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Robbins, Russell, Englert, Orseck, Untereiner & Sauber LLP

Tristan: Exactly.
Carolyn: Senator Leahy?
Tristan: Thank you.
Carolyn: You're welcome. Other questions or guests. Thanks you so much.
Abby: Please come to farm/school awareness [00:43:34 INDISCERNIBLE] at 5:30. We've talked a lot about food [00:43:37 CROSSTALK]. In the cafeteria where we bring it to you.

[End of Audio#1 00:43:50]

[Start of Audio #2]

Carolyn: We really are very thankful to have Michael Hansen here in person. Last year he testified via phone and we appreciate you making the trip.
Michael: My pleasure.
Carolyn: You could maybe kick it off by saying who you are, where you come from and what you do, and maybe a little bit about your background.
Michael: Yeah, that's what I was going to do. My name is Dr. Michael Hansen. I am a senior scientist, as you can see at Consumers Union; they're the publisher of Consumer Reports. Actually I've worked there for over 25 years, and the issue of genetic engineering I've worked on since 1987. That has been

both here in the US and then internationally there's a global network of consumer organizations called Consumers International. We have 220 members in 115 countries, so stuff at the global level we've been involved in. I'll talk about Kodak Salimantarius [00:00:57 PHONETIC] their task force on foods derived from modern biotechnology and other communities that have dealt with genetic engineering. I've actually been to all those communities, was at all the meetings of the task force, was actually on two expert consultations on how to do safety assessments for engineered foods. My background is I'm an evolutionary ecologist. I got my PhD at the University of Michigan. I did post-doctoral work at the Universityof Kentucky looking at the impact of ag research on plant breeding, and the impact of genetic engineering on that. I've worked at Consumers Union ever since. The area I work on is food safety issues, particularly associated with technology. So, we started out looking at pesticides and then there has been genetic engineering, cloning, nanotechnology, mad cow disease and antibiotics. So, those are all the areas I covered, but I've been on this GE fight for over 25 years. We helped to get the global consumer community saying that there should be mandatory safety testing and labeling back in 1987. Then in1988 there was the first global meeting and a declaration was out of [00:02:11 INDISCERNIBLE] in France. So, that's my background. What I'm going to do today here is argue, tell you why genetically

engineered food should be labeled; it's because of inadequate regulations and unanswered safety questions. And if we look at an outline for those of you that don't know what genetic engineering is I'm going to run through the basics of biotechnology and sort of how they do this, and then quickly a slide that will show you what crops are engineered, what percentages of the acreage. Then I will talk about the policy the FDA has or in fact does not have on genetic engineering and will [00:02:50 INDISCERNIBLE] that with the global policy which has sort of been written into the WTO. Then we'll start to look on health issues. That will first be on unintended effects, that's not the effect of what you're actually putting into the plant. There is health and safety issues with that, there is also safety issues associated with the technology itself, these unintended effects.This was actually a long time to get this recognized. It took fights at the global level to get actually language saying that unintended affects should be looked at. Then we'll go through some of the animal feeding studies that suggest there are problems, and then I'll do a summary. So, let's go through some of the basics. This is the basic structure and function of genetic material. We know that genetic material is comprised of DNA, deoxyribonucleic acid, and there is also a version called, well one of many versions, called messenger, RNA. And genes which codes for traits such as eye color, a pigment, an enzyme; those trades are coded in a gene. What a

gene is it's actually part of a chromosome. So, here we see a chromosome, and what a chromosome is, is genetic material, the DNA and these associated proteins, which are called histone proteins. This just shows you the nucleotide base pairs. There are four of them, Adenine, Thymine, Cytosine and Guanine. This is what DNA is. If it were a messenger, RNA, it's all the same base pairs instead of Thymine you have Uracil. So, genes which code for traits are arrayed along the chromosome. These chromosomes then are really these double helixes. The way they replicate each of the steps here is this double helix, which is made up of these nucleotide bases, these bonds break and the strands separate. Then since C always pairs with G you're always making an exact copy. If you cut this in half then that means C will again pair with G, A with T, C with G, so you get these strands which are identical. So, that's how plants when they're reproducing when cells are dividing that's what's happening, the DNA is replicating itself and you're doing duplicate chromosomes which go to each sides of the cell. Once that's complete, how does the gene get transferred into a trait like an enzyme or a protein? The way that happens is the nucleotide base pairs are actually read by RNA. First what you do is you have to create a message, so that means the gene you're interested in has to be transcribed, has to go from DNA into the message, which is this messenger RNA. So, if this was the DNA sequence and you're making RNA this would look like GUGU right. So that's how the

