mandatory GMO-labeling law. As you can guess, there has been a fair amount of chatter about it. I am frustrated with it. I believe that there are better uses of the state's time, and taxpayer resources, than imposing regulations on a technology that has been used and proven safe for over 2 decades. I am also concerned about the impact this law will have on the cost and availability of food in Vermont's grocery stores.

I might also add that in New England, states are very close and it is very easy and often more convenient at times to cross borders for various reasons. Our farm, for example, is not too far from the border with New Hampshire; we can get there in an hour. If the Vermont labeling law is activated, there will likely be one label on food in Vermont, and another on the exact same products in New Hampshire and the rest of the country raising questions about whether or not the product is actually the same. This serves no one's interests—not consumers, not farmers, not food producers.

Further, our close-knit surrounding states are considering their own GMO-labeling bills. Currently, the Vermont law exempts meat and dairy from being labeled. Others may not exempt those products. As I sell my Jersey beef, processed at a USDA certified facility, to people in other states, this may directly affect my product and my ability to market it.

In all of this, I think that it is so important for there to be an ongoing conversation with consumers about this topic. Too many times, farmers feel like they just need to tell their stories better and to "educate"; while this is part of it, I think that

we also need to do a better job of listening to consumers, to their questions and concerns and addressing them.

I volunteer for an online effort called Ask the Farmers. It is a collaborative resource made up of farmers from all across the country and Canada; and from all different aspects of farming—animal ag, biotech crops, organic, conventional, small, large, *etc.,* I'm very excited to help in an effort to put more good information out there—be it for genetic engineering, dairy farming, animal welfare, balancing life with work, farm or family. I am happy to continue to speak up for our right to farm in the best way we know possible; which in our case includes biotechnology.

I will continue to pursue an active presence on Facebook, Twitter and Instagram as well as more traditional communication routes via newspapers, church meetings or everyday conversation, sharing articles and ideas along with my knowledge about the opportunities and challenges we face as modern-day farmers and parents. If I have one person or ten people reach out to me for a question or appreciating my hands-on and practical perspective from the farm, then I have succeeded. And I have.

I may add that I testified at a Subcommittee hearing on this very topic last summer and received some rude comments from total strangers on social media. I tried to start a conversation with those folks who were interested in having one and ignored those who were more interested in making personal comments and being bullies. It was not always the most pleasant experience, but being a dairy farmer I'm used to having to do dirty jobs from time to time. But even with those negative encounters, or maybe because of them, I was eager to come back to share my experiences with all of the Members of the Committee.

I personally believe that there is room for many different styles of responsible farming—the freedom to operate your business or organize your life as you see fit is one of the things that makes America great and our economy strong. I also believe that biotechnology plays a major role in our collective ability to not only feed a growing global population, but to also make individual improvements on our own farms be it 50 cows or 5,000 cows; a cash crop operation or an apple orchard; a multiple-generation farm or a beginning farmer. Even though less than two percent of the U.S. population now lives on farms or is actively involved in farming, agriculture comes in all different sizes and shapes and we need every one of them. Just as importantly, we give consumers options when they go to the grocery store.

We know more now than we have ever have about growing food, or caring for animals, and this helps us to achieve a level of productivity that previous generations of farmers would envy. I am proud of how far the American farmer has come, just as I am proud of how far we have come on our own farm.

Thank you again for the opportunity to be here today and to share my experience with biotechnology.

**About Agri-Mark**

Agri-Mark, with more than a billion dollars in 2014 sales, markets more than 300 million gallons of farm fresh milk each year for about 1,200 dairy farm families in New England and New York. The cooperative is headquartered in Methuen, Mass., has been marketing milk for dairy farmers since 1913, and actively represents their legislative interests in the Northeast and in Washington, D.C.

**About the National Council of Farmer Cooperatives**

Since 1929, NCFC has been the voice of America's farmer cooperatives. NCFC values farmer ownership and control in the production and distribution chain; the economic viability of farmers and the businesses they own; and vibrant rural communities. We have an extremely diverse membership, which we view as one of our sources of strength—our members span the country, supply nearly every agricultural input imaginable, provide credit and related financial services (including export financing), and market a wide range of commodities and value-added products.

American agriculture is a modern-day success story. America's farmers produce the world's safest, most abundant food supply for consumers at prices far lower than the world average. Farmer cooperatives are an important part of the success of American agriculture. Cooperatives differ from other businesses because they are member-owned and are operated for the shared benefit of their members.

Farmer cooperatives enhance competition in the agricultural marketplace by acting as bargaining agents for their member' products; providing market intelligence and pricing information; providing competitively priced farming supplies; and vertically integrating their members' production and processing. There are over 3,000 farmer cooperatives across the U.S., and earnings from their activities (known as patronage) are returned to their farmer members, helping improve their members' income from the marketplace.

**About the National Milk Producers Federation**

The National Milk Producers Federation (NMPF), based in Arlington, Va., develops and carries out policies that advance the well-being of U.S. dairy producers and the cooperatives they collectively own. The members of NMPF's cooperatives produce the majority of the U.S., milk supply, making NMPF the voice of nearly 32,000 dairy producers on Capitol Hill and with government agencies. For more on NMPF's activities, visit *www.nmpf.org*.

The CHAIRMAN. Thank you. I appreciate that. Mr. Clarkson?

## STATEMENT OF LYNN CLARKSON, PRESIDENT AND FOUNDER, CLARKSON GRAIN COMPANY, INC., CERRO GORDO, IL

Mr. CLARKSON. Chairman Conaway, Ranking Member Peterson, and other Members of the Committee, thank you for inviting me here today. I am the President of Clarkson Grain Company located in Cerro Gordo, Illinois. Clarkson Grain was founded in 1974 by the Clarkson family, pioneering direct delivery marketing to link farmers directly to end-users. From that beginning, we have grown into a grain, oilseed, and ingredient supplier to manufacturing companies making food and animal feed with clients around the world. The company procures its raw materials, primarily corn and soybeans, from farmers in the United States and Canada. We operate our own commercial storage, cleaning, and handling facilities, a barge station, rail sidings. Our products include corn and soy flours, masa, lechitin, whole grains, organic, non-GMO and GMO.

United States farmers excel in delivering the lowest cost agricultural products with a grade standard acceptable to clients. Since our inception, we have segregated corn and soy by variety and market distinction to realize greater value for producers and end-users. Buyers of these identity preserved grains are now asking for features that guarantee their access to particular markets such as GMO specific, non-GMO, and organic. Such buyers range from small family companies to the largest food manufacturers. Shipments range from a small bag to 55,000 ton vessels.

These market preferences are increasingly defining both our domestic and international markets. To secure corn and soy sought by these buyers, we contract with farmers before planting to get particular varieties raised in accord with buyers' wishes. We secure grower cooperation by paying premiums.

Our goal is simple: a happy client. We are not in the business to win a scientific or political argument. We are in business to please clients seeking legitimate product distinctions. We don't tell clients what they should want. We ask them what they want and try to get it for them.

As an identity preserved (IP) merchant, Clarkson Grain is not at all opposed to the development and commercialization of GMO crops. Producers and their supply chain partners however need to recognize that production and handling of any crop has to be conducted in such a way that preferred market access is recognized and honored. Neighboring farmers must have the ability to serve their preferred markets, whether GMO, non-GMO, or organic. Market access and choice are critical to this. Wherever you fall on the GMO spectrum, it is clear to me as an ingredient supplier that an increasingly significant percentage of consumers want additional transparency in labeling. These consumers, the GMO sensitive,

have certainly proved themselves to be a significant and vocal voice for transparency in labeling.

The cost of disregarding this voice is increased social conflict, expensive political battles, and uncertainty provided by prolonged court cases. For farmers who use GMOs, this process prolongs the difficulty for the biotech industry to bring traits responsibly into the market. Everyone would win if we could lower the temperature and manage the conflict over GMO technology.

One critical way to lower the temperature is through a rational uniform national standard for the labeling of food that is not produced using GMO traits. Such an action is in the fundamental interests of both consumers and farmers. Consumers have a right to exercise their choice and avoid. Farmers have a right to take advantage of this new market. The creation of a standard could be accomplished through a mandatory labeling scheme, but it is my belief that a more appropriate approach is through a voluntary labeling program. I believe that such approach would be less contentious, less adversarial, and less expensive.

I believe we are in a similar place to where we were with emerging organic market in the early 1990s. At that time differing state standards for organic products were emerging. The result was consumer confusion. Independent companies jumped in. More confusion. Each one was saying their standard was better than the next. So it was a negative for the entire sector.

Once the organic sector settled on a uniform national definition responsibly overseen by the USDA, consumer confidence returned and served as the fundamental rationale for explosive growth.

It is my belief the non-GMO market would also grow if it had a uniform national standard overseen by the USDA. The USDA has a world-class reputation of managing process-verified programs. It seems to me to be straightforward. Let Congress establish a uniform standard, let USDA oversee it, step back, and let the marketplace work as it does.

To sum up, I want to offer one more rationale for establishing a uniform standard. Labeling drives other activities along the supply chain such as seed production. Many producers struggle with a lack of appropriate non-GMO seed. For all these pieces to work together within a reasonable time frame, farmers must have access to an adequate supply.

So in closing I ask for several things. First, Congress to support a farmer's freedom to produce for his preferred markets without being dominated by his neighbor's market decisions. I ask Congress to support through adequate funding, research in non-GMO corn and soy varieties. I ask Congress to support a farmers' choice of hybrids or quality attributes, GMO presence or absence, or organic or non-organic. I ask Congress to help those of us in the countryside to always balance and respect a producer's production decisions as they provide a safe and abundant food supply for the world's needs.

Thank you. I would be happy to answer any questions later

[The prepared statement of Mr. Clarkson follows:]

PREPARED STATEMENT OF LYNN CLARKSON, PRESIDENT AND FOUNDER, CLARKSON GRAIN COMPANY, INC., CERRO GORDO, IL

Chairman Conaway, Ranking Member Peterson, and other Members of the Committee, thank you for inviting me here today to talk about the costs and impacts of mandatory biotech labeling laws. My name is Lynn Clarkson. I am the President of Clarkson Grain Company, Inc., located in Cerro Gordo, Illinois, a small rural community about 3 hours south of Chicago.

Clarkson Grain was founded in 1974 by the Clarkson family, which pioneered "Direct Delivery Marketing" to link farmers directly to end-users. From that modest beginning, we have grown and evolved into a grain, oilseed, and ingredient supplier to the food manufacturing and animal-feed industries serving clients around the world. The company procures its raw materials—particularly corn and soy from farmers in the United States and Canada.

We operate our own commercial storage, cleaning and handling facilities as well as organic soy processing facilities, a barge station and rail sidings. Our products include corn and soy flours, masa, meal, refined soy oil, lechitin, whole grains, and organic and non-GMO grains and oilseeds.

United States farmers and its supply chain partners like us excel in delivering the lowest cost agricultural products within a grade standard acceptable to clients around the world. Since our inception, we have segregated corn and soy by variety and market distinction to realize greater value for our producers and end-users. Buyers of these Identity Preserved (IP) grains are now asking for features that guarantee their access to particular markets such as GMO specific, non-GMO and organic.

Such buyers range from small family companies to the largest food manufacturers, starch and oil processors and feeders. Shipments range from small bags to 55,000 ton ocean vessels.

These market preferences are increasingly defining both our domestic and international markets. To secure corn and soy sought by these buyers, we contract with farmers before planting to secure particular varieties raised in accord with buyers' wishes. We secure grower cooperation by paying premiums that justify continuing participation in IP programs year after year.

Our goal is simple; a happy client. We are not in business to win scientific or political arguments. We are in business to please clients seeking legitimate product distinctions. We don't tell clients what they should want. We ask them what they want and help them find it.

In the early days of our business, our major challenge was to keep corn and soy types segregated by variety. Buyer, seller, and grower could visibly see the distinctions. That changed with the commercial introduction of GMO traits. Within a few years, GMO sensitive markets brought new distinctions into play. For example, in those early days, Japanese buyers for the soyfood industry worked with the Association of Official Seed Certifying Agencies to develop testing and segregation protocols.

As an IP merchant, Clarkson Grain is not at all opposed to the development and commercialization of GMO crops. Producers and their supply chain partners however must recognize that production and handling of any of any crop has to be conducted in a way so that preferred market access is recognized and honored. Neighboring farmers must have the ability to serve their preferred markets—whether GMO, non-GMO or organic. Market access and choice must be preserved. I believe that this respect and recognition can occur.

Wherever you fall on the pro- or anti-GMO spectrum, it is clear to me as an ingredient supplier that an increasingly significant percentage of consumers want additional transparency in labeling so that they may purchase the food types they and their families desire. These consumers what one might call, GMO sensitive, have certainly proved themselves to be a significant and vocal voice for increased transparency in food labeling.

The cost of disregarding this voice is increased social conflict, expensive political battles, and uncertainty provided by prolonged court cases. For my farmers in Illinois who use GMO's this process simply prolongs the difficulty for the biotech industry to bring traits responsibly into the market. Those concerned about GMOs however deserve to be respected even while the biotech industry continues its efforts to market its traits at the consumer level. Everyone would win if we could lower the temperature and manage the conflict over GMO technology.

I am convinced that one critical way to lower the temperature is through a rational uniform national standard for the labeling of food that is not produced using GMO traits. Such an action is in the fundamental interests of both consumers and farmers. Consumers have a right to exercise their choice to avoid GMOs. Farmers have a right to take advantage of this new market. The creation of a standard could

be accomplished through a mandatory labeling scheme but it is my belief that a more appropriate approach is through a voluntary labeling program. I believe that such an approach would be less contentious, less adversarial and less expensive.

Here's why I have reached my conclusion. I believe we are at a similar place in the labeling of non-GMO products to that of the emerging organic market in the early 1990's

At that time differing state standards for organic products were beginning to emerge. The result was consumer confusion. With no uniform national organic standard, states were free to tout their differences. The private-sector also got into the act. There were numerous private certifiers each claiming to be better than the other. Consumers didn't understand these differences but more importantly they became put off by the sniping in the marketplace. As a result, the entire sector suffered.

Once the organic sector settled on a uniform national definition, responsibly overseen by the U.S. Department of Agriculture, consumer confidence returned and served as the fundamental rationale for the explosive growth we currently see within the sector. U.S. sales of organic products in 2013 were $35.1 billion. This remarkable growth rests on one thing; a uniform national standard, responsibly, overseen by a Federal agency.

It is my belief the non-GMO market would also grow if there were a uniform national standard, overseen, by USDA. USDA has world class expertise in managing process verified programs. It seems to me to be straightforward. Let Congress establish a uniform standard, let USDA oversee it, step back and let the marketplace work.

As I begin to sum up, I want to offer one more rationale for establishing a uniform standard or definition of a non-GMO label. Labeling drives other activities along the supply chain such as seed production. Many producers struggle with a lack of appropriate non-GMO corn and soy varieties to meet specific market needs.

I am convinced a national non-GMO labeling program would send a clear single to input suppliers such as seed breeders that the non-GMO marketplace is here to stay. I do not believe that would be the case is we had a proliferation of state labeling programs. I believe non-GMO is a legitimate and growing market and that consumers deserve to know what that is in their food so can make their choices with their hard-earned dollars.

For that to occur within a reasonable time frame, farmers must have access to an adequate supply of high yielding non-GMO corn and soy varieties.

In closing I offer the following thoughts as you consider an appropriate role for Congress to take in this emerging marketplace:

1. I ask Congress to support a farmer's freedom to produce for his preferred markets without being dominated by his neighbor's production choices. As you can see this sword cuts both ways.
2. I ask Congress to support through adequate funding, research in non-GMO corn and soy varieties so that farmers might rapidly access this new market.
3. I ask Congress to support a farmers' choice of hybrids or quality attributes, GMO presence or absence, or organic or non-organic production methods.
4. And I ask Congress to help us in the countryside to always balance and respect a producer's production decisions as they provide a safe and abundant food supply for the world's needs.

Thank you for this opportunity. I am happy to answer any questions you might have.

The CHAIRMAN. Thank you, Mr. Clarkson. Mr. Dempsey?

**STATEMENT OF THOMAS W. DEMPSEY, JR., PRESIDENT AND CHIEF EXECUTIVE OFFICER, SNACK FOOD ASSOCIATION, ARLINGTON, VA**

Mr. DEMPSEY. I want to thank the Committee, Chairman Conaway, and Ranking Member Peterson for holding this hearing to provide a balanced review of one of the most critical issues facing the food industry today, the labeling of genetically modified organisms, or GMOs.

My name is Tom Dempsey. I have served as the President and Chief Executive Officer of the Snack Food Association since 2013.

Prior to joining SFA, I was the President of one of the largest privately owned snack brands in the United States. We represent over 400 companies in the snack industry. My members include both billion-dollar multi-category companies and small family-owned businesses in the second and third generation of management. More than ½ of SFA members have sales of less than $100 million a year, and many are the primary employers in their communities.

Mandatory GMO labeling would impact nearly every aspect of my members' businesses, upping costs by requiring increased product inventory, added complexity for packaging and distribution processes, and extensive new regulatory and training requirements. Absent a Federal solution, manufacturers will have essentially three options to comply with a state GMO labeling law: redesign their packaging, reformulate products so that no labeling is required, or halt sales to that state. Each option is difficult, costly, time-intensive, and at worst, could eliminate jobs and consumer choice in the marketplace. Smaller companies may not have these options at all.

A patchwork of mandatory GMO labeling laws would pose significant burdens on the manufacturing process itself. They would require separate storage for GMO and non-GMO products throughout the entire supply chain beginning with the farmer and extending through the various stages of production and distribution. Aside from new administrative and recordkeeping burdens, snack makers would be forced to clean and boil the sheeting, baking, frying, and seasoning lines between GMO and non-GMO production runs with extensive time costly delays.

Duplicative film labeling for the same stock keeping unit or SKU assigned to each product line is also a problem. Film, the industry's term for snack bag packaging, would need to be changed mid-production and two separate inventories of the same finished product must be kept. If one, ten, or 25 states enact different GMO labeling laws, this process would become even more burdensome and difficult to comply with, particularly from an interstate commerce perspective.

Significant lead times and costs would also go into bag changes. The cost in plate charges, new film, and administrative oversight could be more than $750,000 for 800 SKUs, and the process could take 20 to 26 weeks.

GMO and non-GMO producers must continue to be segregated by state, from the factory to the grocery store, resulting in increased distribution costs and heightened opportunity for mistakes.

To be clear, the hardest hit by this will be one-plant operators with a single line of production. These costs could put family-owned businesses out of business and increase consolidation in the industry.

While it is sometimes assumed that companies could remove GMO ingredients from their products, this is unrealistic because the availability of non-GMO crops, as you have heard, is limited. Over 80 percent of the corn, cotton, and soybean crops in the United States are produced with biotechnology, all of these products, which are staple items in the snack food production.

Our members will not have the opportunity to increase their contracts with farmers or mills for non-GMO corn, for instance, for

over 2 years. Transitioning to GMO-free production will not happen overnight from genetically engineered plants.

Some manufacturers may choose to end distribution in states that require GMO labeling resulting in fewer product options for consumers and causing a ripple effect in the grocery industry. Even if manufacturers notify grocers of their intent to stop selling in a state, manufacturers could run the risk of being fined if retailers do not comply or if mistakes happen in the distribution process.

Fewer players in the aisle could mean less incentive to keep quality high and prices low. Fewer products could disproportionately cause job losses for some in the distribution chain.

Ultimately, a patchwork of state GMO laws will hit consumers the hardest in result in either increased cost at the grocery store or less availability of products on store shelves. Current Federal law mandates food labels for safety and nutritional purposes, and because GMOs as you have heard have proven to have no material difference than non-GMOs, there is no food safety or nutritional difference that requires an additional label. Going down a path which calls for mandatory GMO labels sets a bad precedent for future calls for mandatory labels for issues that are not related to food safety or nutrition.

Consumers already have the option to purchase non-GMO foods, and these options continue to expand. For over a decade, both the USDA's National Organic Program and the independent Non-GMO Project have certified that foods are organic and GMO-free respectively.

Many SFA members have already made the significant investment in marketing decisions to display these voluntary labels. Forcing companies to re-label more than 80 percent of their products does nothing but add cost, confusion, and may limit the choices.

SFA does not have a single member company that manufactures, distributes, and sells in just one state which makes a state labeling law incredibly complex. Multiply these challenges by five, ten, or 25 states and an insurmountable burden is placed on the supply chain. SFA supports a voluntary labeling standard which eliminates the proposed patchwork of state laws and allows the market forces that are already in place to continue to inform the consumer. As more and more states continue to pursue different mandatory GMO labeling laws, manufacturers and consumers alike need the consistency of a Federal standard, and we need it urgently.

Thank you for your time and consideration.

[The prepared statement of Mr. Dempsey follows:]

PREPARED STATEMENT OF THOMAS W. DEMPSEY, JR., PRESIDENT AND CHIEF EXECUTIVE OFFICER, SNACK FOOD ASSOCIATION, ARLINGTON, VA

**Introduction**

First, I would like to thank the House Agriculture Committee, Chairman Conaway, and Ranking Member Peterson for holding this hearing to review of one of the most critical issues facing the food industry today, the labeling of genetically modified organisms, better known as GMOs. I appreciate the opportunity to be here.

My name is Tom Dempsey. I have served as the President and Chief Executive Officer of the Snack Food Association (SFA) since 2013. Prior to joining SFA, I was the President of one of the largest privately owned snack brands in the United States (U.S.) where I spent 24 years in total, 5 of which I served as the President overseeing all areas of sales, marketing, finance, human resources, manufacturing,

distribution, research and development, and purchasing. Today at SFA, I represent more than 400 companies who produce a wide variety of snacks ranging from potato, tortilla, and pita chips to pork rinds and meat snacks, to crackers, popcorn, granola bars, and trail mix, as well as dried fruit and nut mixtures. SFA members range from billion-dollar multi-category companies to small family owned and operated businesses, some of which are in the second and third generation of management. More than half of SFA members do less than $100M/year in sales and many are the primary employer in their community.

**GMO Labeling Debate**

Over the last several years there have been a number of state ballot initiatives calling for mandatory GMO labeling. While voters have rejected ballot initiatives calling for mandatory GMO labeling in four states: California, Washington, Colorado, and Oregon, the Vermont State Legislature approved the nation's first mandatory GMO labeling law, Act 120, in April 2014. Two other states, Connecticut and Maine have mandatory GMO labeling laws on the books, but don't become effective until certain population or surrounding state triggers are met. In addition, since January 2015, 28 states and Puerto Rico have introduced over 70 different pieces of legislation calling for some type of mandatory GMO labeling of foods.

Mandatory GMO labeling at the state level would impact nearly every aspect of SFA members' business, upping costs by requiring increased product inventory, added complexity for packaging and distribution processes, and extensive new regulatory and training requirements.

Absent a Federal GMO solution, manufacturers will have essentially three options in order to comply with a state labeling law such as Vermont's Act 120: order new packaging for products, reformulate products so that no labeling is required, or halt sales to that state. Each option is difficult, costly, time-intensive, and at worst, could eliminate jobs and consumer choice in the marketplace which I will further discuss. I will also outline why some food manufacturers, most likely small and midsize family businesses, do not have all of these options available and could be impacted the most.

**Production Processes**

One of the biggest barriers that prevents a company from complying with state by state GMO labeling laws is the manufacturing process itself.

First, it would require separate storage for GMO and non-GMO products throughout the entire supply chain. Farmers will need to separate their crops in planting and when transporting to grain elevators or manufacturers. Once a grain elevator or manufacturer receives the raw materials from farmers they too will need to store and produce GMO and non-GMO materials separately. Aside from new administrative and recordkeeping burdens, manufactures will need to add separate storage areas to their facilities in order to segregate these products. Tortilla processing provides an excellent example. The story begins with the corn. There are two ways to begin the process: one, by cooking the corn into a mash and the other by purchasing corn masa (flour), adding water to it, and then sheeting it for cutting into the triangle shapes we all know as tortilla chips. A mandatory labeling scheme would require two different silos to hold GMO and non-GMO bulk corn and masa (flour).