plant can tell the difference between RNA and DNA. This message now, which is transcribed from this gene that then is in the nucleus of the cell. That travels outside of the cell into the cytoplasm and it goes to things called ribosomes where the proteins are actually constructed. This messenger RNA, which is nothing but a sequence of these nucleotide bases, they're each read in sets of three. Three nucleotide basis will code for an amino acid, so that's how these protein chains happen, and that's called translation right? So, what happens is you have these transfer RNA's looking at each three and each different set you have a different transfer RNA that's associated with these individual amino acids. So, these are all being read, this message is read and then a protein is created from that process. And the reason that I wanted to show you these steps is because it turns out the science is imprecise and unintended consequences can actually happen at the transcription stage, at the translation stage, and as we'll see, at the transformation stage. So, this is the basic structure and functions of genes in chromosomes. So then, the idea is how do you get foreign genes into a plant? How do you get genes from mouseinto a corn plant for example? There are two ways to do it. You take the gene you want and say, for round-up ready, what they've done is they've taken a gene from a bacteria, this gene is called EPSPS, and it basically gives you resistance to [00:07:52 INDISCERNIBLE]. The ironic thing about that trade is it came from a bacterium in the

environment, but it was in the environment of actually a production plant for [00:08:03 INDISCERNIBLE]. So, it was in the waste water that they were able to pull out an organism that can survive that and that's where they got the gene for resistance to [00:08:14 INDISCERNIBLE]. So, what they do is you take that gene and you have to add other sequences, regulatory sequences so it's recognized by the plant. You have to add a sequence at the end to tell it where to stop, so you make something called the genetic cassette. Then there are two ways to actually insertit into a plant. When you want to transform a plant you're actually transforming individual cells. You can't transform a whole plant, so what they do is they do a petri dish, there are individual cells and the way you insert that material is two ways. Either there is this natural way, there is a bacterium called agrobacterium[00:08:51 INDISCERNIBLE]. It is one of the few organisms in nature that the way it works is it codes for what's called Crown Gall disease. I don't know if any of you have seen Goldenrods or any of these weeds that have these little galls on the side or on trees, that's actually often agrobacterium inserting itself. What it does is this bacteria is able to take its DNA, insert it into the host plant and incorporate it into the host plant and then cause the plant to do uncontrolled growth. That's where you get the galls forming. So, what they do is they took that natural ability of agrobacterium. To do that they stripped out the genes that cause

the disease and in their place you can put in the gene you want say for herbicide tolerance right. You then create this plasmid and they're called tiplasmids (TI) and that's from agrobacterium[00:09:48 INDISCERNIBLE]. That naturally can assert itself into the plant and into the nucleus and into the DNA. But, agrobacterium, when it does that, it has no control over where it's inserting itself, so if it inserts itself into a gene that's doing something that's disruptive. The other way to do it is with this gene gun. This is called biobalistics. That's where you take the genetic cassette, you coat gold or tungsten particles with it and you literally shoot those into a petridish. The ironic thing is when this was first developed it was actually developed at Cornell University with money from DuPont, and the original prototype was actually a 22 caliber pistol; and [00:10:33INDISCERNIBLE] I should have brought the video of it, but the petridish, when they first fired these shots into it, it actually jumps up an inch or two. So, that's a perfect metaphor because it scatter shot, that genetic material is then in the cell and some of it will hopefully cross over and insert itself into the host or the host [00:10:56 INDISCERNIBLE]. Then the next step is once you transform these cells, once you've inserted this genetic material, either via agrobacterium or the gene gun, you have to figure out by looking at them which oneshave taken up the gene you want. You can tell by physically looking at them so you need a marker. In the early

80s they often put this GFP, green fluorescent protein, because if the gene is there it actually glows green and that's why you would see, I should have brought them, there were comics in theNew York and elsewhere showing these green glowing organisms, but what they use in agriculture is a resistance to an antibiotic, because then all you have to do is in the growth medium you just put it an antibiotic and the only cells that will survive are the ones that have resistance in that antibiotic. If right next to that antibiotic resistance you put the gene that codes for herbicide tolerance that's how you know it's there, any cell that survives. That's why the vast majority of these crops on the market have actually an antibiotic resistant marker gene, because they have to be able to tell out of the thousands of cells that are there the transformation rate is usually very small, maybe 1 out of a 1,000, 1 out of 10,000 so you have to select those. You then get to transformed cell. You still have to then regenerate from that single cell back to an entire plant. At each of those points you can come up with unintended consequences, which we'll talk about later. But, I just wanted to give you a view of what genetic engineering is. This is the basic technology they use. There is actually, once we get into animals and other things there is more complicated stuff going on, but we don't need to know that. Let's now look at what's actually been engineered and is on the market. To date there have been 94 crops that have been approved. There are 94

versions. Very few of them are on the market. The main traits are herbicide resistance and insect resistance. Herbicide resistance is responsible for global acreage about 85%. I would say it's that much or higher in the west. And then there is insect resistance, this is the BT crops. In between the two of them there are over 99.5% of all the acreage, both in the US and globally. And then, we actually have virus tolerant crops. The only one that's really around here would be there is some papaya and some squash. So, let's look at the major crops that are engineered. Most of this data is as of 2011; soy beans 93% of the US acreage, all herbicide resistant and [00:13:40 INDISCERNIBLE]. Sugar beets, 95% all herbicide resistant. Corn, we have both BT and herbicide resistant, 88% of the acreage of corn according to the USDA as of last year is engineered. Canola, 93%; cotton, which is both, so canola is basically herbicide tolerance, herbicide resistance; cotton is both BT and herbicide resistance; engineered cotton 94% of the global acreage. We also have papaya which is virus tolerant. As of 2010 there is an estimate that 80% of the papaya's in Hawaii are virus tolerant. Those are the sum-ups. Then we have zucchini, and as of 2005 this is the crooked neck squash, there were about 13% of the acreage was engineered. I think this is much lower now. So, this is an indication of the major crops that are on the market, how GE works. Now let's turn to policy both in the US and then internationally. The FDA in 1992 they put out a

statement of policy on these new plants. It was introduced at a press conference, and actually bio, the biotechnology industry organization was introduced on May 27th by then Vice President Dan Quayle. It was introduced as a deregulatory initiative which came out of the competitiveness counsel. They were saying they were deregulating it. It was based on the notion "that the new techniques in gene genetic engineering are an extension at the [00:15:28 INDISCERNIBLE] level of traditional methods used to achieve the same goals as traditional breeding." In other words, they were saying genetic engineering is just an extension of conventional breeding, so the crops will be treated the same under the law. For you to put a new variety of tomato or any crop there is no requirement for a safety assessment. So, there's no requirement for human safety testing, but they said, for the foreseeable future they would hold these "voluntary" safety consultations. To datethere has actually 95, well 94 and there was another consultation that was actually with the flavor saver tomato. That's the only one that's actually gone through an approval process because they're couching asks that the antibiotic resistance marketing be treated like a food additive. So, it would go through some kind of required safety testing. All there have been is these 94 voluntary safety consultations and then everybody goes around I've heard it here, and when I'm traveling internationally, it's always the FDA says these crops are safe. That is not true. Here is what happens. After those

safety consultations the FDA sends the company a letter. I'm going to show you one letter and there are two key sentences in it, well actually one key sentence I'll focus on, and this key sentence is in every single one of the letters. This was one that was sent of Monsanto and it's about MON-A10 [00:16:55 PHONETIC]. That was Monsanto's first BT corn variety and that letter they received September 26, 1996. Here is actually the link you can pull the letter up yourself, and as it said, this is the FDA speaking, "Based on the safety and nutritional assessment you have conducted it is our understanding that Monsanto has concluded that corn products derived from this new variety are not materially different in composition, safety and other relevant parametersfrom corn currently on the market, and that the genetically modified corn does not raise issues that would require pre-market review or approval by FDA." The FDA is functionally saying you, Monsanto, or [00:17:33 INDISCERNIBLE], or [00:17:34 INDISCERNIBLE] you think these things are safe and they don't require any review by FDA. The FDA makes no conclusion themselves. And the reason they do that is their lawyers know that they're not doing an assessment, because if they made a conclusion about the safety if something went wrong down the road the companies would have partial liability protection. As I said, a variation of this sentence is in all of '94 safety consultation letters. This is a link to that one and I can actually give you a link to see every single one of them

if you would like. So, the FDA clearly does not require premarket safety assessment, and does not state its own opinion on the safety of the engineered products, except for the Flavor Saver. So, if anyone tells you that the FDA has said these are safe that's not. Saying that the company thinks they're safe is not the same thing. Now, let's look at, I told you that [00:18:26 INDISCERNIBLE] actually went through a safety assessment. The scientist that did that work at [00:18:31 INDISCERNIBLE] was Belinda Martineau. She wrote a book about the Flavor Saver tomato and in her quote she points out that they did work, but as she said, most of the data that they say that they're safe to eat, simply proclaim and "that these foods are safe and there is no scientific evidence to the contrary," is not the same as saying extensive tests have been conducted and here are the results. In fact, without further elaboration no scientific evidence to the contrary" could be construed as no scientific evidence period. So, the reason this is important is if you don't require safety assessments then you don't have the studies. You have maybe an occasional thing that one of the companies wants to do, but you don't have the studies to make a conclusion. That's why she was particularly upset about this. And in fact, if you look at it one of the safety assessments they did for Flax was like 15 pages. So, she said that now fast forward almost 10 years and it turns out the FDA is going to, after pressure from us and others, are going to functionally say

that they were wrong. They put out a premarket notice concerning bioengineered foods. This is where they were going to require the companies to tell them 120 days before they were going to market any product. And here is what the FDA said, because some recumbentDNA, this is GE, induced unintended changes, are a specific transformational event, e.g., those resulting from insertion of [00:19:58 INDISCERNIBLE], FDA believes that it needs to be provided with information about foods from all separate transformational events, even when the agency has been provided with information about foods from [00:20:09 INDISCERNIBLE] modified plants with the same intended trait that is the exact same genes, and has no questions about such foods. In contrast, the agency does not believe that it needs to receive information about foods from plants derived through [00:20:23 INDISCERNIBLE], which is traditional breeding. That clearly is stating that there is a difference between the two. They said, we're going to want data on each separate transformational event, but we don't need it for traditional breeding. That's an indication that there is a difference, and yet, neither of these policies, that 1992 policy was actually never finalized, because what happened when the '92 policy came out there were 4,000 comments. Almost all of them were about labeling, so in '93 they sent out another notice and they said we'd like comments on labeling. And they said after we gather these comments we're going to hold a public hearing on labeling