Given the expense of manufacturing machinery, snack makers may be forced to use the same equipment and conduct thorough cleaning of the sheeting, baking, frying, and seasoning lines between GMO and non-GMO production runs to ensure no contamination occurs. Such a process could take nearly 2 hours and would lead to a loss in valuable production time. It is not likely a manufacturer would have the financial means or the floor space to invest in separate equipment for GMO and non-GMO production.

Another complicating factor is the need for duplicative labeling film for the same stock keeping unit or SKU assigned to each product line. In order to comply with a state labeling law, our members will need to change film in mid-production and then keep two separate inventories of the same finished product: one with GMO identification specifically for sale in a state that enacts mandatory GMO labeling, and the other for the rest of the distribution area. Companies would not be able to use a single state-required label for all of its products if a patchwork of varying state rules were enacted. Separating finished products for not only one, but five, ten, or even twenty states with various labeling requirements would be incredibly challenging and nearly impossible for a manufacturer to carry out. Such a labeling scheme impedes on interstate commerce.

Significant lead times and costs also go into a bag design change. One SFA member estimated they would need to change over 800 SKUs to continue to sell in Vermont alone. The cost in plate charges, new film, and administrative oversight

in this instance could be more than $750,000. The actual cost of the run after converting the film would be approximately 25 percent higher due to the shorter production runs of non-GMO product that would be required to fulfill orders in Vermont, for example. The actual process of designing, compliance review, plate making, and lead-time for film would be 20–26 weeks. This would become even more complicated if additional states pass their own onerous regulations with different specific requirements.

After production, the distribution of most snack foods comes off, in most cases, a route truck with direct service to the grocery store. A state law such as Vermont's Act 120 will mandate a dual inventory for each SKU for every step along the distribution channel. The end result will be increased distribution costs and heightened opportunity for mistakes.

To be clear, the hardest hit by this will be the small, family-owned companies with just one plant or just a single line of production. Quite frankly, these costs could put some companies out of business and thereby increase consolidation in the industry by reducing the players to a few multi-category, multi-national players that can better take on the added cost of sourcing and segregating GMO and non-GMO crops. All of these changes will add final product costs to the consumer. The precise amount of added cost depends on each company's cost structure.

**Sourcing Challenges**

In order to avoid the need for duplicate labels in a state like Vermont, it is sometimes assumed that companies could simply remove the GMO ingredients from their products altogether. This is unrealistic because the availability of non-GMO crops is very limited. My understanding is that over 80 percent of the corn, cotton, and soybean crops in the U.S. are harvested from genetically engineered plants.[1] Snack food companies purchase a large majority of their ingredients derived from these plants.

For instance, the process for producing potato chips begins with developing a large network of growers for potatoes, contracting quantities in advance of plantings and harvests, and purchasing cooking oils such as cottonseed or soybean in advance to secure quantities and pricing. The same goes for other crops. One tortilla chip manufacturer told me that they would not have the opportunity to increase their contracts for non-GMO corn for a minimum of 2 years. Transitioning to GMO-free production could not happen overnight, or even by 2016, as is specified in Vermont's Act 120, for example.

**Impact on Consumers and the Economy**

On the other hand, manufacturers could also choose to end the distribution of their lines specifically in states that require mandatory GMO labeling. However, ceasing distribution isn't simple. Aside from limiting product options to consumers, there would be a ripple effect in the grocery industry. Retailers would need to be notified of the decision to stop selling in a state and manufacturers could run the risk of being fined if retailers do not comply.

Fewer players in the aisle could mean less incentive to keep quality high and prices low. Decreased promotion and distribution means fewer route sales people needed to deliver the product and job losses for some in the distribution chain, such as drivers, warehouse personnel, account executives, and field management. Fewer jobs could also lead to a decrease in tax revenue in a particular state.

Ultimately, a patchwork of state and local GMO labeling laws will hit consumers the hardest resulting in either increased costs at the grocery store or less availability of products on store shelves.

A recent study performed by economists at Cornell University concluded that mandatory GMO labeling laws would increase the cost of food by about $500 per family per year on average with some families bearing an increased cost of up to $1,500 per year.[2] These amounts don't include the regulatory costs the government will incur to actually implement the law that would likely be passed onto consumers in the form of taxes.

**Role of Labels**

Current Federal law mandates food labels for safety and nutritional purposes. And because GMO's have proven to have no material difference than non-GMOs,

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[1] United States Department of Agriculture Economic Research Service. "Recent Trends in GE Adoption". July 14, 2014. Retrieved from: *http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx*.

[2] Dyson School of Applied Economics and Management, Cornell University. "Costs of Labeling Genetically Modified Food Products in N.Y. State". May 2014. Retrieved from: *http://dyson.cornell.edu/people/profiles/docs/LabelingNY.pdf*.

there is no food safety or nutritional difference that requires an additional label. Going down a path in which calls for mandatory GMO labels sets a bad precedent for future calls for mandatory labels for issues that are not related to food safety or nutrition.

**GMO-Free Options Already Exist**

While we firmly believe the science shows that our GMO products are safe, SFA members support providing consumers with options in the marketplace. It is important to note that consumers can already choose to purchase non-GMO items and these options continue to expand. For over a decade both the United States Department of Agriculture's (USDA) National Organic Program and a nonprofit organization, the Non-GMO Project have certified foods which are organic and non-GMO, respectively. A company cannot display a USDA Organic Seal or a Non-GMO Project Verified Seal without going through an intensive and costly certification process. The Non-GMO Project alone has certified over 20,000 non-GMO products and this number continues to grow.

Many SFA members have already made the large investment required to gain these voluntary certifications that give our customers the freedom to choose between products that are produced, distributed, and marketed as Organic and non-GMO and labeled as such. Forcing companies to re-label more than 80 percent of their current products does nothing but add cost, confusion, and, ultimately, may limit the choices available to consumers.

**Conclusion**

SFA is concerned both about the burden state-level GMO labeling would put on interstate commerce, as well as the increased costs that could drive food companies out of business or increase food prices for consumers while potentially limiting their options in the marketplace.

SFA does not have a single member company that manufactures, distributes, and sells in just one state making a state labeling law incredibly complex to deal with. Multiply the challenges I've presented here for compliance in Vermont's Act 120 times five, or ten, or even 25 states and you place an insurmountable burden on our food supply chain and add significant increased cost to our consumers.

For this reason, SFA supports Federal legislation which eliminates the current proposed patchwork of state GMO labeling laws by creating one voluntary GMO standard which eliminates confusion, advances food safety, and provides much-needed consistency for manufacturers and our consumers.

Again, thank you for your time and consideration of our views. I look forward to answering your questions.

The CHAIRMAN. Thank you, Mr. Dempsey. Mr. Policinski? Chris, go ahead, 5 minutes. I am sorry about that.

## STATEMENT OF CHRIS POLICINSKI, PRESIDENT AND CHIEF EXECUTIVE OFFICER, LAND O' LAKES, INC., ARDEN HILLS, MN

Mr. POLICINSKI. Thank you. Thank you, Chairman Conaway, Ranking Member Peterson, and Members of the Committee. Thank you for holding today's hearing on the costs and impacts of mandatory biotechnology labeling laws.

I appreciate the opportunity to testify on this important issue. I am Chris Policinski, President and CEO of Land O' Lakes. I also serve as Chairman of the National Council of Farmer Cooperatives and am a Board Member of the Grocery Manufacturers Association.

Land O' Lakes, based in Arden Hills Minnesota, is a farmer-owned cooperative, meaning it is owned, governed, and controlled by farmers and local agricultural cooperatives. Land O' Lakes touches more than 300,000 farmers across the country making us well-positioned to understand the benefits of biotechnology and the impact of measures designed to mandate the labeling of GMO products.

Biotech crops have been around for 2 decades and provide extraordinary benefits to farmers and consumers: higher crop yields per acre, less tilling of the land, decreased use of natural resources

such as water and land, reduced use of insecticide, better soil quality, and lower consumer prices are just some of the benefits GM crops provide.

Despite these benefits and the proven safety of GMOs, some are pushing for states to pass laws that would mandate the labeling of GMO foods. We are told this is about consumer choice. The consumers already have these choices and many others. Some choose to pay a premium for food that is produced by certain methods, such as organic or does not contain certain ingredients, such as those that are gluten-free. Others prioritize affordability, accessibility, convenience, or taste. Voluntary labeling currently presents all of these choices in the marketplace, and that is the model that should exist for GMO labeling as well.

Mandating GMO labeling runs contrary to the essential purpose of government-mandated labeling, which is to provide consumers with accurate and relevant information regarding the safety of the foods they eat. Every major health and regulatory organization has found that GMOs are as safe as any other food and as such do not require any special labeling.

Mandated GMO labeling is an effort to stigmatize a form of technology in an attempt to drive it out of the marketplace. You don't have to take my word for it. Two months ago an activist association published an article admitting that the push to enact state-wide GMO labeling is part of a larger effort to drive GMOs off the market. In addition to stigmatizing biotechnology, a state-by-state patchwork of mandated food labeling laws would be a logistical nightmare creating dozens of different standards, different definitions, and different exemptions.

Fortunately, Congress has the authority and the responsibility to protect the free flow of goods across state lines. Uniformity in our nation's food labeling ensures consumers have consistent, accurate information on dairy, poultry, meat, and other foods. Under Federal preemption, Congress can create a voluntary uniform national solution to the labeling of food products derived from ingredients using biotechnology. The value of this approach is that it not only respects a consumer's right to choose but it also respects a farmer's right to choose to use a safe, proven technology.

Stigmatizing GMO foods through a patchwork of state labeling mandates or even mandatory Federal labeling jeopardizes innovation and threatens the future of development and use of technology in agriculture. As a result, farmers will have fewer choices of what to plant. We will see higher costs due to crop segregation, lower yields, a decline in productivity, and an increased environmental footprint. That is dangerous for everyone.

And this threat is real and imminent. There is currently some form of GMO labeling legislation pending in over ½ of our state legislatures, and Vermont's GMO labeling mandate is scheduled to take effect next year. That is why I strongly urge Congress to enact a common-sense law that will provide farmers and consumers with the clarity and certainty needed for meaningful, voluntary food labeling.

Last year our company supported the Safe and Accurate Food Labeling Act, and we understand that similar legislation will be introduced soon. Updates to the bill from last year may include the

creation of a voluntary, non-GMO verification program run by the U.S. Department of Agriculture. We would support such a provision which would ensure that consumers get accurate information while preserving choices available to shoppers and farmers.

Thank you again for the opportunity to testify before this Committee. I look forward to working with each of you this year to pass a common-sense solution that meets the demands and expectations of the American people.

[The prepared statement of Mr. Policinski follows:]

PREPARED STATEMENT OF CHRIS POLICINSKI, PRESIDENT AND CHIEF EXECUTIVE OFFICER, LAND O' LAKES, INC., ARDEN HILLS, MN

Chairman Conaway, Ranking Member Peterson, and Members of the Committee, thank you for holding today's hearing on the costs and impacts of mandatory biotechnology labeling laws. I appreciate the opportunity to testify on this important issue. I am Chris Policinski, President and CEO of Land O' Lakes, Inc. I also serve as Chairman of the National Council of Farmer Cooperatives, am on the Board of the Grocery Manufacturers Association, and have over 30 years of experience in the food and agriculture industry.

**Background on Land O' Lakes, Inc**

Land O' Lakes, Inc., based in Arden Hills, Minnesota, is a farmer cooperative, meaning it is owned, governed and controlled by farmers and local agricultural cooperatives. Land O' Lakes, Inc. touches more than 300,000 farmers across the country.

While Land O' Lakes is best known for our dairy business, we are also comprised of two other important business units: Winfield, one of the country's leading distributors of agricultural seed and crop protection products; and Purina Animal Nutrition LLC, which provides a valued portfolio of complete feeds, supplements and ingredients for animals and livestock.

Our company touches nearly every aspect of the food supply chain—from farmers, to seeds, to production, to handling, to food processing and distribution, to consumer foods sales and marketing. Within those sectors, we also represent a cross-section of preferences and products. For example, we sell biotech, conventional and organic products. This broad and diverse business model makes Land O' Lakes well positioned to understand the benefits of biotechnology, and the impact of measures designed to mandate the labeling of GMO products.

**Benefits of Biotechnology**

Biotech crops have been around for 2 decades, and provide extraordinary benefits to farmers and consumers. Higher crop yields per acre; less tilling of land; decreased use of natural resources such as water and land; reduced use of insecticide, better soil quality, and lower consumer prices are just some of the benefits GM crops provide.

As the head of a broad agricultural and food company and speaking on behalf of our farmer-owners, providing consumers with safe, nutritious, affordable food is our number one priority each and every day. That is why we have embraced biotechnology.

Our farmers and cooperatives don't just use biotechnology, they have adopted this technology very quickly. That's because the benefits that biotechnology provides across the board—for producers, the environment and to consumers—are substantial and have been well-established over decades.

Our farmers have also adopted this technology because they have confidence in the safety of biotechnology. Time and again, biotechnology and genetically modified ingredients have been proven safe by organizations such as the American Association for the Advancement of Science, the World Health Organization, the U.S. Food & Drug Administration, the American Medical Association, and more. Today, 70–80% of the foods we eat in the United States contain ingredients that have been genetically modified.

**Options in the Market for Consumers**

We know that customers want accurate and consistent information about the food they are buying because we talk with them constantly. We also know that different customers prioritize information differently. Our cooperative's branded lines voluntarily offer many products to meet specific consumer preferences, such as organic,

cage-free and low fat. The U.S. Department of Agriculture's Certified Organic program is a prime example of an effective system that informs consumers and certifies products which are available in most grocery stores across the U.S.

Consumers should, and do, have choices in the marketplace. Some choose to pay a premium for food that is produced by certain methods, such as organic, or that does not contain certain ingredients, such as those that are gluten-free. Others prioritize affordability, accessibility, convenience or taste. Voluntary labeling currently presents all of these choices in the marketplace, and that is the model that should exist for GMO labeling as well.

**Mandatory, Varying Standards Creates Chaos**

Instead, some are pushing for a different approach. They are working in states to pass laws that would mandate the labeling of GMO foods.

Mandating GMO labeling runs contrary to the essential purpose of government-mandated labeling—which is to provide consumers with accurate and relevant information regarding the safety of the food they eat.

Every major health and regulatory organization has found that GMOs are as safe as any other food and as such do not require any special labeling. This is what our own FDA has concluded and is further supported by a 2011 summary report from the European Commission covering a decade of publicly funded research, 130 research projects and 500 research groups, which concluded there is no scientific evidence of higher risks from GE crops.

Mandated GMO labeling is an effort to stigmatize a form of technology and attempt to drive it out of the marketplace. You don't have to take my word for it, 2 months ago, the Organic Consumers Association published an article admitting that the push to enact statewide GMO labeling laws is part of a larger effort to "drive GMOs . . . off the market."

In addition to stigmatizing biotechnology, a state-by-state patchwork of mandated food labeling laws would be a logistical nightmare, creating dozens of different standards, different definitions, and different exemptions.

Some say this approach is about a "consumer right to know," but knowledge depends on consistent, accurate information, and their approach fails this basic test. Under their patchwork approach, a product may require a GMO label in one state but not another.

Even within states an attempt to mandate GMO labeling will create confusion. For example, in the State of Vermont, which has enacted a mandatory GMO labeling law, a can of vegetable soup might be labeled as GMO, but a can of vegetable beef soup with roughly the same ingredients will not because meat is exempt from the GMO label. This approach doesn't inform consumers; it creates confusion.

Inequitable attempts to mandate GMO labeling have been defeated in a number of states. However, some groups continue to ignore the science and push a state-based agenda that could put our nation's efficient food supply system at risk. This year alone, there is some form of GMO labeling legislation pending in over ½ of our state legislatures. Vermont's GMO labeling mandate is scheduled to take effect next year.

While it's a small state in terms of population, Vermont's law will have a significant impact in the region and the nation. This law alone would require dozens if not hundreds of manufacturing, transportation and logistics changes not to mention thousands of labeling changes. A single food company may be forced to change its sourcing, its storage, its manufacturing, its labeling and its transportation. The companies least capable of making these adjustments are going to be the small, independent businesses that many customers want to support.

**A National, Voluntary Non-GMO Label is the Solution**

Fortunately, Congress has the authority and the responsibility to protect the free flow of goods across state lines. Uniformity in our nation's food labeling ensures consumers have consistent, accurate information on dairy, poultry, meat and other foods. As a result, Americans can go into a grocery store anywhere in the country and be confident that their food is subject to the same standards, certifications and labels.

Under Federal preemption, Congress can create a voluntary, uniform national solution to the labeling of food products derived from ingredients using biotechnology. This approach supports efforts already underway in the marketplace, such as the USDA certified organic program. More importantly, it appropriately places trust in the intelligence of consumers to make choices best suited to their preferences.

The value to this approach is that it not only respects a consumer's right to choose, but also farmers' right to choose to use a safe, proven technology. As the Members of this Committee know, our nation's farmers are tasked with an awesome

responsibility. Not only do they provide sustenance to our nation but to countries all over the world. At the same time, they face extraordinary challenges such as fluctuating commodity prices, uncertain weather patterns, and global competition.

Given the importance of agriculture, our government has been and is focused on ways to help farmers. I know this Committee agrees with that sentiment, and is committed to doing just that. But a patchwork approach of state labeling mandates will make a farmer's job more difficult, with problems that will extend to every part of our nation's food production and distribution system.

For farmers, a GMO labeling mandate will stigmatize GMO products driving down demand for GMO crops. As a result, our farmers will have fewer choices of what to plant, will see higher costs due to crop segregation, lower yields, a decline in productivity, and an increased environmental footprint.

For suppliers, mandates mean building new supply chains—one for GM crops and a separate for non-GM crops. New supply chains mean new warehouse and storage space.

For manufacturers, mandates will require separate production runs for individual states. New labels will need to be designed to comply with each state's unique laws. Production runs will then be interrupted for labels to be changed, creating idle equipment and idle workers.

For distributors, mandates will require new delivery routes. These new routes won't be based on efficiency as they are now, but will be based on borders.

And for consumers, each of these impacts imposes new costs. In October 2013, the Washington State Academy of Sciences published a report on the cost of mandatory labeling. This unbiased, scientific analysis concluded that mandatory labeling is likely to affect trade and will impose higher costs on production. Ultimately, this cost will be passed onto consumers of GM and non-GM products alike. Further, a recent study by Cornell University found that state-based GMO labeling mandates could increase a family's annual grocery costs by up to $500.

Ensuring that farmers have a freedom of choice is not about convenience, it's about necessity.

The world's population is estimated to grow from 7.2 billion to 9.6 billion by 2050. We will need to feed more people in the next 40 years than the last 10,000 years, combined. Already, we are falling short with one in eight people on Earth not getting enough to eat.

If farmers are expected to meet the growing demand, then they must be able to utilize every tool available to them, especially biotechnology. This technology will allow us to grow more food using less land and fewer natural resources.

Stigmatizing safe, proven biotechnology through patchwork state labeling mandates or even mandatory Federal labeling jeopardizes innovation and threatens future development and use of technology in agriculture. That's dangerous for everyone.

In conclusion, I strongly urge Congress to enact a common-sense law that will provide farmers and consumers with the clarity and certainty needed for meaningful, voluntary food labeling.

Last year, our company supported the Safe and Accurate Food Labeling Act, and we understand that similar legislation will be introduced soon. Updates to the bill from last year may include the creation of a voluntary, non-GMO certification program run by the U.S. Department of Agriculture. We would support such a provision which would ensure that consumers get accurate information while preserving the choices available to shoppers and farmers.

Thank you again for the opportunity to testify before this Committee. I look forward to working with each of you this year to pass a common-sense solution that meets the demands and expectations of the American people.

I am pleased to answer any questions.

The CHAIRMAN. Thanks, Chris. I appreciate that. The chair would remind Members that they will be recognized for questioning in order of seniority for Members who were here at the start of the hearing. After that Members will be recognized in order of arrival, and I appreciate Member's understanding.

With that, I would like to yield my 5 minutes to the Subcommittee Chairman Rodney Davis. Rodney?

Mr. DAVIS. Thank you, Mr. Chairman. Obviously with a constituent in the room, I would like to start my questioning with Mr. Clarkson. Again, thank you for being here. Thank you for your testimony. In your testimony you touch on this, but do you prefer the

producers be able to voluntarily market their products as biotech, non-biotech, or both? And should either of these marketing claims be mandated?

Mr. CLARKSON. I prefer that the farmer have the choice to pick his market. I wouldn't mandate. I would do what I could to protect the integrity of his product. It gets into the issues of cross-pollination and seed purity and other issues, but it should be an entirely voluntary process.

Mr. DAVIS. Well, thank you very much for your response. In your testimony you also say everyone would win if we could lower the temperature on biotechnology. And this is a very important point that many touched on in their opening statements.

Can you expand on this, Mr. Clarkson, and as the labeling debate continues, what advice do you have in communicating with the many stakeholders that could help bridge the gap between those who support biotech and those who don't?

Mr. CLARKSON. Well, the emotion of this issue carries a lot of people away to unfortunate behaviors which my colleague on the panel was subjected to last year. The fundamental interest here is the consumer making the choice. Consumers don't choose their food entirely on safety at all. They make consumer choices on all sorts of values. I think that should be honored. It has created a market for the farmer that currently is paying him about a 15 percent premium, ten to 15 percent premium to offer non-GMO and three times as much as conventional to offer organic products in the marketplace.

If we can respect the fundamentals, the interest that seems to be driving the emotion around the marketplace is to be able to detect GMOs in at the grocery store. If we can set up a voluntary labeling program, we define it and make it standard around the United States, that gets everybody paddling the canoe in the same direction——

Mr. DAVIS. Well, thank——

Mr. CLARKSON.—while people make their choices.

Mr. DAVIS. Thank you very much for that response. Ms. Lidback, I have three school-aged children at home. There is obviously a lot of false information about the health and safety of biotech crops that is driving this debate, and we both saw that after the Subcommittee hearing last year. Can you expand on why these products are safe for your children and also mine?

Ms. LIDBACK. Thank you. Yes, food made with genetically engineered crops happen to be the most rigorously tested portion of the food that is available out there. People can rest assured, I can rest assured, you can rest assured, that they are safe. They are no more risky than other conventional non-GMO or organic counterparts.

Mr. DAVIS. Okay. Thank you. Mr. Policinski? Did I pronounce that semi-correctly?

Mr. POLICINSKI. Yes.

Mr. DAVIS. Thank you. Thank you. You run one of the largest farmer-owned companies in the country. Why has your company made investments in biotech and what does labeling mean for food and agricultural companies like yours?

Mr. POLICINSKI. Our farmers have embraced biotechnology faster than any technology in history, and they have done that because

the benefits to their economics on farm, the environment, less land and water use, less crop protection products use, and the consumers are so readily apparent. So this technology is central to the way our farmers, our farmer-owners, operate their businesses. So we have embraced that in terms of the way we manage our business. We have a business unit called Winfield Solutions that sells seed and crop protection products to farmers. We sell all types of seed and crop protection products to farmers. We sell biotechnology, biotech plants. We sell conventional seeds. So we believe in farmer choice, and it has been a good business for our farmers. It has been a good business for us, and it is good for the consumer in terms of the benefits of lower costs and a lower environmental footprint.

Mr. DAVIS. Well, thank you very much. Thank you all for your testimony. And Mr. Chairman, I have one question for the panel, but I will wait until my turn. So I will yield back.

The CHAIRMAN. The gentleman yields back. The Ranking Member is recognized for 5 minutes.