and then we'll make a decision to finalize this policy. That never happened, so that '92 policy has never been finalized, neither has this 2001. Yet they're regulating back on the 1992 policy saying that there's no difference when in fact they themselves admitted in 2001 that there is a difference. Now, let's look globally. Kodak [00:21:24 INDISCERNIBLE], that's just Latin for food standards, that's the food safety standards setting organization of the UN jointly run by the World Health Organization and the Food and Agriculture organization. Next year will be its 50th anniversary. There will be a blow out in Rome. This was originally set-up to help developing countries with the range of these standards. Everything changed in 1996 because [00:21:48 INDISCERNIBLE] general agreement and tariffs and trades sets up the World Trade Organization. Then the 1,200 pages of documents setting up the WTOturns out if there is any challenge on food safety anything that comes out it references Kodak [00:22:01 INDISCERNIBLE]. So, Kodak standards, guidelines and recommendations are considered trade legal and referenced by WTO. That means if you meet the correct standard you're immune from a WTO challenge. If you're weaker than that you can potentially be challenged. That's why Kodak is so important. Here is what they've done on biotech. There was an ad-hoc intergovernmental task force on food derived from modern biotech. There were two rounds in each four-years 2000, 2003; 2005 to 2008 hosted in Japan. It was usually in Chiba, a few

years it was in Yokohama. Four key documents came out of that: principles for how to do a risk analysis of foods derived basically from GE; [00:22:47 INDISCERNIBLE] conduct of modern food safety assessments, so this is how you do it from plants, this is how you do a safety assessment from food derived from a recombinant DNA organism, and how you do a safety assessment of foods derived from recombinant DNA animals. I should also point out, in the Vermont legislation the definition of genetic engineering and biotech is the same as this Kodak definition which has been globally agreed upon as part of WTO. It's also in the [INDISCERNIBLE] protocol.

[End of Audio#2 00:22:57]

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Michael Hansen: Label from [INDISCERNIBLE 0:00:01] modern bio cap including fluid containing genetically modified organisms. The latent should be conforming with the tracks which is fine to avoid potential trade barrier it basically [INDISCERNIBLE 0:00:12] of help, inform consumers choices or guiding genetically modified food stuff and what you want--need to know is in 1991, the charge that was given to the codex committee on food labeling by the commission was how it could be made known with the consumers that foods have been genetically modified. That was the charge and it took us one year to get this document out because this now means that the US can't [INDISCERNIBLE 0:00:36] just to other countries because they--they US was arguing that any form of labeling is misleading and is wrong. Well there's a global agreement that's not true. So now let's turn to the unintended effects. This suggest one little slide because you have no control over where [INDISCERNIBLE 0:00:53] certain things, all sorts of things can go wrong, [INDISCERNIBLE 0:00:57] I'll talk about quickly where one is really--two that are interesting as--this is golden rice right? Everybody knows that it's golden rice that is engineered you know to [INDISCERNIBLE 0:01:07] vitamin A. What you don't know is that that is an unexpected effect be because what they were trying to create was red rice. Red rice occurs naturally in South Asia but the red which is lycopene is in the cusp and when you know it, right? To a--to store the endosperm, there's--there's no

lycopene. So what they were trying to do was create lycopene in the endosperms so you'd have red rice. Well what happen is when they engineered the plan, the plant then turned on an enzyme called lycopene cyclase and that turns lycopene into beta carotene. Beta Carotene is that yellow color, that's why they were yellow and actually two steps away on that synthetic pathway is retinoic acid which is a--a potent [INDISCERNIBLE 0:01:53] which causes birth defects and we've been trying to get [INDISCERNIBLE 0:01:58] and the folks are doing the gold rice project to look and see where there's an increase and [INDISCERNIBLE 0:02:04] so that's an example. Here is--in soy beans the roundup ready soybeans, it turns out as part of the [INDISCERNIBLE 0:02:09] higher [INDISCERNIBLE 0:02:10] content and what happens at high soil temperature, those stems split and the plants fall, and that's an unintended consequence. The data is not in here from corn but any entomologist who works with BET corn knows that that ligament is stronger so that--what's happening I parts of the [INDISCERNIBLE 0:02:28] they [INDISCERNIBLE 0:02:31] from the corn stalks are actually puncturing tires, the big tires that are on--that's how hard they are and the scientist, the entomologist that work on these things talk about [INDISCERNIBLE 0:02:42] corn plants. So these are some examples of unintended effects. This is a study that was done in Italy and proteomics is the study of expressed proteins so in addition to look for what you are inserting, you

can look at what's being disrupted by looking at all the proteins and this is a good way to detect unintended effects that are associated with the genetic engineering particularly that disruptive effect of the insertion, some of us had been arguing this should need to be done for 15 years. When it's finally done, they took [INDISCERNIBLE 0:03:13] first are variety, it's in your Isoline that is the genetic [INDISCERNIBLE 0:03:18] where it came from and they grew them side by side in a growth chamber. That means exact same environment, the only difference is that you can see in those plants are going to be due to the genetic engineering process. And here is what they found, there were 43 proteins that were disrupted, that means they were either increased the amount by over double, decreased by over 50% or you could take a gene that's turned off and turn it on or vice versa. The important thing is, one of the newly expressed facts that was on in the non-engineered plant but was turned on in [INDISCERNIBLE 0:03:55] is the gamazine. Gamazine is a known corn allergen right? So we are not taking about the [INDISCERNIBLE 0:04:03] that was put in there, people that are allergic to corn are often reacting to gamazine, that gene was not turned on and [INDISCERNIBLE 0:04:09] is turned on there. So this tells you as an unintended effect, the process of genetic engineering turned on in endogenous allergen gene. When I made this comment in 1988, I was told by [INDISCERNIBLE 0:04:24] at the FDA "Well this could never happen. The

[INDISCERNIBLE 0:04:25] of that is 1 in 5 million so [INDISCERNIBLE 0:04:27] studied and that's what they found. Even more important, they go as a major concern, a number of the [INDISCERNIBLE 0:04:33] storage proteins and remember when you are eating corn or wheat or soybeans, you are eating seed storage proteins. A lot [INDISCERNIBLE 0:04:41] and the [INDISCERNIBLE 0:04:44] storage proteins, exhibited truncated forms having molecular masses, significantly lower than the native ones, that is in the engineered plants, the seed stored proteins are shorter. What effect does that have on health? Who knows unless you actually do a study. So this clearly shows for unintended effects, we've shown them in general, here we've shown known allergens being turned on, major changes in the seed storage and this is the beset design and experiment because you are controlling everything. You are taking the [INDISCERNIBLE 0:05:14] you are growing them in the same environment, let's now turn this from animal feeding studies following up on [INDISCERNIBLE 0:05:22] study, this was also done in Italy [INDISCERNIBLE 0:05:24] again with this [INDISCERNIBLE 0:05:24] isoline grown during the same time in [INDISCERNIBLE 0:05:28] fields and that's to control for environmental effects. This is where they were doing feeding studies with mice and they--the idea was we'll take young mice, medium mice and old mice because they are going to be more susceptible and maybe we'll something. So they looked at the [INDISCERNIBLE 0:05:45] peripheral immune

response and they fed for 30 or 90 days, this and guess what, they found significant changes in the T and B's--T and B cells and then all these various signaling agent subpopulations and they are increasing this interleukins. All these things are cytokines that are involved in both the allergenic and inflammatory responses. So clearly they are saying this is after on [INDISCERNIBLE 0:06:14] feeding. So as they conclude, these results suggest the importance of the gut and peripheral immune response, the GM crop ingestion as well as the [INDISCERNIBLE 0:06:23] GMO safety evaluation. Again, careful design study is showing adverse effect on the gut and peripheral immune system, let's now go to--this is not animal feeding study but this is important because it was late in 2011 when this came out. This study involved looking at 30 pregnant women, 39 pregnant women in Quebec and they took blood from these women and they wanted to look at pestecides that are associated with that genetic engineering. So they look for [INDISCERNIBLE 0:06:50] which is some of the BT crops and they also look for glyphosate because that's a roundup ready crops and glufosinate that's what's in the [INDISCERNIBLE 0:07:00] link or crops that are resistant to [INDISCERNIBLE 0:07:03] and it turns out they not only detected glufosinate but here is the surprising thing. [INDISCERNIBLE 0:07:09] was found in 93% of the pregnant women's blood and 80% of the [INDISCERNIBLE 0:07:16] blood and in non-pregnant women 69, here is the graph and you can see

pregnant women have high levels and again the non-pregnant women and also mother and the [INDISCERNIBLE 0:07:31]. So that's the whole protein that they are finding in the bloodstream. The implication of this, I don't know [INDISCERNIBLE 0:07:38] this is the first study that highlight the presence of these--in maternal, fetal and non-pregnant women's blood, these are clearly detectable, they said given the potential toxicity of these environmental pollutants and the fragility of the fetus, more studies are needed particularly those using the placental transfer approach. So we know that obviously somehow the cry protein is getting into the bloodstream. It was detected there, they can't tell whether it--where it came from but there's very little use in organic agriculture and the amount that is being produced in some of these corn plants, some of these stack traits, if you look at the amount of cry protein on a field basis that is coming out of that, it's almost 11 pounds. It's 160,000 times the level of what's actually in the soil. So that's probably where they came from. Now let's look at--this is a study--since I only have a short time, these are feeding studies where [INDISCERNIBLE 0:08:34] and colleagues looked at all the long term feeding studies that are out there in the scientific literature, there are 17 of them okay? And what they did is they go from 240 days to just 90 days and they looked at all these different parameters, you can see we have roundup ready soybeans and corn or these are all BT corns and these are

all [INDISCERNIBLE 0:08:57] and they looked at all these things, they looked at all the parameters, the blood parameters and literally there were thousands of parameters that they looked at and they [INDISCERNIBLE 0:09:04] all the data together and then look and saw where they saw statistically significant differences. Now if you are looking at say 6000 different things, you are going to come up with a number of betters statistically significant by chance. However, what's interesting is they were out of these 600--694 to 698 of the parameters they--they measured were--were significantly different, statistically significantly different. When they looked at those, if that's just either you know random, that some of them are going to be randomly positive, you would expect those then to randomly occur you know, the systems you are looking at. They didn't. Three quarters of all those disruptive parameters were only found in three systems. The liver, the kidney and the bone marrow, the reason that's important is the liver and kidney are the part of the body that are destoxifying poisons and toxins and the bone marrow is where the white cells are used in you immune system are created. So the parts of the body that are dealing with the immune system and toxin, decontamination, that's where the vast majority of these disrupted parameters are showing up. If they were occurring randomly, then they would randomly throw out all the other systems. The alimentary tract, every place they look.