Mr. PETERSON. Thank you, Mr. Chairman. Mr. Clarkson, critics of the voluntary labeling say that it will not address the consumer demand for labeling and will create additional consumer confusion. And I frankly can't understand that. The USDA's organic program has been out there and it seems to me it has met consumer expectations. If it hasn't, how can we have a $35 billion organic market in the United States? What am I missing here?

Mr. CLARKSON. Congressman, I don't think you are missing a thing. I think you are right on the money on that. I think the organic program is certainly getting support because consumers believe in it. It is a voluntary label. I think a voluntary label would take care of the underlying consumer interest in knowing and not punish the industry and others that don't want to be involved with the cost. I don't think there would be any additional cost because the people that want that market are already labeling for that market. It is already taken into account.

Mr. PETERSON. Thank you. Mr. Policinski and Mr. Dempsey, if states like Vermont, are going off and doing their things like the mandatory labeling there, and we hope that that gets overturned in the courts, which some people are optimistic about, but if it doesn't, what is going to happen with companies such as yours that have labeling for the whole country? Are you going to create a separate label for Vermont where, if they end up with their law being upheld, are you going to run a separate run in your companies just for Vermont? Or are you going to basically say we are not going to sell in Vermont, which is what I would hope you would do.

Mr. POLICINSKI. Congressman Peterson, we haven't yet decided. I think Mr. Dempsey outlined the three choices very well. First is to stop selling to any individual state, second is to relabel our products at considerable expense, and third is to re-engineer our supply chain and reformulate our products at even greater expense. None of those are good choices. All of those choices would result in either denying consumers access to products which we wouldn't support, but they would also yield the other two choices short of not selling in any one individual state are much higher costs passed along to consumers. So I would agree with Mr. Dempsey's outline of the

three basic choices. As a company, we haven't yet decided. There are no good choices in any of those.

Let me outline as well that the idea of not selling a product in Vermont is also a very difficult choice because we would be liable for any of our products that might find their way into Vermont, and the cost of that liability is extraordinary. I think the penalty is $1,000 per item. So even if you said you wanted to pursue that first option, it is really not a viable option, which is why we so strongly support a Federal voluntary labeling law here.

Mr. DEMPSEY. I would agree. Obviously we have, as I said, companies that are multi-category, multi-billion dollar companies and small family-owned businesses. This is going to be much harder for that small family-owned business with one plant to do anything to adhere to the Vermont law as well as sell their product across other states. So those options are much more limited for the small manufacturer family-owned businesses than they would be for a multi-plant, multi-billion dollar business. So I would be repeating what we just already said to go further, but it would be a difficult decision for every company to decide what to do in Vermont.

Mr. PETERSON. I thank both of you. Dr. Federoff, am I saying that right? If a voluntary non-GMO labeling program were to move forward, can we define what a GMO is so that the consumers would understand the label?

Dr. FEDOROFF. I would hope we could do a better job because the label, genetically modified is, as several people have pointed out, misleading. We have been genetically modifying crops and animals for many thousands of years.

I think that Mr. Schmidt's suggestions are very good ones. *Biotechnology* is a little bit less of a negative buzzword.

Mr. PETERSON. Well, I don't know where the GMO came from. I guess it was Europe, and there was obviously a purpose behind it. So thank you, Mr. Chairman, I yield back.

The CHAIRMAN. The gentleman yields back. Mr. Gibbs, for 5 minutes?

Mr. GIBBS. Thank you, Mr. Chairman. It is a great panel, and I want to commend Ms. Lidback for your work and also a young couple starting in the agriculture industry, that is commendable, and you say you have two kids, 2 and 3. Really, if more kids could grow up on the farm, it would be great for our country I believe.

I want to kind of look back for a little perspective. Back in 1950, my understanding is the national corn yield was 50 bushels to the acre. In 1975, 40 years ago when I started farming, my goal was to have 100 bushels an acre. And now we are pushing 200 bushels an acre here nationally. Anything under 150 bushel would be considered a disaster. I know Land O' Lakes is shaking his head there.

And it was pointed out, this change from 1950 to 1975 where we doubled the production, I always contend it is from figuring out soil nutrient fertility, also hybrid selection, natural hybrid selection, and then I would contend from this period forward now where we have pretty much doubled the yield again, it is because we have been able to select the genetics in a faster way like Dr. Federoff says. We have been doing it for thousands of years or at least from our perspective, 100 years or so. So we have been able to identify those genes and do it exponentially in the lab. So it is really no dif-

ferent. So that is one of the reasons why the scientists say it is safe, because we know what those genes are. We can identify them. But the benefits, we are growing—we are having 14 billion bushels of corn crops a year now annually on less acres. Every year it is less acres. So it is really a food security issue. The American farmers have provided the food for this country, and we also export ⅓ of it. It is a food security yield but it is about yields. And if we didn't have what has happened in the last 25 years of this yield, we would be having food shortages. Do you agree with that, Mr. Policinski?

Mr. POLICINSKI. Yes, I do. I think there is a tremendous productivity story here. In fact *versus* 2–2½ generations ago, we are growing 6½ times more corn on 13 percent fewer acres.

We often talk about that in terms of per-bushel yield, but I will tell you, there is a tremendous sustainability story there in terms of less water and land use, less protection and crop——

Mr. GIBBS. Yes, you say that. In my 40 years now—I just figured it out. It has been 40 years since I have been farming. The crop protection, the herbicides we used back then, had residuals. They didn't break down. They weren't biodegradable. The crop protection we are using now is virtually—a lot of them don't have any residuals. I tell people that come to my farm, it is interesting. You see my neutral soybeans out there, and we have to—we do a burndown application before we plant, and then sometime in June, we come through and we apply a herbicide again, but we have to time it in such a way that it is done right before, to kill those weeds that came up, and then when the soybeans, you get this canopy to provide the shade so that new weeds won't come because there is no protection if we miss that timing.

And so we are using safer herbicides, and we are increasing the yield and also protecting the environment that way.

I would also go on to say that I agree with all of the panelists of the voluntary aspect because better than 80 percent of the grain grown in this country—was mentioned—is genetically modified in the lab. Even though it is natural selection, it was just done in a lab in my opinion. You would have to label everything if it is mandatory, genetically modified, which just scares consumers and it puts this country at a risk of food security. And it hurts the environment in the long run because we go backwards.

So I support voluntary labeling. If a producer out there can find a niche market—I am sure there is a market out there. We see it in organics, and they can demonstrate that it hasn't been modified in the lab, that they can have that market. But they can put on there that it is not—I would say artificially modified—I don't know what the term is—*versus* naturally hybrid selection like we did back in the 1960s and 1970s and the 1980s.

So I want to commend you all for your testimony. Dr. Federoff, go ahead.

Dr. FEDOROFF. What people don't realize that it is in the 20th century we used chemical mutagens and radiation to hasten the mutation process. So there isn't back then just breeding and now this artificial method. That is one point. The second point is that people have looked at the amount of genetic change that accompanies using these different techniques, and the evidence supports

the conclusion that these are the safest and least-disturbing techniques, whether you are looking at the genetics or the epigenetics. That is the kind of control level of genetic expression.

So these really are the best techniques, the least disturbing, having the lowest probability of causing a problem that we have ever developed.

Mr. GIBBS. Well, I thank you and the panelists and your good work. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you. The gentleman yields back. Mr. McGovern, for 5 minutes.

Mr. MCGOVERN. Thank you, and thank you all for your testimony. Let me begin by saying everybody is reading from the same sheet of music here, but nobody here is in favor of mandatory GMO labeling, am I correct? If we are going to have a thoughtful discussion on this, we ought to have more of a diversity of opinion at a hearing like this because it is important to hear all sides of the subject.

But let me begin by saying that I am a believer in science. I rely on the scientists to give me informed information. That is why I believe in climate change as well. That is a subject for another hearing. But the point of the matter is that there is great value in our sciences. So I am not here to demonize GMOs or the technology behind them. I don't think anybody should be fear-mongering about GMOs. I don't think anybody should be threatening anybody who wants to produce GMO crops or whatever. We ought to be able to have a more kind of a measured conversation on this.

But I do believe in transparency, and I do believe people ought to have a right to know what they want to know. The consumers ought to have the right to know what they are eating and what they are feeding their kids, and how they use that information in their food choices is up to them, not up to us, but up to them. There is great confusion with the labeling system now. I mean, I saw a poll from Consumer Union that found 60 percent of consumers believe that products that say natural means non-GMO when in fact that is not the case. More consumers think natural means non-GMO than think organic means non-GMO.

The current system, and even kind of a voluntary system is lacking. We were told that changing labels will cost food companies. Food companies change their labels all the time. It is a false argument to say that labeling requirements will drive up the cost of food. I do believe there ought to be a national standard because I do understand the patchwork of various state initiatives is not in anybody's interest.

In response to the idea that if a product said, "contains GMOs" or whatever the label would be, that somehow that would discourage people from buying those products, you have 64 country around the world already require labeling of GMO foods. Brazil, a country whose consumption patterns are similar to those in the United States, has required GMO labeling since 2001. And from what I can tell, there has been no significant change in consumption patterns.

But let me just raise one point here. I am deeply troubled by Friday's announcement from the World Health Organization's International Agency for Research on Cancer, that glyphosate, the her-

bicide most commonly used on GMO crops, is a probable human carcinogen. Now, IARC is made up of some of the most renowned scientists in the world, and if they are saying that glyphosate is a likely cause of cancer, I mean, that may be something that people want to know.

So I guess my question is, because GMO corn and soybeans, for example, are designed to withstand glyphosate, the use of that herbicide has grown dramatically in recent decades, and given Friday's announcement, I mean, don't you think people should have the right to know how their food is grown and make their own decisions? Anybody wants to——

Mr. POLICINSKI. Well, let me just respond because there are a few things that I would agree with. First, I agree there is great confusion in the marketplace right now, and state level labeling laws would increase that. I agree, and the Pompeo bill that was offered last year said we need to define *natural,* and that would be important to do. I think that a voluntary national standard would provide consumers with that choice and the information they need to make a decision. I think to do it the other way around and to mandate the label does stigmatize the ingredient and infers there is something that must be wrong with it *versus* how we have done organic in a certified USDA organic program. We didn't ask all food to be certified non-organic to be able to communicate to consumers the value of the choice to make an organic food.

There is some agreement that we do have tremendous confusion, and that is why we support very firmly a national labeling legislation that has voluntary options. I do agree that we do need to define *natural,* and that is in the proposed legislation. But I don't agree that it should be mandatory because that does stigmatize——

Mr. MCGOVERN. Does anyone want to talk about the glyphosate finding? I mean that is a legitimate scientific organization.

Dr. FEDOROFF. I am glad to address that. That is not based on any new data, and it is not the case that there have been many, many studies on glyphosate. We do have an Environmental Protection Agency, and they require considerable testing. So the organization has labeled it as——

Mr. MCGOVERN. Probable.

Dr. FEDOROFF. Possible carcinogen doesn't mean anything has changed or any new data has been produced.

Mr. MCGOVERN. But I guess the point is, shouldn't consumers have a right to be able to know that? I mean, that is the——

Dr. FEDOROFF. If there is evidence that it is a carcinogen, yes. I think that is correct. But there have been so many studies over the years on this particular compound that have failed to identify any carcinogenic potential that for one group to say, "Oh, well, it just might be, then do we put that on a label?" I mean, this doesn't make any sense.

The CHAIRMAN. The gentleman's time has expired. Mr. Gibson, for 5 minutes.

Mr. GIBSON. Well, thank you, Mr. Chairman. I appreciate the hearing, and thank you to the panelists, too, for being here today.

I believe that people have a right to know what it is that they are consuming, and I also feel very strongly about science and recognize the fact that we have avoided famine, because as was men-

tioned, we have modified over the years. So I recognize that as well.

I represent 11 counties in Upstate New York. I am a fervent and a strident advocate for my farmers. Ensuring the viability of our family farms is critical, a principle that we can't drop as we move forward reconciling right-to-know and science. And so I thank Ms. Lidback for being here today, and thank you for your testimony.

I also have tremendous faith in the American people that empowered with information—I guess I don't agree with some of the assessments that they would change their consumption habits. I think that they will make good choices. And so I just want to put that on the record, too. As it relates to right-to-know, if we thought about it more broadly, we get fixated on labels immediately. I would be interested in the panel's response to the possibility of right-to-know with an approach that provided details on modification on a website where individuals could go to get information. I would be curious to know what their reaction would be to that technique.

Mr. POLICINSKI. Congressman, I would like to respond to your question because there is a desire in the industry to engage with consumers around this great dialogue where their food comes from. But we want to do it in a science- and fact-based way. This actually is part of that, having an orderly Federal law that is voluntary around labeling GMO products, would create an environment that we can engage with consumers in a constructive way. There are a number of things that are going on in a variety of industry association, two that I am part of, the National Council of Farmer Cooperatives and the Grocery Manufacturers Association. Everything from facts up, from to a discussion of how we can do exactly what you have described, to engage consumers in a dialogue, which is bigger than a package panel, regarding where their food comes from and help them understand that there are a lot of modern business practices that give us the safest, lowest-cost, most-abundant food supply in our history.

So that is under way, and this is part of that process, to create an orderly environment to engage consumers in that discussion.

Mr. CLARKSON. Congressman, when we receive an order from a Japanese food company, it often comes with a list of 100+ chemical residues that we are supposed to test for. Realistically, it would cost about $16,000 to $20,000 to test grain going into a container, which is more than the grain than the container would be. But that is because they are concerned about residues. I fully expect we will be asked to certify that we are delivering products that didn't have Round-Up in it, glyphosate in it, within a matter of days. Everybody supports science-based, but science doesn't speak with a single voice, and that confuses people. It is beyond my capability to know which scientific argument is right. So I prefer to make the distinction, if enough people have asked for it, and let them decide going to the Internet and gathering what information from whatever source and making their consumer decision.

Ultimately, the market will decide. The market has decided right now to pay a farmer $3.80 in Illinois for conventional corn, about $4.20 for non-GMO, and about $12.50 for organic. So the market is speaking with its dollars and asking people to perform. I think

labels help in the grocery store, and science is an excellent foundation, the only foundation, but just what does science say is confusing.

Ms. LIDBACK. I would like to chime in. Congressman, I walked away from the Subcommittee hearing last year feeling like absolutely consumers have a right to know. No one here is contesting that statement. And in fact, since then, more and more resources have popped up just exactly the way you have described them, websites with good information, including one from my alma mater, Cornell University has a great website, the Alliance for Science, that explains a bit more in detail some of these growing processes and what the details are that lead to farmers making the choices to use the biotechnology that they do in their everyday practices.

Dr. FEDOROFF. Maybe I would just like to make a point that addresses Mr. Clarkson's comment about how do we decide. In science we have a concept called the weight of the evidence. If you have two studies and one says something is dangerous and one says it is not, you don't know what to decide. If ten studies say it is not dangerous and one study says it does, you have a pretty good chance of believing that one. If 100 studies or 1,000 studies say it is not dangerous and one still keeps saying it is dangerous, you are very comfortable going with the weight of the evidence, which is on safety.

Now, in this particular area of GMO, one study often gets disproportionate attention. There is a famous study by a man by the name of Seralini who claimed that glyphosate caused tumors in rats. The study was retracted. The data were terrible, but that dominates people's thinking. Should we bow to that or should we go with the weight of the evidence?

Mr. GIBSON. I know my time is expired, Mr. Chairman. I want to make one final comment and that is that arming people with the information is really what we are talking about here. My family——

The CHAIRMAN. The gentleman's time has expired. Really, we have other folks, Chris.

Mr. GIBSON. You bet.

The CHAIRMAN. So Mrs. Kirkpatrick for 5 minutes?

Mrs. KIRKPATRICK. Thank you, Mr. Chairman, and I have for the record a report that I would like to enter from Cardinal Peter Turkson, President of the Pontifical Council for Justice and Peace.

The CHAIRMAN. Without objection.

[The document referred to is located on p. 79.]

Mrs. KIRKPATRICK. I want to read a portion of that, and then I will ask my question. He says, "hunger in the world is a very serious injustice that shows fundamental disrespect for human dignity. Pope John Paul II called it the first and fundamental form of poverty. Persistent hunger, starvation, and malnutrition represent a global failure of humanity that, to our shame, has dragged on for decades. It is a plague and a long-term indicator of a system that does not function properly. Some point to the economic crisis of recent years as the reason why the world cannot do better, but that is just an excuse. Food insecurity has persisted for decades through prosperous times as well as more difficult times."

And the panel, I want to explain to you. I represent the Navajo Nation in Arizona where household food insecurity is above 75 percent. And so my question is, do you think it is possible to feed a world population of over nine billion people without the use of genetic engineering and the full use of agricultural technology? And I will just open that up to the panel, whoever wants to address that.

Mr. POLICINSKI. I would be glad to offer my perspective which is based on a few things, but I do agree that we have talked about this biotechnology and biotech traits in large part in farmer terms, yield per acre. We haven't done enough of a discussion around the benefits to the environment, less land, less water use, less crop inputs, more benign crop inputs.

We haven't talked enough about it in terms of cost and the benefits to consumers, in terms of lower-cost foods, because we get a crop—just a couple of years ago we had the drought. We got a crop. The weather patterns were not that dissimilar from the late 1980s when we didn't get a crop. So we don't talk enough about the benefits beyond yield per acre.

I think you raised another benefit and that is the ability to feed the soon-to-be nine to ten billion people on the planet in an increasingly productive and sustainable way and adapt to climate change along the way. I do not think we can feed that nine to ten billion people that are soon to be on the planet without chewing up a lot of natural resources without biotechnology.

Mrs. KIRKPATRICK. Anyone else on the panel want to comment?

Ms. LIDBACK. I would, Congresswoman. I appreciate your sentiment. And just for example in our country alone, you must be aware, that less than two percent of our population lives on farms. So in my opinion, we are going to need every farmer that we can get, organic, non-GMO, conventional, whatever it takes, and certainly biotechnology offers a tremendous amount of tools beyond genetic engineering in order for us to do the best that we can.

Mrs. KIRKPATRICK. Anyone else?

Dr. FEDOROFF. Yes, I would like to address it. Today we produce enough calories to feed everyone in the world a reasonable number, and it is a matter of unequal distribution of resources. Today if you have the money, you can buy food. We are looking at a future where we do not know what the impact of climate change will be. It is already negatively impacting our productivity worldwide.

There are still places in the world that productivity can be increased by conventional methods, but in the end, if we want to reduce the footprint of agriculture even further—and conventional breeding and mutagenic breeding has done a phenomenal job of reducing the required acreage to grow a certain amount of food. In the future, the real barrier is the ability of plants to collect sunlight and drive, to convert—it uses sunlight to convert air and water into foodstuffs. In the next breakthrough, the next big breakthrough has to be in the efficiency of photosynthesis. We can't do that by conventional techniques. We will have to understand, we will have to use all of the science tools that we have including genetic modification of plants to make the next big breakthrough that will allow us to reduce the footprint, make agriculture more sustainable, and yet continue to increase the food supply.

Mrs. KIRKPATRICK. Thank you very much. I appreciate the testimony that you are giving us today, and I yield back.

The CHAIRMAN. I thank the gentlelady. Mr. Benishek, for 5 minutes.

Mr. BENISHEK. Thank you, Mr. Chairman. Thanks to the panel for being here today. Dr. Federoff, are the changes that have been made in the lab, treatment of plants, changed their properties any different than the way we have been doing it for thousands of years?

Dr. FEDOROFF. Yes. They are very much more precise because in the last half-century, we have learned more about what genes are, what they do, what they do in a different context than we ever knew before. So in a way, we were stumbling blind. We used chemicals and radiation kind of as a shotgun. Now we can take just one gene, we know what it does, or half-a-dozen genes. It doesn't matter. But it is a small number of very well-defined genes that will confer new properties on plants and animals. This is something we never could do before.

Now, does that mean that we will never create a plant or an animal that is substantially different from what was before? No. So regulation really needs to be based on the properties of the organism, the environment it is going into, and what is being added. And all of that, I have to—I can't resist pointing out that that is exactly what the National Academy of Sciences recommended in 1987.

Mr. BENISHEK. Well, thank you. I appreciate that. Going back, you are exempt from the rules apparently in Vermont, is that correct?

Ms. LIDBACK. Currently, yes.

Mr. BENISHEK. So if you had to comply with those rules, would you be able to keep farming?

Ms. LIDBACK. That is an interesting question. It sort of depends on what kind of a price we would then be able to receive. So for example, generally speaking, when you convert to the organic, you also are then able to collect an organic premium in the market. So probably initially no, but if the change were to happen overnight, the increasing costs I detailed in my earlier statement would put us right out of business.

Mr. BENISHEK. I guess I don't understand. There is labeling requirements in the State of Vermont except that the Vermont producers don't have to—is there only certain producers don't have to comply or is it all Vermont producers?

Ms. LIDBACK. It is by industry, and it is really about the food product itself. So the dairy and meat would be exempt as well as food sold in restaurants would be exempt from being labeled, whether it was produced using genetically engineered ingredients or not.

Mr. BENISHEK. Let me ask a question, this time of the panel perhaps. Does anyone disagree that a voluntary labeling Federal rule, would that not give the consumers all the information they need to know? I don't understand any reasoning against that. Mr. Dempsey?

Mr. DEMPSEY. We do think that is exactly the case. I mean, we have a template for that. The organic labeling has given the con-

sumer who wants that product all the information they have needed. As somebody said earlier, we don't force companies to form labels that say non-organic. So that doesn't make much sense along that pattern that we would change anything different for GMO-free labeling.

The information is there on a voluntary basis. If somebody wants it, they seek it out and purchase that product.

Mr. BENISHEK. Right. Right. Anybody else have a different opinion?

Dr. FEDOROFF. My view is that if more information were provided, if the law stipulated that you had to put together a lot more information to offer the consumer, then it would depend on who was doing it, how it was done, how accurate it was, and so forth.

Mr. BENISHEK. All right. Thank you.

Mr. POLICINSKI. No, I would agree, just something to add to Mr. Dempsey's statements, that I would agree. We support the Federal voluntary labeling program. I think it does allow us to provide consumers a choice, but importantly it allows us to continue to engage with consumers in a dialogue regarding where their food comes from, which is important. I just don't think the front of the label is where it should be. And as I said earlier, there are a number of efforts going on in the industry, in individual companies and within industry associations to further that desire to engage with consumers around where their food comes from in the modern business practices that give us this great lowest-cost, most-abundant, safest food supply that we have had in our history.

Mr. BENISHEK. Thank you. I am out of time it seems.

The CHAIRMAN. The gentleman's time has expired. Mr. Aguilar, for 5 minutes.

Mr. AGUILAR. Thank you, Mr. Chairman. Ms. Lidback, in your testimony you mentioned that the marketplace is already sorting out some of the non-GMO labeling without legislative mandates. I wanted to just get your feeling and your perception and that of your peers I suppose on the Whole Foods discussion, that in 2018 they plan to have all their products in the United States and in Canada labeled.

Can you give the Committee your views on these kind of private-sector driven initiatives?

Ms. LIDBACK. Thanks for your question. Yes, it is a topic of—oftentimes we talk about it a lot, my peers and I. And one of the frustrations we have is sort of this clash between providing factual information and wanting to market a product. It was Mr. McGovern earlier that talked about transparency and consumers wanting transparency when there are a lot of different conflicting ideas and statements out there.

For example, a great example is in chicken. I just learned you are not allowed to label chicken packages as antibiotic-free. You can use the terms grown without the use of antibiotics, but you can't label it antibiotic-free. And there are various restaurants in the country that will have on their menus antibiotic-free chicken. So in my opinion, that is misleading. That is misleading the consumer. So the Whole Foods effort to sort of have a labeling initiative, I don't necessarily agree with it. They are listening to their customers, certainly, and they are trying to provide what they

want, but at the same time, are they stigmatizing genetically engineered foods? And that is what the debate surrounds.