The fact that they are all circling here suggest that there is a problem and in fact they found that there was a significant difference between males and females, in the female lines, there was--the livers were being upset more, the vast majority and in males, it's the kidney. So you are seeing sex difference and this is looking at all the [INDISCERNIBLE 0:10:48] together. So the people when they've just looked at individual studies they'll say "Well, we'd find a few statistically significant differences but we don't see those [INDISCERNIBLE 0:10:58] we don't see it moving so therefore we can ignore it." When you look at all of the together, if this is just all random noise, how come they are focusing in on just the parts of the body that are involved with detoxifying toxins in dealing with things. And I could go through many of those studies to show what they've been showing but I won't, what I'll not turn to is since this was the explosive [INDISCERNIBLE 0:11:20] study from last fall, I'm sure you know about it, it was the first long term, that as like two-year feeding study of engineered foods, these rats were fed roundup resistant corn and NK603 and this is owned by [INDISCERNIBLE 0:11:34] and they did it at three levels, 11%, 22% and 33% and these were cultivated with and without roundup right? Because that's how they are intended to be used so it should be framed round up on them because that's all they are--intended to be used. They basically found the females died two to three times more quickly, they developed mammary tumors

more often in controls, males had the liver and kidney problems and there were more large tumors. I'm sure everybody is saying this [INDISCERNIBLE 0:12:02] was all over the place, these are just some of the pictures of the mammary tumors and--and the females, see this was [INDISCERNIBLE 0:12:10] GMO by itself, this was on [INDISCERNIBLE 0:12:14], so they are just showing these large tumors. Everyone, there was a huge [INDISCERNIBLE 0:12:19] over this last September and October and what happened was the main criticisms of the study if you would read the [INDISCERNIBLE 0:12:27], you would refer that this--that this was a completely horrible study. It was junk science, they said the sample size was too small for a cancer study, there are only 10 rats per group and they said Andrew using these strand of rats, the [INDISCERNIBLE 0:12:41] rats, that is [INDISCERNIBLE 0:12:43] they are particularly prone to mammary tumors and--with some--scientist say 80% of them get this mammary tumors. So you are using the wrong rats and you didn't even use the--the right sample size so this work is useless. However, let's look at the--this is the [INDISCERNIBLE 0:13:00] table from that and it's what [INDISCERNIBLE 0:13:03] can get--this is actually this [INDISCERNIBLE 0:13:06] paper from 2004, this is the Monsanto paper that was the [INDISCERNIBLE 0:13:10] study on NK603, it was published in the same journal. Look at this. Doses, three right? Recommended, these are the regulatory tests that--that are recommended for chemicals by the [INDISCERNIBLE 0:13:23],

they said you should at least have three doses. Okay, and Monsanto only has two, look at this. Animals were a group. Ten of these dawley rats, they're being measured. In here there are 20 rats but they are only ten that are being actually measured for these parameters. So these Monsanto studies are using the same sample size and look, it's the same type of rat, this [INDISCERNIBLE 0:13:48] dawley rats that's why Dr. Serolini [SP? 0:13:50] used those rats because all they did was take the regular short term being studied and let's let it run for two years. If I use a different type of rat, then you wouldn't know which effect was due to the different variety of rate versus the--versus the chemical [INDISCERNIBLE 0:14:09], this should also be pointed out when glyphosate was re-registered in Europe in the mid 90s that the feeding study, the two-year feeding study they did with rats with you know diluted glyphosate, they were [INDISCERNIBLE 0:14:21] dawley rats. So these notion that these rats are useless for this is like well if they are useless, how come nobody complained when they were using studies which supposedly showed these stuff were safe? And if--if--if samples size can it's too small to show that there's problems then how come you are accepting studies that also [INDISCERNIBLE 0:14:40] only have a sample size of ten that don't show any problems. Where are all these scientist complaining about the experimental design when the safety study is saying no problem, we are only having 10. What they are doing is they are hiding

the fact that it's true if you do a cancer study, then you should be using 50 rats and so what [INDISCERNIBLE 0:14:58] and then the way they manipulate this in the media, they said "Well this is not properly designed study for cancer." Well they didn't expect to find that right? They were looking at the conventional stuff. Let's actually look. Let's look at what the French Food Safety Agency said. Everybody quoted this part, the expert assessment paired up by the agency concludes that the results of this research do not cast out on the previous assessments of this NK603. So that means they are saying "Well this looks like this was useless work" but then, on the next paragraph it's "Well, they do draw attention however to the originality of this study" namely it's focused on the subject rarely investigated. Long term effects in association with the chemicals that they are spraying with. So they are saying "Okay, there's a point there" and in fact they went further and said "We recommended initiating studies and research on long term effects of GMOs in combination with plant protection products. So even though this was enough to change their idea, they are not saying "Yeah, well actually we should be doing long term test, they should be with this" there is a concern with the industry money so that's why they are calling for public funding [INDISCERNIBLE 0:16:09] European level to enable these large scale of studies and research for consolidating knowledge of insufficiently documented health risk. Let's now look with

EFSA, the European Food Standard Agency did, this was at a meeting on December 17th [INDISCERNIBLE 0:16:26] European commission is trying to find a two-year GMO feeding study. The [INDISCERNIBLE 0:16:33] executive director said "Well, it's going to be on [INDISCERNIBLE 0:16:35] not NK603. The EFSA board on Thursday the previous meeting on the tenth, there was agreement that long term studies were needed, it's just a question of how to fund them. So even though people said that the Serolini [SP? 0:16:50] study was nonsense and it was complete garbage, well how come both the French agencies and EFSA, they all said "Oh yeah, this doesn't change our view but yeah, there does need to be long term studies. They do need to be publicly funded and they do need to e done in conjunction with the--with the pesticide." So in other words they were saying Serolini [SP? 0:17:10] had something there and now where I'm going to end with is that the--the American Medical Association, they changed their policy on genetically engineered foods at their meeting last June, you've got the document that I submitted to them, they did not change, the still said there's no reason for labeling but look, previously it said our [INDISCERNIBLE 0:17:33] supports efforts for the systematic safety assessment. They change that and the new language, this has been removed and what they amended it is mandatory [INDISCERNIBLE 0:17:42] market. So you have the--you have the AMA going from "Yeah it would be a good idea to look at this" to

"We support mandatory pre market safety assessments" FDA doesn't do though, so that means they are--and you don't move from a position from "It would be a good idea to do this" to "It should be required unless you are admitting that there is a potential health and safety problem" right? And it said that they should do work, detection of unintended effects, this is substantial equivalence, look at [INDISCERNIBLE 0:18:13] regimes and allergen [INDISCERNIBLE 0:18:16]. So right here, the AMA has now changed this position, they are now supporting mandatory safety assessment. And in quick summary, the US policy on engineering plants is inadequate here, we don't require safety assessments, we don't require labeling, we are behind the curb internationally. Any country could require safety assessments for these engineered plans and then block stop coming from the US because we don't require the safety assessments. There's also unanswered health question because the studies hadn't been done and that's why labeling is needed to potentially detect any adverse health effects [INDISCERNIBLE 0:18:53] GMO because the AMA admitted there should be mandatory pre market safety assessments, the FDA does not do that, that means all these foods around the market--how would you know there is a problem? Clearly people aren't dying in the streets but if there's more subtle problem, the only way you'd know is you have to be able to track it, that's why you need labeling and that's why globally the language that is, is labeling serves as a risk

management measure to deal with scientific uncertainty. This is now what's been allowed internationally, so labeling is fine with its purpose, it is--it can be written into WTO and that's why you should support this [INDISCERNIBLE 0:19:33] 112 because that's what this bill does. It takes--and I think the argument you use, I testified here on the RBGH [SP? 0:19:40] case in the '90s. We got that through and that it was overturned. The reason it was overturned is because the state's attorney general here would not say that there were any potential health questions. That is the compelling state interest. You don't have to show that someone is going to die, it's you don't know. Just like if you are putting a new additive on the market, you don't know unless you require the safety assessments, that's why labeling is needed, that's why the [INDISCERNIBLE 0:20:08] story case went down and in fact, if you actually look, you should look at the case that was done in--because I have it here, the case that was done in Ohio because I was actually intimately involved in that and--and appeals for it over--overturned this Ohio decision that said you can't label and if we actually believe that's right here, yep. If--if you go through this you should really--or read it, I understand you heard from [INDISCERNIBLE 0:20:43] yesterday, they talked about the Central Hudson Fest and the [INDISCERNIBLE 0:20:46] test, he goes through this very clearly but he also states for RBGH [SP? 0:20:52] there is a clear difference, let me show you, there is