Mr. AGUILAR. Thank you. I appreciate the answer.

Dr. FEDOROFF. Let me just add to that that many of the products—since I know what GMOs are on the market and what are not, many of the products that they are attaching that label to today are not genetically engineered, never have been. Okay? So it is basically deceptive marketing.

Mr. AGUILAR. Thank you. Mr. Policinski and maybe Mr. Clarkson can also handle this next one. Sir, you mentioned earlier that there are some industry components. What I heard you say was there are some industry components within possible legislation that you could support, such as the definition of *natural,* you mentioned, in addition to the voluntary labeling that we have heard extensively. What are some other policy components that you feel industry can get behind showing consumers as you mentioned more about where their food comes from?

Mr. POLICINSKI. Well, I don't know if it is policy or not. I think policy that we have had in this country and our regulatory agencies have been very fact- and science-based, and that needs to be continued. We need to be very fact- and science-based in the policies that do come out and the regulations that do come out from our regulatory bodies. And I would say that needs to be continued, and in large part, that is what we are talking about today.

Other engagement that is going on is voluntary and by individual companies, and what I am describing and to some degree even your question about Whole Foods is individual companies can choose to market how they choose to market, and consumers could choose to make their own decisions based on that. I do think that we are seeing very healthy outgrowth of this conversation and others. Consumers are more interested in where their food is coming from, and we will see more, I know we will see more, organizations on a voluntary basis provide that information on websites and through a variety of means.

So I don't think that is a matter of policy. I think that is the individual companies trying to be very transparent with their consumers.

Mr. AGUILAR. Sure, but one of the panelists just said that it was deceptive. So you are saying that we might gravitate toward that, but one of the panelists just mentioned that those efforts were deceptive.

Mr. POLICINSKI. Yes. Well, let me be clear. I am not for deceptive marketing in any way.

Mr. AGUILAR. Right.

Mr. POLICINSKI. The record will reflect that, right. And nor am I accusing anybody of that. I think the notion is just increased transparency of where your food comes from. There are a lot of modern business practices that contribute to, as I have said before and we need to keep saying it, the safest, lowest-cost, most-abundant food supply in our history and arguably in the world.

Biotechnology is just one of those modern business practices that yields that statement. There are other practices such as advanced breeding on dairy farms that lead to very efficient dairy cows that

produce milk more—there are a lot of practices that we need to talk more about.

Mr. AGUILAR. Mr. Clarkson, do you want the last comment?

Mr. CLARKSON. Yes, Congressman Aguilar, one of the key policy issues is to define what we mean by the term. When we end up with multiple definitions, the market is in great confusion that causes trouble for all the players.

So the other thing is in respecting the choice of one farmer to do something and farmers who are neighbors need to work together. And it would be nice to have some policies that would encourage that.

Mr. AGUILAR. Thank you so much. Thank you for your answers. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Allen from Georgia.

Mr. ALLEN. Thank you, Mr. Chairman, and once again, I appreciate the panel here and basically the comments that you have had about this particular issue. One of the things, Dr. Federoff, that I have been sitting here thinking about is as far as the testing of these products. Are there any risks for consumers to choose organic foods?

Dr. FEDOROFF. Are there risks?

Mr. ALLEN. Yes.

Dr. FEDOROFF. To choose organic?

Mr. ALLEN. Yes.

Dr. FEDOROFF. Indeed. We share our pathogens with animals, and the primary tenant of organic farming is a prohibition on synthetic nitrogen fertilizers. They use green manure or cow manure or other manures.

Mr. ALLEN. Right. Okay.

Dr. FEDOROFF. Okay? And as I said, we share our pathogens with animals. And a number of the food poisoning incidents are coming out of organic farming. The outbreak that killed some 50 people in Europe a couple of years ago was traced to organic beansprouts.

Mr. ALLEN. Okay.

Dr. FEDOROFF. And this is something that people are just simply not aware of.

Mr. ALLEN. And that is what——

Dr. FEDOROFF. Now, properly treated manure is safe, but there is always that probability because there is no uniformity to that treatment.

Mr. ALLEN. Ms. Lidback, I grew up on a dairy farm, and the best decision that my dad made was to get out of that business. And here you are, first-generation. I applaud you. I chose to be the clean-up person because I got to sleep a little later. And speaking of cow manure, I am in trouble there because that is what I did, is clean that place up every morning, every night. But I can tell you this, if they get too tough on you there in Vermont, you are welcome to come to the State of Georgia and we will do everything we can to help you do business down there.

Ms. LIDBACK. Thank you.

Mr. ALLEN. Yes, I will take any other comments. What we want is a solution to this and what is the Federal Government's role in

this. We have less than about 2½ minutes, and I would like to open it up. What do we need to do on this?

Mr. DEMPSEY. Just one comment that Congressman Aguilar made that is important and is kind of overlooked in this Committee or even on the whole discussion and that is defining the term *natural.* Many of my member companies are in numerous litigation between the different perceptions of what is natural and what isn't natural, and the part of the bill, my understanding is, that it mandates a Federal definition of *natural.* And certainly that is something that we would advocate very strongly that has to done.

Dr. FEDOROFF. And of course, corn would be totally unnatural by any definition because we created it.

Mr. ALLEN. Right.

Mr. POLICINSKI. Congressman, not to be redundant, but I want to come back to the Pompeo-Butterfield bill that was offered before that by establishing a national voluntary standard does clear up confusion. It does provide consumer choice in the same manner that organic, USDA-certified organic does, and it does preserve farmer choice. It allows the marketplace to determine then the size of those businesses and the size of the use of that technology. There is a simple solution.

Mr. ALLEN. Okay.

Mr. SCHMIDT. If I could also add, too, in terms of my testimony and my history, earlier in my career I worked for the USDA Food Safety and Inspection Service and worked with many talented regulators, with the career staff, also at the Food and Drug Administration, and we have had a lot of discussion about who knows? Who do we trust? I mean, these are the people that tax dollars go to determine what is important health, nutrition, and safety information? They, as many have testified, can regulate within the current needs, and there can be more legislation. But in the meantime, those are the folks who make those important decisions. Otherwise, there is chaos out there if we let everybody make those delineations.

Mr. ALLEN. Well, that is why I asked the question about organic side. It seems like the GMO is kind of on everybody's radar. So let us let everybody know what is going on because the consumer does need to know and the consumer needs to have the ability to make that choice. Thank you very much, and I yield back the remainder of my time.

The CHAIRMAN. The gentleman yields back. Mr. Scott, for 5 minutes.

Mr. DAVID SCOTT of Georgia. Thank you, Mr. Chairman. This has been a fascinating hearing. I think basically what this boils down is do we have—because all of the consumers need to know what is in the food. It is basically whether it is one national standard or state by state. But there is another issue here that purveys, that runs from the farmer, the producer, all the way up to the consumer, and that is economics. Mr. Dempsey, you hit two very important points that we need to pay a little attention to.

You mentioned in your statement that, first, ½ of your businesses in your association earn less than $½ million a year, or should I say it was $100 million gross. And second, which means they are basically small businesses. And the other point was that

in some of these communities, that particular business is the primary source of employment.

We ought to look at these two and how they basically impact. So tell us just how critical is the need for the Federal Government to intervene here with a national standard, rather than as it seems to be a state-by-state approach? What is that economic impact on the jobs and on small businesses?

Mr. DEMPSEY. Thank you, Congressman. As I said, most of our businesses are smaller, family-owned businesses, second-, third-, fourth-generation. The snack industry is a very regional, localized business. So you have a lot of small manufacturers who are employing, the main employers, and the manufacturing process in their areas.

To be able to basically navigate a list of state laws would take additional people, additional costs, or painful decisions to exit a certain market. And in many cases, those markets are the markets on the border that they would have a hard time complying with state-by-state laws, especially if those laws have different nuances and different regulations.

So the hard decisions are you sell or you stop manufacturing and walk away.

Mr. DAVID SCOTT of Georgia. Okay. So the impact would be considerable?

Mr. DEMPSEY. The impact would be considerable both in more warehouse space, more SKUs, more film, a greater distribution burden based upon more SKUs on a truck. It would be significant, yes.

Mr. DAVID SCOTT of Georgia. All right. And Mr. Policinski.

Mr. POLICINSKI. Yes.

Mr. DAVID SCOTT of Georgia. Policinski.

Mr. POLICINSKI. Perfect.

Mr. DAVID SCOTT of Georgia. Wonderful. Tell me, we haven't discussed much, but tell me about science-based? What exactly is science-based voluntary labeling and just how critical is a voluntary label to your business?

Mr. POLICINSKI. Yes. First, science-based: Dr. Federoff did a good job talking about science-based decisions and how they are made. I think that as it relates to this topic of biotechnology and biotech traits, clearly the weight of the sciences, that the technology is safe. And that has been reinforced by a variety of agencies over 20 years, thousands of studies. So that is the first point. And our company is very interested in that as is the entire food industry.

Second, the voluntary national labeling standard in the Pompeo-Butterfield bill just makes order out of a potentially chaotic situation of state-by-state labeling. That is, as you have heard from Mr. Dempsey, a situation that is not just another label. It is often characterized as that. And we do have products on the marketplace that are modified at the end of the system, for a new flavor, for example. But this change would extend all the way back through the food supply chain, right to the farm, the seeds that are chosen, the inventory of the seeds that are carried, the segregation of the crop, the transportation and distribution of a separate crop, the storage of those raw materials that are factories in separate facilities or storage areas, and then the segregation of the manufac-

turing process where we would have to run one technology and then clean the lines and then run another technology. I haven't yet gotten to the forward segregation of the supply chain when we ship and distribute goods to the grocery store, which again, would require segregation.

So the reason we are so supportive of a voluntary national labeling standard, the Pompeo-Butterfield bill that was offered last year, is it makes order out of that potential chaos or complexity and saves cost.

Mr. DAVID SCOTT of Georgia. Thank you, sir. Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman yields back. Mr. Bost, for 5 minutes.

Mr. BOST. Thank you, Mr. Chairman. First off, we probably went down this earlier, but I have been bouncing in and out of the room. Mr. Policinski, I would like to know if I can what your company is already—because Vermont has already passed a law. Are you preparing already and whether those costs that you are seeing and everything for one state and how you are going to handle it. Because I know we have talked about three different options that could be available. And where are you going with that at this time?

Mr. POLICINSKI. Congressman, we did talk about this and the bottom line is we have not decided. There are no good choices. The three choices that are often mentioned are don't ship to that state. Well, let me remind you that it is Vermont right now, but there are 26 states with pending legislation

Mr. BOST. That is pending, yes.

Mr. POLICINSKI. Second, labeling or segregation, the second and third choices, are difficult and costly as I just tried to explain. I also want to outline, and you may have been out of the room when we talked about this, that the idea of not shipping to a state like Vermont is really a non-starter in my opinion because of the legal liability. Let us say that was a choice we made, which I am not advocating that. We would still be held accountable for the fact that any of the products we might ship to neighboring states would show up in Vermont, and the penalty there is substantial. I believe the Vermont legislation has a penalty of $1,000 per day per SKU. That is a very substantial penalty. And by the way, that is enforced by the Vermont Attorney General's Office, not the usual regulatory bodies that we work with because it is a violation of their law.

So this is a very onerous situation. In all these paths, there are no good decisions there. They are all higher-cost decisions.

Mr. BOST. Mr. Dempsey, did you want to——

Mr. DEMPSEY. Let me just add that supermarkets are national in scope as well. So the decision not to sell in Vermont is more complicated by how you bring your product to market, whether it is DSD, direct store delivery, or through warehouse distribution.

If you are shipping product into an Ahold store in Massachusetts, the Stop and Shop, the chances of that product being sent erroneously to Vermont are magnified many times so that you have supermarkets that are operating in four or five or six different states but the burden, at least in Vermont's law, is on the manufacturer to make sure that your product is not on those shelves.

It really becomes a liability to the manufacturer to even ship to a grocery store who is doing business in many states. So there are a whole bunch of repercussions that come out of that system.

Mr. BOST. Just to continue and maybe even a statement as I am continuing questions, as we deal with GMOs, okay, in our own family, we have had to deal with gluten-free. My wife is gluten-free. Companies automatically, voluntarily, mark their products as gluten-free to encourage the sales of those to those who are. What would be the difference here in this, proposing that it would be voluntary?

Mr. DEMPSEY. A broader statement is that companies make products to sell them, and whatever they can do to sell them, to entice the consumer to purchase them, they are going to do, whether it is to go for organic certification or whether it is to go for GMO-free or to manufacture products that are gluten-free. That information for that segment of the market is available from a marketing perspective of those companies. I see no difference between that and labeling everything else that this does contain gluten which is already in the nutritional——

Mr. BOST. That is right. Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. Thank you. The gentleman yields back. Mr. Walz, for 5 minutes?

Mr. WALZ. Thank you, Mr. Chairman, and thank you all for your testimony. I think it is appropriate we are here. Tomorrow, March 25, would have been the 101st birthday of Minnesota graduate and researcher, Norman Borlaug, so the discussion we are having falls directly into that. And I am appreciative of all of your time and effort.

I would point out, and we are trying to get to the heart of this, our responsibility in Congress and our responsibility I would argue each of you is to define a problem, gather the information, and then make correct assumptions to that, and that is what we are trying to get at.

January 2015 Pew Research Center study came out and showed that 89 percent of scientists believe that GMOs are safe, that 37 percent of the public did. And I am going to come back to this. Yes, it is the 800 pound gorilla in the room, but the science and the preponderance of the evidence on this seems to warrant where we are headed. And we can get into this issue with Norman Borlaug's position, with 12 billion people on the horizon for 2100, with the idea of how we are going to feed these people, but the problem we have in this place is you can't be selective when the preponderance of the evidence shows something. And we do that. And there better be some soul searching on both sides of the aisle on this, as to let the science and the research drive us to come up with conclusions that work. And it is important, both for consumer safety and sense of fairness.

The point was brought up, Mr. Clarkson's point about ratcheting down the rhetoric is exactly it. But while I would make the argument, and I respectfully say, that the Chairman will run his Committee as he wants to. The questions that Mr. McGovern brought up, there should be some dissenting voices here or we end up in the situation like the outlandish situation in Florida where state officials can't talk about climate change. Well, you give a percep-

tion that there is something you don't want people to talk about. The evidence is clearly here that this is a way to feed people. It always has been. It is as much about Mesopotamia as it is about Monsanto, and that is the discussion that we have to have and have fairly so that we can make good decisions.

And I am just troubled that we will go down a road. And there are some interesting things. Dr. Federoff, you brought up a good point. This one has always gotten me a little bit. Orange juice, for example, the Florida citrus folks, and they want to sell them. They label no GMOs on there. There are no GMO oranges. But here is the thing. There may need to be soon with the greening, the citrus greening disease, that is coming. So they may regret that decision that we are going to end up with those eventually, because of this new entrance into the environment.

So I applaud all of you for being here. I would ask my colleagues, this gives us an opportunity to reset on some of these things. You can't say, wow. The preponderance of the evidence and the scientific consensus is nearly whole on this issue and then walk to another committee room and have the exact same folks. Now, I get it. There is 11 percent of scientists here. I bet you they are not egronimous that are part of that. And to bring in someone else in an unrelated field and use that, that is the outlier that Dr. Federoff said, and we are going to base our decisions on that. Because I would make this argument here as feeding the world's population, continuing to advance, continuing to do. The things you do is feed, clothe, and power the world, is going to involve a simultaneous discussion on climate change as it deals also with GMOs. And I wish we would have the maturity, the ability to be able to do what you all have clearly laid out today.

And Ms. Lidback, I apologize for those people who would question you because you have the audacity to talk about the science. Trust me, it happens on other issues, too, unfortunately. But your willingness to come here and speak about this and talk about it, and the powerful thing here, too, just hearing this, the organic folks can make three times more. Well, good for them if they are going to be able to. And that is where we are at. We are not trying to stop that.

But it is an important point and an important discussion that we cannot drive policy, whether it is on labeling or how we go about things that is not based on the evidence, that is not based on research, because that will lead to bad outcomes all the way around.

So I want to thank each of you for being here. I want to ask my colleagues to have the courage to discuss these things as they are and then to come up with good solutions. And that shouldn't be all that difficult. The good news here is that our producers continue to be the most productive in the world. Our researchers continue to be the most innovative, and we are able to provide the most abundant, safest, affordable food supply in the world, and we can do that around the world. So this is an important discussion. It is broad, it is important, and I applaud each of you for continuing to bring it to the forefront and hopefully we will get a good solution for you and for the consumers. Thank you.

The CHAIRMAN. The gentleman yields back. Mr. Emmer, for 5 minutes?

Mr. EMMER. Thank you, Mr. Chairman. And first to the panel, thank you for being here. And I apologize. I had to step out and come back. This is quite an operation in this place. You have several meetings all at the same time in different buildings, and there must be a better way to run the train station.

Be that as it may, I respect your time. Listening to my colleague from Minnesota talk about there should be dissenting voices in the room, most of us would agree that if the world would just agree with our position, it would be a much better place to live in. But that doesn't happen. And somebody can correct me, but it was Bobby Kennedy that said something to the effect that if you can get the American public, 80 percent of the American public to agree on anything, that should be considered unanimous. And in this case, when you have 90 percent of the science out there agreeing, that is pretty close to being unanimous.

I want to go at this very quickly from a different—again, forgive me if somebody has already done this. I wasn't here. So please be patient with me. I want to go at it from the specific costs and break it down by level.

Mrs. Lidback, you are running a dairy operation. You have costs that are going to be added on for—you talked about the inputs when I was here earlier. You were talking about the cost of feed. Aren't there other costs in terms of having to manage and record, get inspections, certification. Have you talked about those already today?

Ms. LIDBACK. No. So beyond the feed, I mean, to keep milk segregated from cows fed non-GMO feed *versus* feed with GM, you would have to put in a second bulk tank and you have to put in a second grain bin. And so you are talking about capital expenditures, and as you can imagine, on a 50 cow dairy, there is really not a whole lot of extra left to go around to sort of fulfill those needs so that kind of consideration might be a deal-breaker for us.

Mr. EMMER. Wow, and I was just thinking, labor. You and your husband are going to have to have some more kids in order to do this thing.

Mr. Dempsey and anybody else, I want to go to the next level because we have the processors, those that have to put these products out. You talked about two lines, but it is much greater than that, isn't it? Aren't you going to have to hire all kinds of new staff to keep track of all these things? And then there are storage costs?

Mr. DEMPSEY. Yes. The answer is the two lines refer to just having one state that mandated the labeling and everybody else who didn't. So there is significant input, depending on the number of states who have different regulations. But yes, all up and down the line as we talked, our grain is kept in masa, it is kept in separate silos. You have to have separate silos for that. The distribution changes would be significant because you have to keep track of various different strains of products going to different states, the same product but labeled differently. So the multipliers in cost come up with how many different labels you have to keep and how many different infrastructure you need to build to hold those.

Mr. EMMER. Very quickly because this just adds, it compounds, as you go each level. And it wouldn't be fair if I didn't go to the Minnesota guy with the time that I have left.

Mr. Policinski, farmers are interested in operating a business, raising their families. They want to produce quality product that can be sold the world over. I imagine in the farmers that I know, they don't much care for the litigation system if they can stay away from it. What are the concerns and the costs that could be put into this at every level when you talk about the legal ramifications? Aren't those just as big?

Mr. POLICINSKI. Yes. First, farmers are pretty savvy businessmen, and they have adopted this technology at record pace. Of all the technologies over all the years, this has been the one that has been adopted by farmers the most quickly and it is because they see the benefits so clearly to their operations, to the environment, less land and water, and to cost, to consumers. I think farmers have voted.

What we are trying to do here in the discussion is preserve their choice of how they want to farm as well as provide consumer choice. And again, the Pompeo-Butterfield legislation that was proposed clearly affords that opportunity through developing a national standard——

Mr. EMMER. Right.

Mr. POLICINSKI.—and a voluntary national standard. I think your comment on legal costs would pass through the system to ownership, and in our instance, we are a farmer-owned company.

Mr. EMMER. Right.

Mr. POLICINSKI. We did have a discussion a couple of times now on how onerous it is to have a state law or a series of state laws, and if you chose not to serve those areas, the implications of legal liability would be very onerous.

Ms. LIDBACK. Can——

Mr. EMMER. And at the end of the day, it all gets passed onto the consumer. I am sorry, Ms.—

Ms. LIDBACK. No, it is okay. I just wanted to add, Mr. Emmer, when I was trying to locate a non-GMO source for grain, I first of course started my own grain company, and they simply don't have the capacity either. They are already satisfying an organic grain distribution system as well as conventional. So they don't have the capacity for a non-GMO option, either

Mr. EMMER. And again. Thank you all. My time has expired. Mr. Chairman and to the Ranking Member, thank you for having this hearing because it seems like everybody here is interested in a win/win for everybody.

The CHAIRMAN. Thank you. The gentleman's time has expired. Mr. Costa, 5 minutes?

Mr. COSTA. Thank you very much, Mr. Chairman. I think this is not only a critical issue here in our country but also as it relates to the labeling issues, a critical issue as we negotiate these trade agreements, both with the European allies and as well as in Asia.

I, Mr. Schmidt, was interested in your comments earlier on in terms of the polling sampling that you have taken and undergone, and what it really made me think about—and Dr., is it——

Dr. FEDOROFF. Federoff.

Mr. COSTA. Dr. Federoff, is our lack of consumer education related to risk assessment or risk management? If it were not for all of the technology that we have employed post-World War II with

regards to food and food safety, we would not have the longevity or the healthy lifestyle that we enjoy today. While we have problems with obesity and other things, it is more related to choices people make, as opposed to the quality of the food that we have.

How can we do a better job in educating folks about the better level of quality and the technologies that have been employed to make foods healthier and safer today?

Mr. SCHMIDT. Well, thank you. I think you have identified some of the things that have come forward today, that this is not a science debate or a safety debate. It has come down to a communications debate. And sometimes as you indicated, people are faced with fear and risk, and it has almost become a cult following among some to oppose this technology without any demonstration of actual harm or safety risks.

And so there needs to be even more leadership, whether it is Congress and the Administration, the industry, or academia to speak up, to have the bravery like Ms. Lidback to be steadfast with the facts, and there is strength in numbers. So the more people——

Mr. COSTA. A lot of the food processors and other companies and agricultural associations have tried to do education. I don't think it has been well-coordinated. But we do see that on occasion.

When you talked about 97 percent of the scientists, Dr. Federoff, were you talking about the safety of genetically modified foods? The general perception is obviously not at that level in terms of safety?

Dr. FEDOROFF. Indeed. This is the pith hole that needs to be addressed by scientists across the board. That includes physicists and psychologists and economists and so forth. If you polled the claims of biologists who have used these techniques, you will be closer to 100 percent.

But that is not the issue. I think as Mr. Schmidt identified, it is more about communication. And the problem is that our current system which has very big regulatory costs to get a GM product to market prevents academic scientists, scientists in public research institutions, from getting genetically modified——

Mr. COSTA. This is a real challenge.

Dr. FEDOROFF.—for example. Right.

Mr. COSTA. Especially in Europe right now.

Dr. FEDOROFF. You bet.

Mr. COSTA. We have a process for it. We have only been able to register a limited amount, and it is a lengthy and cumbersome process.

Dr. FEDOROFF. Correct.

Mr. COSTA. Trying to get agreement on the best science is always a challenge, and in some cases, let us be frank, it is used for basically leverage purposes as it relates to trade.

Dr. FEDOROFF. Absolutely. But let us just talk about here in the United States. If we could manage to make the process less onerous based on the accumulation of almost 40 years of research now, it would be possible to vet genetically modified fruits and vegetables. So a colleague of mine in England has developed a beautiful wine red tomato which is better for you because it has the same kinds of compounds in it that you have in blackberries and blueberries which are good for you. When people——

Mr. COSTA. My time is almost up.

Dr. FEDOROFF. Okay. So familiarity, we don't have those——

Mr. COSTA. No, I know.

Dr. FEDOROFF.—products in the market.

Mr. COSTA. Ms. Lidback, as a person who grew up on a Portuguese dairy farm, I want to commend you for your efforts and encourage you to stay with it. I, too, know what to do with, the word *manure.* I grew up in that same setting as you and your family. I want to commend you and encourage you for your efforts and your courage to testify here today.

The CHAIRMAN. The gentleman's time has expired. Mr. Yoho, for 5 minutes.

Mr. YOHO. Thank you, Mr. Chairman, and Mr. Costa, being a veterinarian, large animal practitioner that earned a living on the south end of a north-bound horse or cow, it wasn't manure. It was fertilizer until it hit the ground.

I appreciate you all being here, and we as the people in government—because government is a non-entity. It is only as good as the people that are involved in it, in all branches of it, that we need to do a better job on educating both us and government and the public on educating people and in public venues to get the best, the current, and the correct information out to the public that is updated and is based on peer-reviewed science, and it is stemming from accurate research. And we also need to do a better job of making current the information and policies on a website of what a GMO is and what it is not and keep agendas or politics out of it and let the facts speak for themselves.

Dr. Federoff, if you could take us briefly through the process of taking a genetically modified product from the beginning to the market in less than a minute, I would be really appreciative if you could. But just the research that goes behind that before it is approved.

Dr. FEDOROFF. Okay. Let me try to summarize it really quickly. So to begin with, you have to identify the gene that you want to introduce. You have to introduce it into the organism. This is not a trivial process for a plant such as corn. You make a lot of these, put them in the greenhouse, figure out which ones and you take bits of the plant and you analyze it genetically by DNA sequencing and so forth. But then you have to check everything from testing the product of the gene for toxicity and allergenicity to putting together all of the dossiers that are required by the various agencies that need to approve that product. In some cases it has to be the EPA, the FDA, and the USDA.

Mr. YOHO. And the USDA.

Dr. FEDOROFF. Okay? And in the case of animals, genetically modified animals, like AquaBounty salmon, it is even more onerous because the FDA has decided to regulate them like drugs.

Mr. YOHO. And what you have done is adequate because it is years of research, years of studies, years of feed studies, and then the tissue samples and all those things that come with that, and it costs millions if not billions of dollars, and it finally does get the approval of USDA, the FDA, the EPA. We have a variety in Florida of a papaya that they have been working on for 10 years for rig spot virus. The EPA signed off on it. But yet, it is still not to mar-

ket because of this GMO scare around it, and it needs to be approved.

With the studies, are you aware of any peer-reviewed real studies that you know of that have proven to be deleterious or detrimental effects on humans, animals, plants, or the environment——

Dr. FEDOROFF. None.

Mr. YOHO.—of a product.

Dr. FEDOROFF. There are occasional——

Mr. YOHO. What was that?

Dr. FEDOROFF. None.

Mr. YOHO. I just wanted to hear it again so——

Dr. FEDOROFF. Yes.

Mr. YOHO.—so everybody heard that. None.

Dr. FEDOROFF. None. There are occasional anecdotal reports.

Mr. YOHO. Anecdotal.

Dr. FEDOROFF. Very often, the publication is retracted or never gets published but gets into the social media and Internet and stuff.

Mr. YOHO. Let me ask you all this. Would a GMO that had any deleterious effects to humans, animal, plants, or the environment ever get approved by the USDA, FDA, or EPA? So there was really—the science is on our side on these labelings. It is a marketing thing. So if a GMO has been approved by the USDA, one should rest assured that that product is as safe as any non-GMO product or it wouldn't be out there.

In addition, we have been doing GMOs for 20, 30, 40 years. Mother Nature has been doing it since the beginning of time. We would not have wheat had the plants not cross-pollinated to form the wheat we have today, and tomatoes, as we know, comes from a toxic source, so do potatoes, the Solana family. And they are toxic. They are related to nightshade.

Dr. FEDOROFF. You bet.

Mr. YOHO. Yet through genetic modification of Mother Nature, they have healed themselves, and we have what we have. And if we didn't have the GMOs today, I would hate to think what the food security of this world would be. In my home State of Florida when I graduated from veterinary college, we produced about 75 bushels of corn. That was a great yield. Today we are doing 250 to 275 bushels of corn on poor soil, and therefore, the common sense of the sound science that leads to the approval of the GMOs should not be overshadowed by the environmental McCarthyism of the anti-GMO crowd. And I just want to thank you for being out there, for being in the fight, and for standing up, Ms. Lidback. Like last time when we talked about this, we got a lot of hate mail. Hang tough because you are on the right side of the science. Thank you.

Mr. Chairman, I yield back.

The CHAIRMAN. Ms. Adams?

Ms. ADAMS. Thank you, Mr. Chairman, and thank you to our guests today. There has been a lot of confusion over what qualifies as a label for food that contains ingredients derived from a GMO. Consumers I believe deserve to know what is in their food, but it is also necessary that FDA implement regulations to ensure that the labeling of GMO products is fair and standardized and trans-

parent. Market-driven labeling ensures that the information they demand about the food being sold is clear and accurate without the confusion of dozens of different labels.

Mr. Clarkson, your testimony indicated that the best way to support consumers is through a national standard that includes a voluntary labeling program. So if the program is voluntary, how long would you expect for retailers and producers to begin participating in the program?

Mr. CLARKSON. Well, there are quite a few retailers and processors participating in private programs right now that would quickly switch to a national definition enforced by the USDA. So I would expect within a year you would see very significant movement toward the national standard usage.

Ms. ADAMS. As a follow-up, GMO crops are often sprayed with high amounts of herbicide since they can survive being sprayed in Round-Up. This may wash into lakes and streams. Mother Nature eventually takes its course and weeds may become resistant to a chemical, thus requiring the use of more toxic herbicides.

Here is my question: how can we work with farmers to improve crop rotation so that weeds don't become resistant to herbicides so quickly?

Mr. CLARKSON. That would involve using multiple approaches to weed control rather than a single approach. It would involve rotations of crops. It would involve use of cover crops, all of which are projects that are under way. And we are starting to see benefits from those.

Ms. ADAMS. Thank you. Mr. Schmidt, last summer your group conducted a survey to engage Americans' views of foods containing bioengineered ingredients. How do consumers view the current FDA policy allowing voluntary labeling for food products through biotechnology?

Mr. SCHMIDT. Thank you, Ms. Adams. Our survey found that 63 percent of U.S. consumers support the current FDA policy that says that there should not be any special labeling of foods produced through biotechnology unless there is a change in the nutritional content, introduction of a safety issue such as an allergen, and even then, you would identify what that change was, not the process used to produce the product. And so Americans do—so it is a case of when you explain information and give consumers credit, they tend to understand it and support it.

Ms. ADAMS. All right. Thank you very much, and Mr. Chairman, I yield back.

Mr. AUSTIN SCOTT of Georgia [presiding]. Thank you for being here, ladies and gentlemen, and I will try to be brief. One of my concerns is not only that this labeling stop at the state level but that you could actually see individual counties and municipalities trying to come up with their own labeling standards. And therefore, you have six, seven, eight different standards in any given state. That would obviously have a tremendous impact on business owners, the grocery retailers, on the one side of the county line or city limit sign *versus* those who were on the other side.

I would typically steer toward states' rights on these issues. This is one where I do believe that without a uniform standard, we are

going to see tremendous increases in the cost of groceries for the American citizen.

I will also tell you that this is a perception issue, and the more times we use the initials GMO or genetically modified, the worse it is for us. The term *biotechnology,* is a more accurate description of what we are using to get across where we actually use less pesticides and less herbicides. We don't want to put those things on our land. They cost money to apply them, and we as farmers want a clean environment as well.

It is interesting this past week as I listened—my wife and I were blessed to have a little girl, and I listened to the midwife as she was talking about groceries in making sure that they had no GMOs, and at the same time she turned around and recommended a tremendous number of things that were also products of biotechnology. And my wife suggested I shouldn't say anything to her because she might be delivering our daughter, but now that our daughter is here, I am free to say some of those things.

But the misperception out there has to be addressed. Biotechnology has made our life better, whether it is through pharmaceuticals or whether it is through our crops. And if I go to the Land O' Lakes' website, I can look up Land O' Lakes butter, and I know exactly what is in the products that I am consuming. This isn't about what is in the products that we eat. It is about what is in the seed that is planted. And I wonder if the same advocates for the labeling of our food supply, why aren't they suggesting that it should be done in our pharmaceutical supply as well because those are the things that we ingest.

So again, just reiterating, and Mr. Schmidt, I will go to you since we are down to 2 minutes. The use of biotechnology for our food and agriculture and pharmaceutical products have made our lives better. We are living longer than we ever have. Americans eat hundreds of millions of meals a day, literally. And my question is, how would it impact our ability to provide affordable and nutritious food to the American families, and would it not raise the cost of food, thereby hurting low-income Americans more than anybody, if we are not able to come up with a uniform labeling standard?

Mr. SCHMIDT. I have to say we have not done the economic studies ourselves, but you have heard some very compelling testimony from the panel regarding the economics of this, I just think in general everyone wants to provide an informed choice for consumers, but that word *informed* is critical. And too often we are allowing misinformed choices out there by not standing up and correcting misinformation in the marketplace. So that is the opportunity to be transparent, to provide as much information as possible that meets consumer interest and demand, while also keeping the marketplace fair for accurate information on food and nutrition.

Mr. AUSTIN SCOTT of Georgia. Do you see any movement to label anything other than agricultural products with the same type of skull and crossbones, if you will?

Mr. SCHMIDT. Yes. As a communications group we hear ideas about labeling lots of different things. We know other industries—there has been some discussion about the alcohol industry, some calling for labeling there as well. You can ask consumers in general, would you like X to be labeled, and if you make it sound scary

enough, everyone is going to say yes. And that is the thing about technology. It is easy to make it sound scary. Maybe it is less interesting to say that it is safe and effective, but those are the facts.

Mr. AUSTIN SCOTT of Georgia. Well, the fact that Americans eat hundreds of millions of meals a day and we spend less for food than virtually any other industrialized nation out there is proof that what we have been doing is working, and if it wasn't, our life expectancy wouldn't be continuing to expand.

So thank you very much for being here. With that, I will turn it back over to the big Chairman.

The CHAIRMAN [presiding]. I want to thank the panel for being here today. Dr. Federoff, a couple of things.

You were about to finish your comments about Round-Up and also from responding to Ms. Adams' comments—she had some question about Round-Up or glyphosate that you were going to answer. Did you have any comments about that one statement that came out Friday?

Dr. FEDOROFF. Only that the preponderance of studies shows it to be safe and not carcinogenic. The current ruling of the UN body, the cancer, IARC or something like that, is not based on any new information.

The CHAIRMAN. Okay. The overall weight, just to be crystal clear, the overall weight, the preponderance of the evidence, is that—and I am going to get with Mr. Schmidt. I want to use your bioengineered, genetically engineered—the weight, Dr. Federoff, is that it is safe and that it is—I am just using in reference to Mr. Schmidt because he told me to use something other than GMO because that is fairly pejorative.

VOICE. He wants you to——

The CHAIRMAN. Let us just stay with you, Dr. Federoff. The preponderance of the science is that bioengineered—

Dr. FEDOROFF. The food——

The CHAIRMAN.—processing is safe.

Dr. FEDOROFF. The current biotechnologically altered food crops and potentially animals are as safe as their non-GM counterparts.

The CHAIRMAN. All right.

Dr. FEDOROFF. I am afraid that GM label is going to stick. It is the fastest thing to call it.

The CHAIRMAN. I got you. Well, again, we thank the panel for coming today and spending your time with us. Ms. Lidback, I hope it doesn't repeat your experience from last year, and if it does, well, it is a shame. It is unfortunate, because we could all have differences of opinion. Dr. Federoff, you said those opinions ought to be based in fact. We don't have any requirement for that, but it ought to be the case, and we hope that this hearing today sheds some light on a really important issue.

Well, for those on the Committee, the record of today's hearing will remain open for 10 calendar days to receive additional material and supplementary written responses from the witnesses to any questions posed by a Member. This hearing of the Committee on Agriculture is adjourned.

[Whereupon, at 12:12 p.m., the Committee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED ARTICLES BY HON. JAMES P. MCGOVERN, A REPRESENTATIVE IN CONGRESS FROM MASSACHUSETTS

***International Agency for Research on Cancer (IARC), World Health Organization***

**IARC Monographs Volume 112: Evaluation of Five Organophosphate Insecticides and Herbicides**

20 March 2015

**Lyon, France, 20 March 2015**—The International Agency for Research on Cancer (IARC), the specialized cancer agency of the World Health Organization, has assessed the carcinogenicity **of five organophosphate pesticides.** A summary of the final evaluations together with a short rationale have now been published online in *The Lancet Oncology,** and the detailed assessments will be published as Volume 112 of the IARC Monographs.

**What were the results of the IARC evaluations?**

The herbicide **glyphosate** and the insecticides **malathion** and **diazinon** were classified as *probably carcinogenic to humans* (Group 2A).

The insecticides **tetrachlorvinphos** and **parathion** were classified as *possibly carcinogenic to humans* (Group 2B).

**What was the scientific basis of the IARC evaluations?**

The pesticides **tetrachlorvinphos** and **parathion** were classified as *possibly carcinogenic to humans* (Group 2B) based on convincing evidence that these agents cause cancer in laboratory animals.

For the insecticide **malathion,** there is *limited evidence of carcinogenicity* in humans for non-Hodgkin lymphoma and prostate cancer. The evidence in humans is from studies of exposures, mostly agricultural, in the USA, Canada, and Sweden published since 2001. Malathion also caused tumours in rodent studies. Malathion caused DNA and chromosomal damage and also disrupted hormone pathways.

For the insecticide **diazinon,** there was *limited evidence of carcinogenicity* in humans for non-Hodgkin lymphoma and lung cancer. The evidence in humans is from studies of agricultural exposures in the USA and Canada published since 2001. The classification of diazinon in Group 2A was also based on strong evidence that diazinon induced DNA or chromosomal damage.

For the herbicide **glyphosate,** there was *limited evidence of carcinogenicity* in humans for non-Hodgkin lymphoma. The evidence in humans is from studies of exposures, mostly agricultural, in the USA, Canada, and Sweden published since 2001. In addition, there is convincing evidence that glyphosate also can cause cancer in laboratory animals. On the basis of tumours in mice, the United States Environmental Protection Agency (*http://www.epa.gov/opp00001/chem_search/cleared_reviews/csr_PC-103601_30-Oct-91—265.pdf*) (U.S. EPA) originally classified glyphosate as *possibly carcinogenic to humans* (Group C) in 1985. After a re-evaluation of that mouse study, the U.S. EPA changed its classification to *evidence of non-carcinogenicity in humans* (Group E) in 1991. The U.S. EPA Scientific Advisory Panel noted that the re-evaluated glyphosate results were still significant using two statistical tests recommended in the IARC Preamble (*http://monographs.iarc.fr/ENG/Preamble/index.php*). The IARC Working Group that conducted the evaluation considered the significant findings from the U.S. EPA report and several more recent positive results in concluding that there is *sufficient evidence of carcinogenicity* in experimental animals. Glyphosate also caused DNA and chromosomal damage in human cells, although it gave negative results in tests using bacteria. One study in community residents reported increases in blood markers of chromosomal damage (micronuclei) after glyphosate formulations were sprayed nearby.

**How are people exposed to these pesticides?**

**Tetrachlorvinphos** is banned in the European Union. In the USA, it continues to be used on livestock and companion animals, including in pet flea collars. No information was available on use in other countries.

**Parathion** use has been severely restricted since the 1980s. All authorized uses were cancelled in the European Union and the USA by 2003.

**Malathion** is currently used in agriculture, public health, and residential insect control. It continues to be produced in substantial volumes throughout the world. Workers may be exposed during the use and production of malathion. Exposure to the general population is low and occurs primarily through residence near sprayed areas, home use, and diet.

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* **Editor's note:** the referenced summary is included as ATTACHMENT.

**Diazinon** has been applied in agriculture and for control of home and garden insects. Production volumes have been relatively low and decreased further after 2006 due to restrictions in the USA and the European Union. Only limited information was available on the use of these pesticides in other countries.

**Glyphosate** currently has the highest global production volume of all herbicides. The largest use worldwide is in agriculture. The agricultural use of glyphosate has increased sharply since the development of crops that have been genetically modified to make them resistant to glyphosate. Glyphosate is also used in forestry, urban, and home applications. Glyphosate has been detected in the air during spraying, in water, and in food. The general population is exposed primarily through residence near sprayed areas, home use, and diet, and the level that has been observed is generally low.

**What do Groups 2A and 2B mean?**

Group 2A means that the agent is ***probably*** *carcinogenic to humans.* This category is used when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. *Limited evidence* means that a positive association has been observed between exposure to the agent and cancer but that other explanations for the observations (called chance, bias, or confounding) could not be ruled out. This category is also used when there is limited evidence of carcinogenicity in humans and strong data on how the agent causes cancer.

Group 2B means that the agent is ***possibly*** *carcinogenic to humans.* A categorization in Group 2B often means that there is convincing evidence that the agent causes cancer in experimental animals but little or no information about whether it causes cancer in humans.

**Why did IARC evaluate these pesticides?**

The IARC Monographs Programme has evaluated numerous pesticides, some as recently as 2012 (anthraquinone, (*http://monographs.iarc.fr/ENG/Monographs/vol101/mono101-001.pdf*) arsenic and arsenic compounds (*http://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C-6.pdf*)). However, substantial new data are available on many pesticides that have widespread exposures. In 2014, an international Advisory Group (*http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045%2814%2970168-8/fulltext*) of senior scientists and government officials recommended dozens of pesticides for evaluation. Consistent with the advice of the Advisory Group, the recent IARC meeting provided new or updated evaluations on five organophosphate pesticides.

**How were the evaluations conducted?**

The established procedure for Monographs evaluations is described in the Programme's Preamble (*http://monographs.iarc.fr/ENG/Preamble/index.php*). Evaluations are performed by panels of international experts, selected on the basis of their expertise and the absence of real or apparent conflicts of interest. For Volume 112, a Working Group of 17 experts from 11 countries met at IARC on 3–10 March 2015 to assess the carcinogenicity of **tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate.** The in-person meeting followed nearly a year of review and preparation by the IARC secretariat and the Working Group, including a comprehensive review of the latest available scientific evidence. According to published procedures (*http://monographs.iarc.fr/ENG/Preamble/index.php*), the Working Group considered "reports that have been published or accepted for publication in the openly available scientific literature" as well as "data from governmental reports that are publicly available". The Working Group did not consider summary tables in online supplements to published articles, which did not provide enough detail for independent assessment.

**What are the implications of the IARC evaluations?**

The Monographs Programme provides scientific evaluations based on a comprehensive review of the scientific literature, but it remains the responsibility of individual governments and other international organizations to recommend regulations, legislation, or public health intervention.

Media inquiries: please write to *com@iarc.fr*. Thank you.

ATTACHMENT

*www.thelancet.com/oncology* **Published online March 20, 2014** *http://dx.doi.org/10.1016/S1470-2045(15)70134-8*

*News*

**Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate**

In March, 2015, 17 experts from 11 countries met at the International Agency for Research on Cancer (IARC; Lyon, France) to assess the carcinogenicity of the organophosphate pesticides tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate (table). These assessments will be published as volume 112 of the IARC Monographs.[1]

The insecticides tetrachlorvinphos and parathion were classified as "possibly carcinogenic to humans" (Group 2B). The evidence from human studies was scarce and considered inadequate. Tetrachlorvinphos induced hepatocellular tumours (benign or malignant) in mice, renal tubule tumours (benign or malignant) in male mice,[2] and spleen haemangioma in male rats. Tetrachlorvinphos is a reactive oxon with affinity for esterases. In experimental animals, tetrachlorvinphos is systemically distributed, metabolised, and eliminated in urine. Although bacterial mutagenesis tests were negative, tetrachlorvinphos induced genotoxicity in some assays (chromosomal damage in rats and *in vitro*) and increased cell proliferation (hyperplasia in rodents). Tetrachlorvinphos is banned in the European Union. In the USA, it continues to be used on animals, including in pet flea collars.

For parathion, associations with cancers in several tissues were observed in occupational studies, but the evidence in humans remains sparse. In mice, parathion increased bronchioloalveolar adenoma and/or carcinoma in males, and lymphoma in females. In rats, parathion induced adrenal cortical adenoma or carcinoma (combined),[3] malignant pancreatic tumours, and thyroid follicular cell adenoma in males, and mammary gland adenocarcinoma (after subcutaneous injection in females).[4] Parathion is rapidly absorbed and distributed. Parathion metabolism to the bioactive metabolite, paraoxon, is similar across species. Although bacterial mutagenesis tests were negative, parathion induced DNA and chromosomal damage in human cells in vitro. Parathion markedly increased rat mammary gland terminal end bud density.[4] Parathion use has been severely restricted since the 1980s.

The insecticides malathion and diazinon were classified as "probably carcinogenic to humans" (Group 2A). Malathion is used in agriculture, public health, and resi-

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For more on the **IARC Monographs** see *http://monographs.iarc.fr*.

**Upcoming meetings**

June 2–9, 2015, Volume 113: Some organochlorine insecticides and some chlorphenoxy herbicides

Oct. 6–13, 2015, Volume 114: Red meat and processed meat Monograph Working Group

**Members**

A. Blair (USA)—Meeting Chair; L. Fritschi (Australia); J. McLaughlin; C.M. Sergi (Canada); G.M. Calaf (Chile); F. Le Curieux (Finland); I. Baldi (France); F. Forastiere (Italy); H. Kromhout (Netherlands); A.'t Mannetje (New Zealand); T. Rodriguez [unable to attend] (Nicaragua); P. Egeghy [unable to attend], G.D. Jahnke; C.W. Jameson; M.T. Martin; M.K. Ross; I. Rusyn; L. Zeise (USA)

**Invited Specialists**

C. Portier (Switzerland)

**Representatives**

M.E. Gouze, for the French Agency for Food, Environment and Occupational Health and Safety (France); J. Rowland, for the U.S. Environmental Protection Agency (USA)

**Observers**

M.K. Boye Jensen, for Cheminova (Denmark); B. Fervers, for the Léon Bérard Centre (France); E. Giroux, for University Jean-Moulin Lyon 3 (France); T. Sorahan, for Monsanto Company (USA); C. Strupp, for the European Crop Protection Association (Belgium); P. Sutton, for the University of California, San Francisco (USA)

**IARC/WHO Secretariat**

L. Benbrahim-Tallaa; R. Carel; F. El Ghissassi; Sonia El-Zaemey; Y. Grosse; N. Guha; K.Z. Guyton; C. Le Cornet; M. Leon; D. Loomis; H. Mattock; C. Scoccianti; A. Shapiro; K. Straif; J. Zavadil

For the **Preamble to the IARC Monographs** see *http://monographs.iarc.fr/ENG/Preamble/index.php*.

For declarations of interests see *http://monographs.iarc.fr/ENG/Meetings/vol112-participants.pdf*.

dential insect control. It continues to be produced in substantial volumes throughout the world. There is limited evidence in humans for the carcinogenicity of malathion. Case-control analyses of occupational exposures reported positive associations with non-Hodgkin lymphoma in the USA,[5] Canada,[6] and Sweden,[7] although no increased risk of non-Hodgkin lymphoma was observed in the large Agricultural Health Study cohort (AHS). Occupational use was associated with an increased risk of prostate cancer in a Canadian case-control study [8] and in the AHS, which reported a significant trend for aggressive cancers after adjustment for other pesticides.[9] In mice, malathion increased hepatocellular adenoma or carcinoma (combined).[10] In rats, it increased thyroid carcinoma in males, hepatocellular adenoma or carcinoma (combined) in females, and mammary gland adenocarcinoma after subcutaneous injection in females.[4] Malathion is rapidly absorbed and distributed. Metabolism to the bioactive metabolite, malaoxon, is similar across species. Malaoxon strongly inhibits esterases; atropine reduced carcinogenesis-related effects in one study.[4] Malathion induced DNA and chromosomal damage in humans, corroborated by studies in animals and *in vitro.* Bacterial mutagenesis tests were negative. Compelling evidence supported disruption of hormone pathways. Hormonal effects probably mediate rodent thyroid and mammary gland proliferation.

| | Activity (current status) | Evidence in humans (cancer sites) | Evidence in animals | Mechanistic evidence | Classification * |
|---|---|---|---|---|---|
| Tetrachlorvinphos | Insecticide (restricted in the EU and for most uses in the USA) | Inadequate | Sufficient | •• | 2B |
| Parathion | Insecticide (restricted in the USA and EU) | Inadequate | Sufficient | •• | 2B |
| Malathion | Insecticide (currently used; high production volume chemical) | Limited (non-Hodgkin lymphoma, prostate) | Sufficient | Genotoxicity, oxidative stress, inflammation, receptor-mediated effects, and cell proliferation or death | †2A |
| Diazinon | Insecticide (restricted in the USA and EU) | Limited (non-Hodgkin lymphoma, leukaemia, lung) | Limited | Genotoxicity and oxidative stress | †2A |
| Glyphosate | Herbicide (currently used; highest global production volume herbicide) | Limited (non-Hodgkin lymphoma) | Sufficient | Genotoxicity and oxidative stress | †2A |

EU=European Union. *See the International Agency for Research on Cancer (IARC) preamble for explanation of classification system (amended January, 2006). †The 2A classification of diazinon was based on limited evidence of carcinogenicity in humans and experimental animals, and strong mechanistic evidence; for malathion and glyphosate, the mechanistic evidence provided independent support of the 2A classification based on evidence of carcinogenicity in humans and experimental animals.

***Table:*** **IARC classification of some organophosphate pesticides**

Diazinon has been applied in agriculture and for control of home and garden insects. There was limited evidence for diazinon carcinogenicity in humans. Positive associations for non-Hodgkin lymphoma, with indications of exposure-response trends, were reported by two large multicentre case-control studies of occupational exposures.[5, 6] The AHS reported positive associations with specific subtypes, which persisted after adjustment for other pesticides, but no overall increased risk of non-Hodgkin lymphoma.[11] Support for an increased risk of leukaemia in the AHS was strengthened by a monotonic increase in risk with cumulative diazinon exposure after adjustment for other pesticides. Multiple updates from the AHS consistently showed an increased risk of lung cancer with an exposure-response association that was not explained by confounding by other pesticides, smoking, or other established lung cancer risk factors.[12] Nonetheless, this finding was not replicated in other populations. In rodents, diazinon increased hepatocellular carcinoma in mice and leukaemia or lymphoma (combined) in rats, but only in males receiving the low dose in each study. Diazinon induced DNA or chromosomal damage in rodents and in human and mammalian cells in vitro. Some additional support for human relevance was provided by a positive study of a small number of volunteers exposed to a diazinon formulation.[13]

Glyphosate is a broad-spectrum herbicide, currently with the highest production volumes of all herbicides. It is used in more than 750 different products for agriculture, forestry, urban, and home applications. Its use has increased sharply with the development of genetically modified glyphosate-resistant crop varieties. Glyphosate has been detected in air during spraying, in water, and in food. There was limited evidence in humans for the carcinogenicity of glyphosate. Case-control studies of occupational exposure in the USA,[14] Canada,[6] and Sweden[7] reported increased risks for non-Hodgkin lymphoma that persisted after adjustment for other pesticides. The AHS cohort did not show a significantly increased risk of non-Hodgkin lymphoma. In male CD-1 mice, glyphosate induced a positive trend in the incidence of a rare tumour, renal tubule carcinoma. A second study reported a positive trend for haemangiosarcoma in male mice.[15] Glyphosate increased pancreatic islet-cell adenoma in male rats in two studies. A glyphosate formulation promoted skin tumours in an initiation-promotion study in mice.

Glyphosate has been detected in the blood and urine of agricultural workers, indicating absorption. Soil microbes degrade glyphosate to aminomethylphosphoric acid (AMPA). Blood AMPA detection after poisonings suggests intestinal microbial metabolism in humans. Glyphosate and glyphosate formulations induced DNA and chromosomal damage in mammals, and in human and animal cells in vitro. One study reported increases in blood markers of chromosomal damage (micronuclei) in residents of several communities after spraying of glyphosate formulations.[16] Bacterial mutagenesis tests were negative. Glyphosate, glyphosate formulations, and AMPA induced oxidative stress in rodents and *in vitro.* The Working Group classified glyphosate as "probably carcinogenic to humans" (Group 2A).

We declare no competing interests.

*Kathryn Z Guyton, Dana Loomis, Yann Grosse, Fatiha El Ghissassi, Lamia Benbrahim-Tallaa, Neela Guha, Chiara Scoccianti, Heidi Mattock, Kurt Straif, on behalf of the International Agency for Research on Cancer Monograph Working Group, IARC, Lyon, France International Agency for Research on Cancer, Lyon, France*

**Endnotes**

[1] International Agency for Research on Cancer Volume 112: Some organophosphate insecticides and herbicides: tetrachlorvinphos, parathion, malathion, diazinon and glyphosate. IARC Working Group. Lyon; 3–10 March 2015. *IARC Monogr. Eval. Carcinog. Risk Chem. Hum.* (in press).

[2] Parker C.M., Van Gelder G.A., Chai E.Y., *et al. Oncogenic evaluation of tetrachlorvinphos in the B6C3F1 mouse.* FUNDAM. APPL. TOXICOL. 1985; 5: 840–54.

[3] National Toxicology Program. *Bioassay of parathion for possible carcinogenicity.* Natl. Cancer. Inst. Carcinog. Tech. Rep. Ser. 1979; 70: 1–123.

[4] Cabello G., Valenzuela M., Vilaxa A., *et al. A rat mammary tumor model induced by the organophosphorous pesticides parathion and malathion, possibly through acetylcholinesterase inhibition.* ENVIRON. HEALTH PERSPECT. 2001; 109: 471–79.

[5] Waddell B.L., Zahm S.H., Baris D., *et al. Agricultural use of organophosphate pesticides and the risk of non-Hodgkin's lymphoma among male farmers (United States).* CANCER CAUSES CONTROL 2001; 12: 509–17.

[6] McDuffie H.H., Pahwa P., McLaughlin J.R., *et al. Non-Hodgkin's lymphoma and specific pesticide exposures in men: cross-Canada study of pesticides and health.* CANCER EPIDEMIOL. BIOMARKERS PREV. 2001; 10: 1155–63.

[7] Eriksson M, Hardell L, Carlberg M, Akerman M. *Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis.* INT. J. CANCER 2008; 123: 1657–63.

[8] Band P.R., Abanto Z., Bert J., *et al. Prostate cancer risk and exposure to pesticides in British Columbia farmers.* PROSTATE 2011; 71: 168–83.

[9] Koutros S., Beane, Freeman L.E., *et al. Risk of total and aggressive prostate cancer and pesticide use in the Agricultural Health Study.* AM. J. EPIDEMIOL. 2013; 177: 59–74.

[10] U.S. Environmental Protection Agency. *Peer review of malathion: 18-month carcinogenicity study in mice. http://www.epa.gov/opp00001/chem_search/cleared_reviews/csr_PC-057701_undated_004.pdf* (accessed March 6, 2015).

[11] Alavanja M.C., Hofmann J.N., Lynch C.F., *et al. Non-Hodgkin lymphoma risk and insecticide, fungicide and fumigant use in the agricultural health study.* PLoS ONE 2014; 9: e109332.

[12] Jones R.R., Barone-Adesi F., Koutros S., *et al. Incidence of solid tumors among pesticide applicators exposed to the organophosphate insecticide diazinon in the Agricultural Health Study: an updated analysis.* OCCUP. ENVIRON. MED. 2015 (in press).

[13] Hatjian B.A., Mutch E., Williams F.M., Blain P.G., Edwards J.W. *Cytogenetic response without changes in peripheral cholinesterase enzymes following exposure to a sheep dip containing diazinon* ***in vivo*** *and* ***in vitro.*** MUTAT. RES. 2000; 472: 85–92.

[14] De Roos A.J., Zahm S.H., Cantor K.P., *et al. Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men.* OCCUP. ENVIRON. MED. 2003; 60: E11.

[15] WHO/FAO. Glyphosate. *Pesticides residues in food 2004 Joint FAO/WHO Meeting on Pesticides Residues.* PART II TOXICOLOGICAL. IPCS/WHO 2004; 95–162. *http://www.who.int/foodsafety/areas—work/chemical-risks/jmpr/en/* (accessed March 6, 2015).

[16] Bolognesi C., Carrasquilla G., Volpi S., Solomon K.R., Marshall E.J. *Biomonitoring of genotoxic risk in agricultural workers from fi ve Colombian regions: association to occupational exposure to glyphosate.* J. TOXICOL. ENVIRON. HEALTH A. 2009; 72: 986–97.

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SUBMITTED ARTICLE BY HON. K. MICHAEL CONAWAY, A REPRESENTATIVE IN CONGRESS FROM TEXAS

***Bundesinstitut fũr Risikobewertung***

**Does glyphosate cause cancer?**

*www.bfr.bund.de*

BfR Communication No 007/2015, 23 March 2015

In its recent evaluation from March 2015, the International Agency for Cancer Research (IARC), as the specialized cancer agency of the World Health Organization (WHO), came to the conclusion that glyphosate should now be classified as a carcinogenic substance in Group 2A (probably carcinogenic to humans), based on "limited evidence" in human-experiments and "sufficient evidence" in animal-experiments. This classification was published in a short report in the "Lancet" journal on 20 March 2015.

As the "Rapporteur Member State" for the active substance glyphosate within the framework of EU re-evaluation, the Federal Institute for Risk Assessment (BfR) was responsible for the human health risk assessment and has assessed glyphosate as non-carcinogenic. This was supported by competent national, European and other international institutions for health assessment including the WHO/FAO Joint Meeting on Pesticide Residues (JMPR). BfR is therefore issuing its comments on this classification by IARC based on the published short report.

The International Agency for Research on Cancer (IARC) is the specialized cancer agency of the World Health Organization. The main objective of the IARC is to promote international collaboration in cancer research. The evaluations of carcinogenic risk are made by international working groups of independent scientists and are qualitative in nature. No recommendation is given for regulation or legislation. For this reason, 17 experts from 11 countries met at the International Agency for Research on Cancer (IARC; Lyon, France) in March 2015 in order to assess the carcinogenic or potentially carcinogenic effects of four organophosphates and glyphosate. The working group classified glyphosate as "probably carcinogenic to humans". This assessment will be published as volume 112 of the IARC Monographs.

In the opinion of BfR, the classification of glyphosate as "carcinogenic in Group 2A" (probably carcinogenic to humans) as published in the 20 March 2015 issue of the "Lancet" journal comes as a surprise, since other evaluations performed by supranational bodies such as the WHO-Panel of the Joint Meeting of Pesticide residues (JMPR, 2004), and also by national regulatory agencies such as the U.S. EPA had concluded the contrary, *i.e.,* that glyphosate was not carcinogenic. Unfortunately, the database on which the IARC evaluation is based is not known, since a background monograph that is usually produced by IARC following the evaluation meetings has not yet been released. Therefore, a comprehensive and scientifically sound consideration of the data and arguments that led to the IARC- conclusion is simply not possible at the moment.

In addition, Germany is the "Rapporteur Member State" in the ongoing reevaluation process of glyphosate in the EU. For this purpose, an extensive "Renewal Assessment Report" (RAR) was provided in 2013 and has been revised in 2014 and again in 2015. The 2013 report was circulated by EFSA to the EU Member States and was made available for public consultation in 2014. Revisions were made to take into account the several hundred comments and remarks. The toxicological and residue chapters of the report have been prepared by the Federal Institute for Risk Assessment (BfR). For this purpose, BfR has compiled the most comprehensive toxicological database, presumably worldwide, for glyphosate. This database comprises hundreds of studies that were performed by or on behalf of the many manufacturers of glyphosate and thousands of references from the open literature. This huge amount of data makes glyphosate nearly unique among the active substances in plant protection products. BfR thinks that the entire database must be taken into account for toxicological evaluation and risk assessment of a substance and not merely a more or less arbitrary selection of studies.

In the absence of more reliable information from IARC, BfR has tried to allocate the findings that are mentioned in the brief "Lancet" publication to certain studies in our database and, by doing that, to put them into perspective.

The new IARC classification for glyphosate as a carcinogenic substance is based firstly on "limited evidence" in humans. This risk is derived from three epidemiological studies in the USA, Canada and Sweden based on a statistical correlation between exposure to glyphosate and an increased risk of non-Hodgkin lymphoma. However, this assessment was not confirmed in a very large cohort of the also cited "Agricultural Health Study" or in other studies. A recent publication from 2012 has reviewed the epidemiologic literature to evaluate whether exposure to glyphosate is associated causally with cancer risk in humans and the relevant methodological and biomonitoring studies of glyphosate. The review found non-consistent patterns of positive associations indicating a causal relationship between total cancer or any site-specific cancer and exposure to glyphosate. The current report of BfR to the EU based on the evaluation of over 30 epidemiological studies came to the overall assessment that there is no validated or significant relationship between exposure to glyphosate and an increased risk of non-Hodgkin lymphoma or other types of cancer.

Secondly, IARC points to findings of studies based on animal experiments submitted by the producers of glyphosate as evidence for the carcinogenic effect of glyphosate. All these findings were also considered in the glyphosate assessments of BfR, which did support the conclusion of the Joint Meeting on Pesticide Residues (JMPR) of the FAO/WHO responsible for the assessment of active substances in pesticides: "In view of the absence of a carcinogenic potential in animals and the lack of genotoxicity in standard tests, the Meeting concluded that glyphosate is unlikely to pose a carcinogenic risk to humans". BfR does not have any information as to how many of the 11 long-term studies on rats and mice that were assessed as valid were available to IARC.

Moreover, IARC concluded that a glyphosate formulation promoted skin tumours. In general, testing of formulations should not be used for toxicological evaluation of active substances because co-formulants may alter the outcome to a large extent. Therefore, the claim, based on this two-stage cancer model in mice, that a highly concentrated, skin-irritating formulation containing the active substance promotes skin tumours is not considered by the institutions in the EU to be evidence for the carcinogenic properties of glyphosate.

It is not possible to fully examine the indications for the genotoxic potential of glyphosate based on the short report published by IARC, in particular due to the fact that the assessment included studies using formulations that are not specified in any detail.

The fact that different bodies assess issues differently due to differing information and assessments of experimental data is part and parcel of the risk assessment process. BfR will therefore perform a thorough review of the classification issued by IARC once the monograph becomes available.

SUBMITTED LETTER BY HON. ANN KIRKPATRICK, A REPRESENTATIVE IN CONGRESS FROM ARIZONA

***Pontificium Consilium de Iustitia et Pace***

**The World Food Prize**

*Borlaug Dialogue International Symposium*

17 October 2013

On behalf of the Pontifical Council for Justice and Peace, I thank you warmly for your very kind invitation to participate in the *World Food Prize* event of this year, and for your warm welcome.

As you may know, about 50 years ago, the Second Vatican Council carefully reviewed the mission of the Catholic Church in the modern world. The Council found it urgent that the Church, with all her resources, accompany humanity in its walk through history. She made her own "*the joys and the hopes, the griefs and the anxieties of the [people] of this age, especially those who are poor or in any way afflicted.*"[1] Recently Pope Francis put it straightforwardly to a meeting of the Food and Agriculture Organization of the United Nations (FAO): "*the Catholic Church, with all her structures and institutions, is at your side,*"[2] that is, at the side of everyone who seeks in good faith to meet the challenges of world hunger.

The Vatican Department that was mandated to study and to promote the Church's accompaniment of humanity is the *Pontifical Council for Justice and Peace,* which I preside over. And the spirit of our work—and of my presence—is beautifully expressed by Vatican II with these words: "Giving witness and voice to the faith of the whole people of God gathered together by Christ, this Council can provide no more eloquent proof of its solidarity with, as well as its respect and love for the entire human family, than by engaging with it in ***conversation*** about these various problems."[3]

*To engage in* ***conversation*** *about the problems of hunger that afflict our world:* that is why I join you at this International Symposium. When we share a common commitment to conversation, we should be in a good position to exchange views about concerns we have and positions we take, even when they are at variance.

And yet because the stakes are high, tempers tend to run short, and sharply divergent views make the conversation shrill. When that happens, as Vatican II foresaw, we must courageously go even further and deeper than conversation, into ***dialogue:*** "The Church sincerely professes that all [people], believers and unbelievers alike, ought to work for the rightful betterment of this world in which all alike live; such an ideal cannot be realized, however, apart from sincere and prudent dialogue."[4]

And when you juxtapose the World Food Prize and the Occupy World Food Prize, at first glance the divergence can appear and sound like polar opposition. The urgency of world hunger and food insecurity certainly cries out for "*rightful betterment*", and therefore calls for *dialogue.* And for that I have come, too: to call for conversation and to promote dialogue. The Church promotes listening, *dialogue,* patience, respect for the other, sincerity and even willingness to review one's own opinion. The Church encourages, orients and enriches discussion and debate.[5] It strives to *indicate directions* for the work of those who are technically and politically responsible for dealing with concrete problems.

The Church Converses with the World Food Prize

Let me, then, begin the *conversation:* The earth, as Scriptures tell us, was created as the home of the human family. The earth is beautiful, good and perfect in serving its purpose of giving sustenance to human life. Later, however, the Prophet Isaiah tells us that "*the earth languishes and suffers*"[6] from the sins of its human inhabitants. In view of this pitiful situation, Saint Paul will announce the hope of the earth's redemption, with man who was given custody of it, through Christ.[7]

Entrusted with the custody of the earth, the human family has a mission to love God's creation, to accompany it towards its ultimate perfection, and to make it fruit-

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[1] Vatican II, *Gaudium et Spes,* § 1.
[2] Pope Francis, *Address,* 38th Conference of the Food and Agriculture Organization of the United Nations, 20 June 2013.
[3] Vatican II, *Gaudium et Spes,* § 3.
[4] *Gaudium et Spes,* § 21; cf. § 40.
[5] Cf. Pope Francis, *Audience* for Pontifical Council for Justice and Peace Conference on *Pacem in Terris,* 3.10.2013.
[6] Cf. *Is,* 24, 1–13.
[7] Cf. *Rm,* 8, 21.

ful: a fruitful creation that is to be enjoyed by the present and future generations, and that satisfies all the needs of humanity. That is why Pope Leo XIII says: "*that which is required for the preservation of life, and for life's well-being, is produced in great abundance from the soil, but not until [people have] brought it into cultivation and expended upon it [their] solicitude and skill.*" [8] Similarly, the *Compendium of the Social Teaching of the Church* observes: "*The Christian vision of creation makes a positive judgment on the acceptability of human intervention in nature, which also includes other living beings, and at the same time makes a strong appeal for responsibility*".[9]

In Catholic thought, then, "nature" is neither sacred nor divine, neither to be feared nor to be revered and left untouched. Rather, it is a gift offered by the Creator to the human community to be lived in and used, entrusted to the intelligence and moral responsibility of men and women. Therefore it is legitimate for humans with the correct attitude to intervene in nature and make modifications. In the words of the *Compendium* as applied to biotechnology: "*For this reason the human person does not commit an illicit act when, out of respect for the order, beauty and usefulness of individual living beings and their function in the ecosystem, he intervenes by modifying some of their characteristics or properties.*" [10]

"*Intervening By Modifying*": The Church, Catholic Social Doctrine and Biotechnological Research

There are no *a priori* limits on the notion of "*intervening by modifying*". It does not even preclude actions taken on what may be considered as the most intimate part of living organisms: the *genome.*

Blessed John Paul II, for example, in a speech to the members of the Pontifical Academy of Sciences, expressed support for genetic research, saying: "*It is also to be hoped, with reference to your activities, that the new techniques of modification of the genetic code, in particular cases of genetic or chromosomic diseases, will be a motive of hope for the great number of people affected by those maladies*".

He continued in a similar way about food production, saying: "*Finally, I wish to recall, along with the few cases which I have cited that benefit from biological experimentation, the important advantages that come from the increase of food products and from the formation of new vegetal species for the benefit of all, especially people most in need.*" [11]

Again, addressing the 24th General Assembly of the FAO, where he observed how hostile climate affects food production in poor countries, he said: "*The findings of science must be put to use in order to ensure a high productivity of land in such a way that the local population can secure food and sustenance without destroying nature.*" [12]

Finally, at a study week of the Pontifical Academy of Sciences and the Swedish Academy of Sciences on *Tropical Forest and the Conservation of Species,* John Paul II referred to how "*other plants possess value as sources of food or as a means of genetically improving strains of edible plants.*" [13]

At this point in the conversation, and in the light of the above, we should rejoice in the memory and achievements of Dr. Norman Borlaug: He was awarded the *Nobel Prize* in 1970 in recognition of his lifetime of work to feed the hungry of the world. He struggled endlessly to integrate research and viable technologies into wheat production in Mexico. His work extended from research stations to farmers' fields. In the words of Pope Francis, Dr. Borlaug had '*the smell of the sheep*', or in Iowan farmers' language: "*He had manure on his boots*". The result was called ***the Green Revolution:*** the production of seeds with broad and stable disease resistance, adapted to varying growing conditions and with high yield potential; and he conceived and set up the ***World Food Prize*** to encourage continued work towards food security and to meet the *zero hunger challenge.*

This is also why we have reason today to congratulate our three World Food Prize winners this year: Dr. Marc Van Montagu of Belgium (*http://*

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[8] LEO XIII, *Rerum Novarum,* n. 9.

[9] Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church,* Libreria Editrice Vaticana, Città del Vaticano 2004, § 473.

[10] *Ibid.*

[11] John Paul II, *Address to the Members of the Pontifical Academy of Sciences,* 23.10.1982, §§ 5–6.

[12] John Paul II, *Address to the Participants in the XIV General Assembly of the FAO,* 13.11.1987, § 5.

[13] John Paul II, *Address to the Participants of the Study Week organized by the Pontifical Academy of Sciences,* 18.05.1990, § 2.

*www.worldfoodprize.org/en/laureates/2013_laureates/#Dr._Marc_Van_*),[14] and Dr. Mary-Dell Chilton (*http://www.worldfoodprize.org/en/laureates/2013_laureates/#Dr._Mary-Dell_*)[15] and Dr. Robert T. Fraley (*http://www.worldfoodprize.org/en/laureates/2013_laureates/#Dr._Robert_T._Fraley*)[16] of the United States, and to commend them for carrying on the legacy of Dr. Borlaug, putting biotechnology and research towards improving food production.

But times have also changed: Dr. Borlaug's achievements were greeted with great enthusiasm, and the ***Green Revolution*** with great optimism. Why then is there so much displeasure and distrust today, so much skepticism and strong opposition? Never before, having accepted an invitation, have I received so much mail, some of it urging me to withdraw, a bit of it affirming the value of GMOs, much of it recounting destruction and suffering in relationship with globalized industrial agriculture promoting GMO crops. What can be going wrong, seeing that Pope John Paul spoke positively about such research?

Let me now go back to Pope John Paul II to continue the ***conversation.*** For when he encouraged genetic research to enhance food production, he also clearly stated the *parameters* within which such research may be carried out. "*In terminating these reflections of mine,*" he said to the Pontifical Academy of Sciences, "*which show how much I approve and support your worthy researches, I reaffirm that they must all be subject to moral principles and values, which respect and realize in its fullness the dignity of man.*"[17]

It is clear, then, that in the mind of John Paul II, the various operations that can be called "genetic manipulation" must be the object of a true moral discernment. "*To speak the truth,*" he said on another occasion, "*the expression genetic manipulation is ambiguous.*" While it is characterized by beneficial applications in the area of animal and plant biology, very useful for food production, it can also yield to adventurism.[18] In the latter case, it can be *arbitrary and unjust,* especially when it loses sight of the total well-being of the human person. This is why, for John Paul II, it is absolutely necessary to overcome the separation between science and ethics, and to discover their radical unity.[19]

Accordingly, the desired dialogue will have to go very deep. It will need to include the motivation and vision which guide biological and genetic research and biotechnology—in other words, not only so-called "pure" research but also the vision and motivation that guide its translation into policies, commerce, agriculture and trade in many different situations around the world. And for the dialogue to progress *in good faith,* all the stakeholders must genuinely be represented and meaningfully take part.

The Problem of Food Insecurity

Hunger in the world is a very serious injustice that shows fundamental disrespect for human dignity. Pope John Paul II called it "*the first and fundamental form of poverty*".[20] Persistent hunger, starvation and malnutrition represent a global failure of humanity that, to our shame, has dragged on for decades. It is a plague, and a long-term indicator of a system that does not function properly. Some point to the economic crisis of recent years as the reason why the world cannot do better; but that is just an excuse—food insecurity has persisted for decades, through prosperous times as well as more difficult ones.

But the problem is not, of course, an overall scarcity of food.

Today the world produces more than enough food to feed its seven billion inhabitants, but the world has one billion hungry people (about one in seven), the United States 50 million (about one in six). But much is lost after harvesting or just thrown away: in a very recent document, "*FAO estimates that each year, approximately 1/3 of all food produced for human consumption in the world is lost or wasted*".[21] Some estimates are even higher than 1/3.

Since the 1980s, the Popes, supported by FAO statistics, have pointed out that the supply of food per capita on the planet is steadily increasing. So it is clear that, in large part, hunger is a problem of distribution of food or access to it. It does not reach some people, or they cannot buy it. To others, however, it comes in abundance,

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[14] Founder and Chairman of the Institute of Plant Biotechnology Outreach at Ghent University in Belgium.

[15] Founder and Distinguished Fellow of Syngenta Biotechnology.

[16] Executive Vice President and Chief Technology Officer of Monsanto.

[17] John Paul II, *Address to the Members of the Pontifical Academy of Sciences,* 23.10.1982, § 6.

[18] Cf. John Paul II, *Address to the XXXV General Assembly of the World Medical Association,* 29.10.1983, § 6.

[19] *Idem.*

[20] John Paul II, *Message,* World Food Day 2001, 16.10.2001.

[21] FAO, *Food wastage footprint, Impacts on natural resources. Summary report,* 2013, p. 6.

even from afar—abundant enough that they can waste it.[22] In other cases, finally, the systems for storage of harvests or the supply chains are deficient.

Let me suggest a little parable. A man is anxious to improve the strength of his arms. A surgeon offers to transplant muscles from his legs into his arms: "This will quickly make your arms big and strong". "What will happen to my legs?" the man asks. "They will become much weaker," replies the surgeon, "and may have to be amputated." The man is horrified and rejects the surgeon's solution.

In some circumstances, the promise of food security merely through higher agricultural productivity is similar. New technologies are promoted with the claim of making more food available for everyone. But that is not the whole picture. In reality, the innovations are so designed or implemented as to benefit relatively few interests that are already well-off.

Along the way, many small producers will inevitably be excluded and/or moved off their land. They will be amputated from their traditional occupations and way of life. The uprooting of individuals, families and communities is not only a painful separation from land; it extends to their entire existential and spiritual environment, threatening and at times shattering their few certainties in life.

It should not surprise us if some populations reject certain innovations, not because they are faulty or perceived as such, but because the manner of their delivery entails unbearable costs to those who are supposed to benefit from them. It is not they who are missing the point. Rather, like the surgeon who thinks only of a set of arms, not the whole person, whoever refuses to look at the whole food insecurity picture—people and their dignity and their lives as well as food production and distribution—will miss the point.

How does the Church "know" about world hunger, sustainable agriculture or GMOs? First of all, the Church is in touch with the direct experience of her people. Another important way that we know about these topics is through members of the Church who are scientists or professionals working in a wide variety of positions in universities, government and industry. And a third way would be in the work of different departments of the Roman Curia: the Pontifical Academy for Life, the Pontifical Academy of Science, the Pontifical Academy of Social Science, the Congregation for the Doctrine of the Faith, the Holy See Missions to the World Food Organization and to other international bodies, the Secretariat of State and our own Pontifical Council for Justice and Peace.

In 2004 our Pontifical Council produced a *Compendium of the Social Doctrine of the Church.* Nine of its 583 paragraphs are devoted to biotechnology: not to the science or the industry, but to the ethical criteria that people of good will should apply to the development and use of these technologies. I warmly recommend this text to everyone involved in working on GMOs.[23]

Broad Directions

Here is what I can offer to whoever tries to fight hunger, especially in the field of biotechnologies applied to the agricultural sector. I implore you, your colleagues, and others whom you influence such as your students, to always proceed along an **ethical path of discernment.**

It is common to find some scientists and advocates who strongly hold one position and others who hold its opposite. They attack and even ridicule the opposed views—perhaps not in scientific meetings and journals, but certainly in the media. And all this attack, defense and counter-attack leave the public deeply confused.

There is a different approach, which takes its stand in dialogue, in the patient exchange of positions and objections. When there is something as important to humanity as hunger, and something as controversial as GMOs, let us encourage research under solid (not flimsy) ethical guidelines, and then, sharing the results, let us do so in a climate of listening and dialogue.

We know since *Gaudium et Spes* in the mid-1960s that the Church accompanies science. This is because science cannot proceed without ethics. *Ratio* goes along with *fides,* as Benedict XVI taught so clearly. *Bios,* which means *life,* must be handled ethically and respectfully, and maybe this is especially true with respect to biotechnology. It is hazardous—and ultimately absurd, indeed sinful—to employ biotechnology without the guidance of a deeply responsible ethics. For instance, nearly 50 years ago, Pope Paul VI called for prudence, responsibility and unselfishness in this domain:

> *By dint of intelligent thought and hard work, man gradually uncovers the hidden laws of nature and learns to make better use of natural resources. As he*

[22] Cf. FAO, *Food wastage footprint,* pp. 11–13.
[23] *Compendium of the Social Doctrine of the Church,* §§ 472–480.

*takes control over his way of life, he is stimulated to undertake new investigations and fresh discoveries, to take prudent risks and launch new ventures, to act responsibly and give of himself unselfishly.*[24]

Blessed Pope John Paul II was supportive of research in biotechnology to feed the world. Moreover, when he visited Des Moines in 1979, standing in a corn-bedecked fields, he challenged agriculture in America and around the world to "*foster sustainability of the land and water and plants, and to use the harvest to feed the hungry in the world.*" [25]

The study-document preparing for the II Synod for Africa in 2009 identified the true problems of agriculture in Africa: "the lack of cultivatable land, water, energy, access to credit, agricultural training, local markets, road infrastructures, *etc.*" These true problems should not be overlooked or side-stepped by those who promote the planting of genetically-modified seeding as the definitive solution.[26]

In his important encyclical *Caritas in Veritate of 2009,* Pope Benedict XVI counted food security among the urgent global issues which require "a greater degree of international ordering". He asserted that the problem of food insecurity "needs to be addressed within a long-term perspective, eliminating the structural causes that give rise to it and promoting the agricultural development of poorer countries. This can be done by investing in rural infrastructures, irrigation systems, transport, organization of markets, and in the development and dissemination of agricultural technology that can make the best use of the human, natural and socioeconomic resources that are more readily available at the local level, while guaranteeing their sustainability over the long term as well. All this needs to be accomplished with the involvement of local communities in choices and decisions that affect the use of agricultural land." Having enumerated the many conditions that cry out for improvement, Pope Benedict went on to welcome "the new possibilities that are opening up through proper use of traditional as well as innovative farming techniques, always assuming that these have been judged, after sufficient testing, to be appropriate, respectful of the environment and attentive to the needs of the most deprived peoples".[27]

For Pope Benedict, it is clear that ever-increasing production as the primary path—let alone the sole option—to reducing world hunger is too narrow a vision and can lead to false solutions, which may actually undermine food security in the long term.

Guidelines

I have quoted the recent Popes Paul VI, John Paul II, Benedict XVI and now Pope Francis. Having considered the general directions they laid out, let me now spell out more specific ethical orientations that need to accompany work in science and technology, including biotechnology, as well as international trade and commerce. This is still not a Church position on GMOs as such, but rather, the assistance of the Church in the form of guidance based on her Social Doctrine.

A. **Spirit of courage:** Face up to the reality of hunger decisively and with genuine charity and openness of heart. In the words of Pope Francis: "*Something more can and must be done in order to provide a new stimulus to international activity on behalf of the poor, inspired by something more than mere goodwill or, worse, promises which all too often have not been kept . . . There is a need to move beyond indifference and a tendency to look the other way, and urgently to attend to immediate needs, confident that the fruits of today's work will mature in the future. We cannot devise programs which are bureaucratic and antiseptic, which do not work today.*" Keep on studying the causes of world hunger as broadly and deeply as possible, seeking the greatest variety of possible solutions, since we need "a *complete knowledge of particular situations, suitable preparation, and ideas which take into account every individual and every community.*" [28]

B. **Ethics of all human endeavors:** Some would claim that research is ethically neutral, and only its application or implementation may be good or bad. But any activity which deserves the name "human" requires ethical guidance if it is to serve the common good. Therefore, a researcher always should work

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[24] Paul VI, *Populorum Progressio* § 25.
[25] John Paul II, *Address to the Rural Community of Saint Patrick, Des Moines,* 4.10.1979.
[26] *Instrumentum Laboris of Synod for Africa,* 19.03.2009, § 58.
[27] Benedict XVI, *Caritas in Veritate,* § 67.
[28] Pope Francis, *Address to the 38th Conference of the Food and Agriculture Organization of the United Nations in Rome,* 10.06.2013, §§ 2, 3, 4. For a comprehensive presentation of the principles here mentioned, consult the *Compendium,* especially §§ 472–80.

"*to satisfy the demands of justice, fairness and respect for every human being*";[29] not merely for the sake of profit. The same criteria apply to those who are responsible, in later phases of the process, for industrial production, international trade, commercial distribution, and so forth. There should be no "washing of the hands" at any step along the way.

C. **Prudence:** The full costs and consequences of introducing genetically modified organisms may emerge only with time, in the long-term. Therefore let us apply the *principle of precaution* or *prudence* by taking every reasonable measure of caution beforehand, to avoid the risk of damaging human health or the environment. Such prudence, I might add, is a necessary element of any effort to advance the common good through public, that is governmental, action.

D. **Transparency:** Adopt the highest standards of communication with the public, as well as rules of labeling in order to guarantee producers' and consumers' right to information. This is necessary for everyone to have a true choice. This is the *principle of* ***transparency.***

E. **Access:** Patents and intellectual property rights are legitimate, but they need to be monitored and regulated. Fair ways must be found to share the fruits of research and ensure that developing countries have *access* both to natural resources and to innovations. Otherwise whole populations can be discriminated against, exploited and deprived of what they rightly should have a share in.[30]

F. **Biodiversity:** Bio-diversity is humanity's patrimony. It needs to be protected, indeed privileged. The development of new types should not require, or lead to, the disappearance of traditional species.

G. **Subsidiarity:** A very healthy principle of Catholic Social Teaching is subsidiarity, which favors the exercise of responsibility at every level and resists "top-down" approaches where inappropriate. It is often better to support local efforts than to provide or even impose solutions from elsewhere. And given the complexities of globalization, effective **coordination** of efforts at all levels is also increasingly required.

H. **Commerce:** Analyze, condemn and fight "*financial speculation, which presently affects the price of food, treating it like any other merchandise and overlooking its primary function.*" Abandon any form of "*short-sighted economic interests and the mentality of power of a relative few who exclude the majority of the world's peoples, generating poverty and marginalization and causing a breakdown in society.*"[31] And educate our youth to do the same. . . . with *criteria of justice and solidarity* governing the commercial and economic conditions, avoiding any commercial-economic monopoly

I. Finally, **conversation and dialogue.** Sharp differences of opinion (*e.g.,* between WFP and "Occupy") about agriculture and biotechnology show how important are these issues. Their importance does not justify harshness (polemic) or manipulation (bullying). At every level from the global to the local, one might ask, what should be people's input into research, agricultural and trade policies, development policies, funding priorities, and so forth. *"Every proposal must involve everyone,"* Pope Francis insists. *"To move forward constructively and fruitfully in the different functions and responsibilities involves the ability to analyze, understand, and engage, leaving behind the temptations of power, wealth or self-interest and instead serving the human family, especially the needy and those suffering from hunger and malnutrition."*[32]

I will stop here. There may be other desirable or even essential criteria for serious, realistic, honest and courageous dialogue on this topic. If so, let them be put on the table. For the diverse parties to participate in good faith, they must hold themselves as well as others to such criteria. The world needs everyone, the heirs of Bishop Maurice Dingman and the heirs of Dr. Norman Borlaug, to stay at the table and solve these issues, rather than abandon the dialogue and leave the world's poor at an empty table.

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[29] Pope Francis, *FAO,* § 1.
[30] Cf. *Statement of the Holy See at the World Trade Organization Council on Trade-Related Aspects of Intellectual Property Rights,* Geneva, 8 June 2010, §§ 5–7.
[31] Pope Francis, *FAO,* § 2.
[32] Pope Francis, *FAO,* § 3.

Conclusion

The world's food security challenges are not to be overcome with a referendum on science. Scientific research is good. It is right to celebrate the achievements of our three World Food Prize Laureates. The Church is not anti-science.[33] Nor do we wish to promote a referendum on technology or biotechnology. Nor even a referendum on business—the Church is not against business or the market. In fact, while we have critiqued some aspects of the world financial system—inattention to the common good, disrespect for the rights of weaker members, tolerance for monopolies and cartels—my Council has sponsored a major publication that encourages the vocation of business leaders in carrying out God's plan for humanity.[34]

The Church sees the GMO debate as a complex choice among various means—the means offered by advances in biotechnology and by innovations in agriculture, as well as the human, natural and socioeconomic means which can be developed locally and regionally. Among the goals we embrace are food security for all, quality of life of land-based populations, biodiversity and long-term sustainability. We see many sides to the coin of "world food".

So we wish to promote meaningful dialogue amongst the stakeholders, whether in the United States or in other parts of the world. All sides of the controversy are using many of the same key phrases such as "overcoming hunger" and "sustainable agriculture", thus it will only be by mutual and respectful listening, by a genuine desire to learn from the other, indeed from all the stakeholders, that the better and truly enduring, sustainable solutions will be found. May I cite my own African experience of "palaver"? Palaver is the extremely patient and thorough exploration of a whole problem until one reaches consensus. It means to talk and to talk, to listen and listen, thoroughly to explore every facet of a complex issue, with mutual respect and without hostility. Sooner or later, a truly consensual conclusion will arise. But in order to find the best way forward, ALL the stakeholders must be represented around the palaver circle—a circle characterized by humble and respectful listening, honest speaking, reconciliation of deep differences—a circle of true collaboration.

Thank you for allowing me, in the name of the Church as convener and teacher, to offer to facilitate some of the needed dialogue.

Cardinal PETER K.A. TURKSON,
*President,* Pontifical Council for Justice and Peace.

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SUPPLEMENTARY MATERIAL SUBMITTED BY NINA V. FEDOROFF, PH.D., OLSSON FRANK WEEDA TERMAN MATZ PC (OFW LAW)

Hon. K. MICHAEL CONAWAY,
*Chairman,*
House Committee on Agriculture,
Washington, D.C.;

Hon. COLLIN C. PETERSON,
*Ranking Minority Member,*
House Committee on Agriculture,
Washington, D.C.

Dear Chairman Conaway and Mr. Peterson:

Thank you, again, for the opportunity to testify on the importance of biotechnology the potentially detrimental impacts of mandatory GMO labeling. I really appreciated your questions and the interaction with the Members. As several questions pertained to the recent glyphosate study conducted by the International Agency for Research on Cancer (IARC), please allow me to provide some materials for the record and supplement my response. Glyphosate is the world's most widely produced herbicide. Hence, the great interest in this chemical.

The IARC concluded that glyphosate is a probable carcinogen to humans, yet noted there is limited evidence of such a link and, as I mentioned at the hearing, the study does not contain any new research. Moreover, the report contradicts the overwhelming consensus by the world's most respected regulatory authorities and

[33] Far from it—where would genetics be without the contribution of the Augustinian friar Gregor Mendel, where would pharmaceutical knowledge be without the herbalists in countless monastery gardens!

[34] Pontifical Council for Justice and Peace, *Vocation of the Business Leader: A Reflection.* First published in 2011 and now available in about a dozen languages, the handbook can be downloaded at *http://www.iustitiaetpax.va/content/giustiziaepace/it/archivio/pubblicazioni/vocation-of-the-business-leader--a-reflection-.html.*

scientific organizations, and the preponderance of all evidence where glyphosate has been found not to present a carcinogenic risk to humans.

- First, and foremost, the IARC results contradict conclusions reached by the Joint Meeting on Pesticide Residues (the Meeting), which is an internationally recognized expert body administered jointly by the United Nations Food and Agriculture Organization and IARC's parent body, the World Health Organization (WHO). "In view of the absence of a carcinogenic potential in animals and the lack of genotoxicity in standard tests, the Meeting concluded that glyphosate is unlikely to pose a carcinogenic risk to humans." *Joint Meeting of the FAO Panel of Experts on Pesticides Residues in Food and the Environment and the WHO Core Assessment Group, Rome, Italy 20–29 September 2004.*
- In 2013, the U.S. Environmental Protection Agency (EPA) "concluded that glyphosate does not pose a cancer risk to humans" and "Therefore, a dietary exposure assessment for the purpose of assessing cancer risk is unnecessary." *2013* ***Federal Register*** Notice (*FR 25396, Vol. 78, No. 84, May 1, 2013*). The EPA is also conducting a comprehensive re-review, which all chemicals go through every fifteen years, and will consider all new information that is scientifically based.
- Germany's Federal Institute for Risk Assessment (BfR), acting as Rapporteur Member State for the European Union's renewal of approval for glyphosate, found that "In epidemiological studies in humans, there was no evidence of carcinogenicity and there were no effects on fertility, reproduction and development of neurotoxicity that might be attributed to glyphosate." *Glyphosate Renewal Assessment Report, Germany as Rapporteur Member State for the European Renewal of Approval for Glyphosate (2015)* IARC's classification, therefore, came as a "surprise" to BfR given Germany's findings were based on "the most comprehensive toxicological database, presumably worldwide, for glyphosate. This database comprises hundreds of studies that were performed by or on behalf of the many manufacturers of glyphosate and thousands of references from the open literature. This huge amount of data makes glyphosate nearly unique among the active substances in plant protection product. BfR thinks that the entire database must be taken into account for toxicological evaluation and risk assessment of a substance and not merely a more or less arbitrary selection of studies." *Germany Federal Institute for Risk Assessment's Response to the IARC, BfR Communication No 007/2015, 23 March 2015.*
- According to the Australian Pesticides and Veterinary Medicines Authority, "The APVMA currently has no data before it suggesting that glyphosate products registered in Australia and used according to label instructions present any unacceptable risks to human health, the environment and trade . . . The weight and strength of evidence shows that glyphosate is not genotoxic, carcinogenic or neurotoxic." *Australian Government, Australian Pesticides and Veterinary Medicines Authority (2013).*
- The Argentine Interdisciplinary Scientific Council found that "The epidemiological studies reviewed showed no correlation between exposure to glyphosate and cancer incidence, nor adverse effects on reproduction, or Hyperactive-Attention Deficit Disorder in children. It is estimated that no significant risks would exist for human health regarding adverse effects on the genetic material. Under responsible use conditions for this herbicide, the intake of food and water would not imply risks for human health." "*Evaluación De La Informacion Cientifica Vinculada Al Glifosato En Su Incidencia Sobre La Alud Humana Y El Ambiente," ("Assessment of scientific information related to glyphosate and its incidence on human health and the environment") (2009).*
- The Canadian Pest Management Regulatory Agency reported that "Health and Welfare Canada has reviewed the glyphosate toxicology database, which is considered to be complete . . . The submitted studies contain no evidence that glyphosate causes mutations, birth defects or cancer." *Doliner L.H. (1991) Pre-Harvest use of glyphosate herbicide [Preharvest application of glyphosate (Roundup) herbicide]. Discussion Document D91–01. 98 pp. Pesticide Information Division, Plant Industry Directorate, Agriculture Canada.*

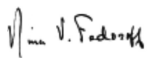
On reviewing all of the available data, both published and unpublished, regulatory authorities have consistently concluded that glyphosate does not cause cancer in either animals or humans.

In short, Mr. Chairman and Mr. Peterson, while I respect the WHO–IARC, its report needs to be put in context. The IARC looks at whether a substance has the potential to cause cancer, rather than the probability it will considering the way it's used in the real world. Furthermore, the IARC's recent conclusions appear to be the

result of an incomplete data review that has omitted key evidence, and so needs to be treated with a significant degree of caution, particularly in light of the wealth of independent evidence demonstrating the safety of glyphosate.

Thank you, again, for this opportunity, and I remain available to the Committee at any time.

Sincerely,



Dr. NINA FEDOROFF.

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SUBMITTED LETTER BY SCOTT MCGINTY, PRESIDENT, AURORA ORGANIC DAIRY

March 24, 2015

Hon. K. MICHAEL CONAWAY,
*Chairman,*
House Committee on Agriculture,
Washington, D.C.

Dear Chairman Conaway,

Aurora Organic Dairy is a leading supplier of USDA certified organic milk to retailers nationwide. We operate farms in Colorado and Texas, including a 3,000 acre farm in Erath County near Dublin, TX. Established only 10 years ago, we employ over 500 people and market milk from 25,000 cows thanks to strong demand for our products. These herds consume roughly 70,000 acres worth of organic crops, giving rural families the opportunity to participate in a growing sector of American agriculture.

Consumers buy our products at leading mainstream grocers across America, including Kroger, Costco, Walmart, BJs, Safeway, Giant and many others. They buy organic milk because of the rigorous production and monitoring practices required by the National Organic Program (NOP) and they trust the USDA organic seal as a symbol of its certification. This law strictly prohibits the use of synthetics such as antibiotics, pesticides, herbicides, unapproved synthetics and genetically modified organisms (GMOs) in the production of certified organic food. In organic milk, this prohibition explicitly applies to the production of the feed. In fact, for milk to be certified organic, each feed ingredient in the animal's ration requires its own organic certificate to verify production under these standards. Furthermore, each of these USDA organic requirements adds significantly to the cost of our company's milk production.

In turn, organic milk is frequently labeled with the specific attributes of the USDA NOP rule to convey that the product is certified organic. Common claims found on USDA organic milk are "produced without the use of GMOs", "produced without GMO ingredients", and "produced without synthetic pesticides or growth hormones." Consumers buy this milk because they trust that these are not used anywhere in the production of the product—not on the farm, not in the feed, and not in the cow.

As stated above, the law requires organic producers to make very large investments during conversion from conventional farms to organic farms. Then, organic producers spend a great deal more to produce organic food. Because certified organic feed costs so much and because being organic means lower yields from organic farms and cows, the cost of organic production per gallon of milk can be twice as much as conventionally produced milk. In Aurora Organic Dairy's business, this amounts to more than $50 million spent each year to comply with the law on top of the estimated $80 million in one-time organic conversion costs. The organic industry as a whole spends billions in incremental production costs to comply with the USDA NOP in order to deliver certified organic food to American families.

Given your consideration of biotechnology and GMO labeling legislation, we ask the Committee to recognize that any requirements for non GMO production under the NOP be extended to any new non GMO definitions. Non-GMO production has been defined in the consumer marketplace in accordance with the USDA's organic program and the term should have the identical meaning under any new program. Any non-GMO labeling claim on milk should mean a complete prohibition of GMO feed use for consistency with NOP requirements. American families would expect nothing less.

With the consumer in mind, we must avoid the confusion of inconsistent non-GMO meanings on labels. Given consumer sentiment for food transparency today,

a conflicting non-GMO milk definition allowing GMO feed or other inputs would result in harsh consumer criticism and represent a large step backwards.

For farmers, it is equally important that any non GMO requirements under one USDA program are the same as non GMO requirements under any other under the USDA or the Food and Drug Administration (FDA). To allow otherwise, would create a double standard and enable conventional milk producers using GMO feed to ride on the coattails and pocketbooks of certified organic farmers. A large class of producers would suffer severe economic loss as a result.

We also believe that the introduction of a second USDA label for non-GMO food would result in consumer confusion with the existing USDA organic program and be a waste of scarce taxpayer dollars. As the recent farm bill process clearly showed, there is hardly enough funding for existing agriculture programs without creating new ones that duplicate efforts.

To be clear, we do not oppose the use of biotechnology in food or the effort by Congress to create national labeling standards. It is very important labeling laws avoid unnecessary barriers to interstate commerce. We believe in creating choices for consumers and agricultural producers and applaud your support of USDA programs that stimulate such choices and expand the economic opportunities for the American farmer. For these programs to be trusted by their participants and American families, the definition of non-GMO and its associated labeling claims should remain free of any inconsistency.

To put this idea into a real context, imagine a young mother at the grocery store. She is pushing a stroller, buying groceries for her family at home and the toddler who is looking up at her from below. With a glance at her shopping list, she says to herself "frozen pizza, diapers, and a gallon of milk:" Smiling at her baby, she remembers how she had avoided the pizza before she stopped nursing. She reaches the milk section and comes across two brands; one of them is the organic item she normally buys. The prices are quite a bit different so she looks closer and sees that "non-GMO" is printed on both labels. She thinks to herself, "I'd love to save a couple dollars. Since they're both made without GMOs, I think I will."

Now ask yourself, would she know that the two GMO claims have different definitions? Would she feel deceived to learn that the milk she bought was produced using GMO feed? Our law-making decisions must eliminate the potential for this sort of consumer deception.

For these reasons, we submit that H.R. 4432, as introduced in 2014, would in fact create a double standard for the labeling of milk, undermine existing organic law and mislead consumers. Its provisions under section 103 clearly allow milk products produced with GMO feed to be labeled "non-GMO." This definition of such a claim under any legislation would directly conflict with the definition of the term under the existing organic program. We strongly urge the Committee to consider this consequence and amend the language to preserve consistency with current law.

We are grateful for the opportunity to submit this letter to the hearing record and thank you for considering our comments. We look forward to working with you and the Committee over the coming months during this review of mandatory biotechnology laws in agricultural production.

Sincerely,

Aurora Organic Dairy

SCOTT MCGINTY,
*President.*

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SUBMITTED QUESTIONS

**Response from Nina V. Fedoroff, Ph.D., Senior Science Advisor, Olsson Frank Weeda Terman Matz PC (OFW Law)**

*Question Submitted by Hon. David Rouzer, a Representative in Congress from North Carolina*

*Question.* Dr. Nina Fedoroff, thank you for the information you presented. Biotechnology is such a useful tool in the daily lives of the public, even if they don't realize it. Genetic engineering helps to diagnose, treat, and prevent diseases, such as cancer, arthritis, diabetes, cystic fibrosis, sickle cell anemia, multiple sclerosis, cardiovascular disease, Hepatitis B, meningitis, and whooping cough.

With that said, we hear from opponents to biotechnology that the science is making natural plants unsafe. I would like to ask you about poisonous, unsafe plants found in nature that science has been able to modify into useful, safe tools that benefit people's health. I can think of a few examples: chemicals found in the Rosy periwinkle have been isolated and used in chemotherapy treatments; chemicals in the black henbanehas have been isolated and used in prescription drugs targeting muscle spasms and symptoms of Parkinson's disease; and foxglove's chemicals are used in medicines for people with congestive heart failure.

Can you please speak to any further examples you have of biotechnology helping in this way? Also, can you please speak to how this public shaming of biotechnology is putting these advancements of science in danger?

*Questions Submitted by Hon. Dan Newhouse, a Representative in Congress from Washington*

*Question 1.* Can you briefly explain what benefits we could experience from a nutrition, food safety, and efficiency standpoint by using biotechnology? Also, do you believe publicly shaming or generating a culture of fear around these products jeopardizes their possible benefits?

*Question 2.* Dr. Federoff, given the nature of the targeted, specific modifications that this technology uses, do you believe we actually know significantly more about the final, modified product in these instances than we might know with conventional breeding?

*Question 3.* Dr. Federoff, in your experience, are plants that have been genetically modified using modern biotechnology materially different from their non-genetically modified counterparts?

*Question 4.* So based on that assessment, should the FDA distinguish and regulate crops or livestock based on the method of modification or the material composition and why? Also, if you had to speculate, how difficult would it be for a farmer in the field to distinguish between a modified seed and a non-modified seed? Would a worker in a grocery store be able to tell the difference between a non-modified ear of corn and a modified one?

*Answers*.*

Medical Benefits

There are more than a hundred compounds originally derived from plants that are currently used as drugs in one or more countries. The following website has an excellent table that lists the chemicals, their clinical uses and their plant sources: *http://www.rain-tree.com/plantdrugs.htm*.

However, today's new drugs are increasingly proteins produced through GM technology (also known as "recombinant DNA" technology). That is, our knowledge of genes and proteins has advanced to the point that we can make human proteins in large amounts in either cultured cells or in lower organisms, such as yeast and bacteria. The classic example is human insulin. Before GM technology, insulin was largely derived from pigs and often had adverse effects in humans. Today's insulin is human insulin produced in microorganisms through GM technology. Other widely used human proteins produced in microorganisms are human growth hormone, clotting factors for treatment of hemophilia, and proteins used in vaccines.

Nutrition, Food Safety, Agricultural Efficiency

Many of the plants we use for food have a long history of genetic modification to make them more suitable as food plants by making them less toxic (potatoes, for example, contain toxic glycoalkaloids), easier to grow and harvest (bigger, softer grains that stick to the plant until harvest), and more appealing to eat (bigger, redder, sweeter fruits and vegetables). This is called domestication and much of it happened before we understood genes and genetics. But in the 20th century, growing knowledge of genetics was put to work in plant breeding by employing such scattershot methods of accelerating genetic change as chemical and radiation mutagenesis. About half of the crops on the market today have such a mutagenesis step in their history. Genetic modification by modern molecular methods, what we now call GM or GE, is just starting to be used to make nutritional improvements, although the Bt corn that is now grown very widely makes corn safer by decreasing contamination by fungal toxins (fungi get into the corn through holes bored by insects. No holes, no fungi, no toxins).

GM foods in the pipeline that will offer advantages through improved nutrition or decreased waste include oils with omega-3 fatty acids, apples that don't turn

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* **Editor's note:** the witness did not differentiate the submitted responses; therefore they are printed as received.

brown when cut, potatoes that have lower levels of a natural amino acid that turns into the toxic compound acrylamide when the potatoes are fried in hot oil, and non-allergenic peanuts.

However, perhaps the most important accomplishments of GM technology have been, and will continue to be, in making it possible to continue increasing the productivity of our (and our animals') primary calorie sources (corn, soybeans, wheat, rice, canola) while decreasing the environmental footprint of agriculture and making it more sustainable by decreasing the use of toxic chemicals to control pests. In this regard, the 18 year history of current GM crops has been exemplary. As I reported in my initial testimony, a recent meta-analysis revealed that GM crop adoption has increased yields by 22% and farmers' profits by 68%, while reducing pesticide use by 37%. GM crops have also been a major factor in decreasing topsoil loss by facilitating no-till farming.

Safety of GM Techniques

The current, highly conservative regulatory process was developed when little was known about the health and environmental impacts of GMOs. Today, we have more than a quarter century's research on GM biosafety, all of which shows that modification of organisms by GM techniques is as safe as modification by older techniques and arguably safer. Indeed, a number of recent studies have revealed that there is much less genetic and epigenetic disturbance when plants are modified by adding a gene than when they are modified through older techniques such as genetic crosses (aka cross-breeding) or through either chemical or radiation mutagenesis. This is because the older techniques either bring together thousands of genes for the first time or cause damage that can reverberate through the genome, while GM technology can introduce just one or a small number of genes without disturbing the genome in general.

What We Know About Today's GMOs

In addition to the fact that GM techniques cause less genetic disturbance than older techniques, the GM crops currently on the market are the most extensively studied crops ever to have entered our food chain. This is in part because analytical techniques have improved with the widespread development and use of techniques that allow monitoring of all genes, gene expression levels, proteins and metabolites. It is also because the current regulatory requirements are focused only on crops modified by GM technology and require that the developer demonstrate that the plant is substantially equivalent to the parent plant and that the substance to be expressed in the GM plant be neither toxic nor allergenic. That has never been required for a crop developed using any previous genetic modification technique, including radiation and chemical mutagenesis. Thus the answer to the question about whether a crop modified by modern biotechnology is materially different from its non-genetically modified counterpart is simply: no. They must be shown to differ just in the added component and that added component must be shown to be safe. That said, it must be kept in mind that biological organisms are constantly changing genetically, people included. So substantial equivalence does not mean genetic identity.

Should Regulation By FDA (and USDA and EPA) Be Process-Based?

More than 3 decades of biosafety research have failed to identify a hazard unique to the use of modern GM techniques. Indeed, there is growing evidence that modification of organisms by modern GM techniques is less disruptive of genomic structure and function than older methods. This means that regulation of organisms based on the modification method is simply unwarranted. **Genetically modified organisms should be regulated based on their properties, not on the method of modification.**

The GM crops on the market today look identical to and are nutritionally equivalent to their non-GM counterparts. Thus neither a farmer nor a grocery store clerk could distinguish any of today's GM crops from their non-GM equivalents by their appearance. Certain identification requires a still-costly molecular test.

GMO Shaming

The issue of GMO shaming, which is better described as vilification, is already serious and potentially calamitous. It is now standing firmly in the way of easing the regulatory burden on plants and animals improved through GM techniques, as the anti-GMO clamor tends to slow down decision-making in the regulatory agencies, in part out of fear of litigation. To give just one example of the slow and cumbersome regulatory process, the GM Aquabounty salmon, genetically identical to its wild progenitor except that it grows faster (and no, it is not a threat to wild salmon as it will be produced as sterile females only) has been in the regulatory approval

process for more than a decade. The company has complied with all of the FDA's requirements, but the agency has simply failed to issue a decision, well past its own decision timeline. Developers have experienced similar prolonged decision-making stretching to years in the other agencies, the USDA and the EPA, that regulate GMOs.

Why is the shaming/vilification of GMOs potentially calamitous? In the larger scheme of the world's food supply, our population growth rate is now clearly exceeding the rate at which agricultural productivity is increasing. The extraordinary agricultural advances of the 20th century have put humanity in a position to supply the entire world's population with an adequate diet today, despite the rapid growth of the human population over the previous century. Today's hunger is the result of poverty, not an inadequate global food supply. But productivity increases are lagging, the population continues to grow, and climate warming is beginning to have a negative impact on agriculture globally. Without the innovations, amongst which the continued improvement of crop plants is arguably the most important, we face a future of increased food-based strife.

Today there is a small, but extremely vocal and influential anti-GMO lobby in the U.S., comprising individuals such as the self-proclaimed expert Jeffrey Smith, organizations such as Greenpeace and the organic food industry's marketers. These use any and all available scare tactics to vilify GMOs (and conventional agriculture in general) in order to maintain their revenue streams and, in the case of the organic food industry, to increase their market share. The preponderance of companies and public sector researchers developing GM crops are U.S.-based today. The objectives of the anti-GMO organizations and the organic food industry are to drive all GM foods off the market and convert U.S. agriculture to "organic." Success in this endeavor could drive the major biotech industry players out of crop improvement using GM techniques and is already creating an almost complete impediment to public sector crop improvement using these techniques because of the high cost of complying with the complex regulatory requirements. This would compromise—and could even terminally cripple—the world's efforts to achieve food security and make agriculture sustainable. Hungry people bring down governments, as we've already seen in recent food price spikes.

**Response from Joanna S. Lidback, Owner, The Farm at Wheeler Mountain, Westmore, VT; on behalf of Agri-Mark; National Council of Farmer Cooperatives; National Milk Producers Federation**

*Question Submitted by Hon. Dan Newhouse, a Representative in Congress from Washington*

*Question.* Ms. Lidback, I'm a farmer myself and my state nearly adopted a similar law to what Vermont is preparing to impose, so I can deeply appreciate where you're coming from. How do you believe it might impact your business if neighboring states like New Hampshire, or New York, or varying municipalities throughout the Northeast adopt mandatory, though inconsistent, labeling laws from each other?

*Answer.* Thanks for your question, Representative Newhouse. We often work closely with folks in neighboring states. New England is a relatively small area and it's very easy to cross state borders for everyday tasks. In fact, we choose to have our Jersey beef processed at a USDA facility *versus* state-certified so that we can bring our meat to other states to sell it, should the opportunity arise. A state-certified facility would only allow us to sell within Vermont. If each state had its own law that was different than the others, it would pile on regulations thereby increasing regulatory burden—burden we already face in other areas where quite frankly, it is more warranted such as water quality, food safety and labor management. We know currently if the Vermont law is put into place, dairy products and meat would be exempt from a label but we are not guaranteed that same consideration in other states' laws. I believe it is important for farmers and others to share their hands on experience with genetically engineered crops with the general public so as to diffuse the stigma that has been placed upon them from a very vocal minority. Increased costs associated with a patchwork of biotech labeling laws would be felt most by those who can least afford it. The potential unintended consequences of these laws would be numerous.

**Response from Lynn Clarkson, President and Founder, Clarkson Grain Company, Inc.**

*Question Submitted by Hon. Dan Newhouse, a Representative in Congress from Washington*

*Question.* Mr. Clarkson, from your testimony it appears you support a voluntary, standardized labeling regime, and your support for this policy stems from your expe-

rience with the emergence of foods being labeled as "organic" by producers. Can you tell me a bit more about your experience with the "organic" label, and how that has influenced your perspective regarding the need for a labeling standard?

*Answer.* Clarkson Grain began merchandising certified organic products in 1994 at the request of a few organic farmers in Illinois seeking better market access. At that time, there was no one national standard for organic certification. Instead there were several private groups and some states each certifying producers, handlers, and processors to their own standard. Each state and each group claimed that their standard was better than the others. That left buyers, handlers and farmers all confused about which certifier to use. Certifiers began competing with each other for business, some loosening standards to attract farmers and handlers, others tightening standards to attract more consumers. The grand challenge was to select the right certification to match successful marketing passage through the entire supply chain to the consumer. There were continual meetings as certifiers tried to respond to pressure to harmonize their standard. Since each wished to be unique, such efforts to standardize the standards never seemed to work. Some certifiers failed due to internal dissension or competitive pressure, throwing those who had chosen that certifier into disarray and exclusion from markets. Finally, the pressure to develop a national standard finally bore fruit thanks to the lead of the USDA. Contrary to the fears of those long championing organic production, the standards proposed and amended by the USDA satisfied almost everyone—farmers, handlers, processors, retailers and consumers. The openness of the regulations to citizen inputs allowed for an evolution in the rules. Finally, one national standard managed and enforced by the USDA helped organize supply chains that had the confidence of the consumer. Once that national standard came into place symbolized by the USDA's organic label, the organic market soared, even growing during the recession. It continues to grow with all associated players knowing in significant detail what the rules require.

Clarkson Grain has also been supplying non-GMO corn and soy to buyers since 1994. Initial demand came from clients in Japan. Unfortunately there is no clear GMO standard. The same confusion that troubled organic markets before our national community defined "organic" now plagues non-GMO markets—domestic and international. Some of our international clients have abandoned the U.S. as a supplier of non-GMO corn and soy because there has been no government effort to standardize the meaning of non-GMO or support labeling, either voluntary or mandatory. There are already at least two private certifiers of non-GMO with a host of states considering standards, standards that vary by certifier. The largest private certifier lacks the resources to handle national and international demand and suffers internal conflicts as to its own standards. These markets would be significantly rationalized and improved if there were a single national standard managed by the USDA. Such a standard would support a label in which buyers and suppliers could have confidence.

Should the label be mandatory or voluntary? Clearly some advocate mandatory labeling of any food containing GMOs. If the underlying consumer interest to be protected is the opportunity to choose non-GMO products, then voluntary labeling of non-GMO products to a known standard would certainly respect that choice. Targeted voluntary labeling would also be much less intrusive than mandatory labeling of almost every product in the grocery store. Since those currently offering non-GMO as well as those wanting to offer non-GMO products intend to label for market advantage, there would be no unnecessary labeling costs. In my opinion, a national standard linked to voluntary labeling would meet consumer needs and facilitate markets without any unnecessary costs. A labeling program backed by the USDA with tolerance levels openly established to meet consumer values would inspire more confidence throughout the supply chain and among consumes than competing labels offered by various private groups and government entities.

**Response from Thomas W. Dempsey, Jr., President and Chief Executive Officer, Snack Food Association**

*Question Submitted by Hon. Dan Newhouse, a Representative in Congress from Washington*

*Question.* My home State of Washington narrowly defeated a mandatory labeling ballot initiative in 2013. However, many other states and municipalities have since passed initiatives, all of course with different definitions, standards, and labeling requirements from each other. Mr. Dempsey and Mr. Policinski—can you both briefly describe what your companies or member companies would experience if this trend continues? How would producers comply with a conflicting patchwork of state and local labeling and production requirements?

*Answer.* First, I would like to again thank the House Agriculture Committee for providing a forum for a balanced review of one of the most critical issues facing the food industry today, the labeling of genetically modified organisms (GMOs). The Snack Food Association represents more than 400 companies who produce a wide variety of snacks ranging from potato chips, to meat snacks, to crackers, to dried fruit and nut mixtures. SFA members range from billion-dollar multi-category companies such as Frito Lay and ConAgra Foods which have manufacturing facilities in Washington, to small family owned and operated businesses. More than half of SFA members have less than $100M/year in sales and many are the primary employer in their community.

SFA is concerned both with the burden state-level GMO labeling would put on interstate commerce as well as the increased costs that could drive food companies out of business or increase food prices for consumers while potentially limiting their options in the marketplace.

Over the last several years there have been a number of state ballot initiatives calling for mandatory GMO labeling. While voters have rejected ballot initiatives calling for mandatory GMO labeling in four states including Washington, the Vermont state legislature approved the nation's first mandatory GMO labeling law, Act 120, last year. In addition, since January 2015, more than 20 states have introduced nearly 70 different pieces of legislation calling for some type of mandatory GMO labeling. If enacted, these rules would impact nearly every aspect of SFA members' business, upping costs by requiring increased product inventory, added complexity for packaging and distribution processes, and extensive new regulatory and training requirements.

As I mentioned during my testimony, the hardest hit by these new burdens would be the small, family-owned companies with just one plant with just a single line of production. Quite frankly, these costs could put some companies out of business and thereby increase consolidation in the industry. SFA does not have a single member company that manufactures, distributes, and sells in just one state, which adds additional layers of complexity if differing laws were enacted in multiple states.

In order to avoid the need for duplicate labels, it is sometimes assumed that companies could simply remove the GMO ingredients from their products altogether. This is unrealistic because the availability of non-GMO crops is very limited. One SFA member indicated that they could not increase contracts for non-GMO corn for a minimum of 2 years. Transitioning to GMO-free production could not happen overnight, or even by 2016, as is specified in Vermont's Act 120.

Some food manufacturers may be forced to end the distribution of their products in states that require mandatory GMO labeling. This would have a ripple effect across the distribution chain, impacting drivers, warehouse personnel, account executives, and field management. And while consumers in some states, such as Vermont, may have the option to cross state lines to shop for goods if products were pulled from grocery shelves, however that is simply not feasible for everyone. Additionally, if product made its way onto the store shelves, despite a manufactures desire to cease distribution, the manufacturer, in the case of the Vermont law would be held liable, not the retailer.

We agree with you that a national standard for GMO labeling—rather than a state-by-state patchwork of arbitrary rules—is the best approach. Absent a Federal GMO solution, manufacturers will have essentially three options in order to comply with a patchwork of state labeling laws. Those choices would be to order new packaging for products, reformulate products so no labeling is required, or halt sales to that state. As I have outlined, each option is difficult, costly, time-intensive, and at worst, could eliminate jobs and consumer choice in the marketplace.

For all of these reasons, I would also like to thank you Rep. Newhouse for your leadership in supporting critical bipartisan legislation, the Safe and Accurate Food Labeling Act of 2015 (H.R. 1599) which represents a dramatic step in the right direction to address the problems associated with mandatory GMO labeling. SFA's members appreciate that H.R.1599 balances the desire of some consumers for an additional label with the recognition that mandatory labels should be reserved for safety and nutrition concerns. Experts agree that the safety of GMO products is not a concern. The safety of GMOs is backed by FDA, USDA, EPA and 20 years of experience in the field.

Again, thank you for your consideration of our views. We hope this lays the groundwork for a Federal solution to the threat of a costly and confusing patchwork

of state labeling rules. SFA would be happy to be a resource should you have any additional questions.

Sincerely,

TOM DEMPSEY,
*President and CEO,*
Snack Food Association.

**Response from Chris Policinski, President and Chief Executive Officer, Land O' Lakes, Inc.**

*Question Submitted by Hon. Dan Newhouse, a Representative in Congress from Washington*

*Question.* My home State of Washington narrowly defeated a mandatory labeling ballot initiative in 2013. However, many other states and municipalities have since passed initiatives, all of course with different definitions, standards, and labeling requirements from each other. Mr. Dempsey and Mr. Policinski—can you both briefly describe what your companies or member companies would experience if this trend continues? How would producers comply with a conflicting patchwork of state and local labeling and production requirements?

*Answer.* Our farmers have embraced biotechnology faster than any technology in history. They've done that because of the benefits to their economics on farm, the environment, less land and water use, and less crop protection products used. Simply put, they are safe, and beneficial. Stigmatizing GMO foods through a patchwork of state labeling mandates, or even mandatory federal labeling, jeopardizes innovation and threatens the future development and use of technology in agriculture and the availability of these tools to our growers. The challenges from a food industry perspective are no less significant than those faced on the farm. Each state where mandatory labeling legislation is pending has a different labeling requirement. For example, in Washington State the ballot initiative would have required products that contain any ingredients grown from biotech seeds as "partially produced with genetic engineering" or "may be partially produced with genetic engineering." Meanwhile, proposed legislation in other states would require labels to say "contains genetically engineered ingredients." Additionally, the state regulatory body charged with drafting and enforcing these standards also varies depending on the state legislature, as does the scope of food products covered or exempted and the penalties imposed. The three choices we see under a state-by-state regulatory scheme are: (1) to stop selling in the state, (2) to relabel our products at considerable expense, and (3) to re-engineer our supply chain and reformulate our products at even greater expense. None of those are good choices. All of those choices would result in either denying consumer's access to products or raise consumer costs. According to a Cornell University study, families may pay up to an average of $500 per year more per year in food costs due to mandatory labeling. That's why we strongly support a voluntary national labeling standard, as proposed by the Safe and Accurate Food Labeling Act.

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