a clear difference between milk from treated and untreated cows, I love this, this is a very clear document and since it used some of my work. Yeah [INDISCERNIBLE 0:21:08] where they said making claims [INDISCERNIBLE 0:21:11] let me get the analysis. Yeah, this is where these cow [INDISCERNIBLE 0:21:21] claims where people said if you label something RBGH [SP? 0:21:24] free that's [INDISCERNIBLE 0:21:24] misleading because it implies a difference when the FDA has said that there is none and here is what the--the district [INDISCERNIBLE 0:21:33] composition claims when [INDISCERNIBLE 0:21:35] misleading quote because they imply composition [INDISCERNIBLE 0:21:38] between these products that are produced with RBSD [SP? 0:21:40] and those that are not in contrary [INDISCERNIBLE 0:21:43] and there is no measurable com--compositional difference and then the [INDISCERNIBLE 0:21:47] said this conclusion [INDISCERNIBLE 0:21:49] record and we thought you are able to get this in, I've been using these arguments [INDISCERNIBLE 0:21:55] one of these things from the market since 1993 and it says conventional milk is treated with RBSD [SP? 0:22:00] as [INDISCERNIBLE 0:22:01] by the [INDISCERNIBLE 0:22:03] parties, RBSD [SP? 0:22:00] has been shown the elevated levels of IGF1, it's a naturally occurring hormone that in high level is linked to quite a number of cancers, the [INDISCERNIBLE 0:22:12] also point to certain--this is all my stuff, studies that indicate RBSD [SP? 00:22:16] use, induces an unnatural period of milk production during the cow's

negative energy phase, more produced during the stage of low quality because increase fast, decreased level of protein. Second difference, third difference [INDISCERNIBLE 0:22:30]. This [INDISCERNIBLE 0:22:32] precludes as from agreeing [INDISCERNIBLE 0:22:34] this records [INDISCERNIBLE 0:22:35] that there is no compositional difference between these two types of milk. It took us a long time to get this but we now have a [INDISCERNIBLE 0:22:41] saying there is no difference if--if you look further in this decision they go through all the issues that are the central Hudson factors in the [INDISCERNIBLE 0:22:51] factors. Read this, and anyone that wants it, I had [INDISCERNIBLE 0:22:55] I was actually [INDISCERNIBLE 0:22:58] to cut a deal, they have an arbitration meeting so I was actually at the arbitration meeting to talk with, IDFA and the Ohio folks and everything. So this is actually very wonderful decision and a view that have [INDISCERNIBLE 0:23:11] because of the [INDISCERNIBLE 0:23:13] story, I think your concerns will be alleviated by this and these concerns that--I should also point out that people have tried to say that--that this case could be challenged with [INDISCERNIBLE 0:23:27] and that would not be the case if it--it--it is true that--that the FDA has [INDISCERNIBLE 0:23:34]. That's why these [INDISCERNIBLE 0:23:37] 37 or the [INDISCERNIBLE 0:23:39] here or western Washington or other place, we made very sure that there's no reference to labeling in ingredients because that's clearly

preempted. But as it turns out, the FDA does not have a policy on engineered foods, I know. They are dealing with this 1992 policy which says that there is no difference. So you really wouldn't be preempted and I'll stop here after saying these things and take any questions that you want. This power point will be immediately available to anybody that wants it in printed form or whatever.

Michael Hansen: [INDISCERNIBLE 0:24:13] I got to get my voice again. Thank you Michael. and we would love to have a copy of the power point. I'm wondering if there are any questions, Dale?

Dale: Yeah, thank you very much, that was really informative. I have a bunch of questions [INDISCERNIBLE 0:24:36].

Michael Hansen: Sure.

Dale: You mentioned a few of these studies and we've heard you know last year and over the course of the last year that there had been numerous animal studies all over the world and publishing various [INDISCERNIBLE 0:24:53] showing adverse effects in animals. And it seems like there are some sort of--like a reality distortion [INDISCERNIBLE 0:25:00] because the FDA said it's safe because we don't have studies--

Michael Hansen: No. The--actually the FDA doesn't really say they are [INDISCERNIBLE 0:25:08] they aren't saying "Well we don't have evidence of they are unsafe." That's a very different thing because you could put--if they required--if they required

testing of pesticides for example, pesticide on market [INDISCERNIBLE 0:25:23] you could say that there's no evidence [INDISCERNIBLE 0:25:27] because they haven't done the safety. So the FDA--get this out of your nation. The FDA does not say these things are safe. Those letters, they don't say that.

Dale: But [INDISCERNIBLE 0:25:38] knowledge, the veracity of these studies.

Michael Hansen: No. Well we could go through them, some of them are poorly designed but there are some that--that have a very high design. I've chosen some of the ones that have--have a meticulous design. I'm not the kind of person to go [INDISCERNIBLE 0:25:56] because there have been studied that have showed all these crazy things that their designs aren't well so they should not be really looked at but everyone likes to run with them.

Dale: If there was a--a credible study that came out of the [INDISCERNIBLE 0:26:09] United States that showed some of these end results, it would seem that that would not only give credence [INDISCERNIBLE 0:26:18].

Michael Hansen: Right, but you know--but guess what--guess what a problem with that is. I could go on through all of these but it turns out since--since they say they're engineered right? Not only our farmers for being [INDISCERNIBLE 0:26:30] saving them, farmers are [INDISCERNIBLE 0:26:32] for giving those statement to like researchers. The only way the researcher can

get them is they have to go to the company and so if they want to do an environmental study or a safety study, you've got to get signed off from the company and that's why in 2009, 26 scientist that work on--entomologist that worked [INDISCERNIBLE 0:26:49] crops wrote to EPA and said "We can't do our job" because they would not--for example if you want to compare Monsanto's [INDISCERNIBLE 0:26:58], see how that compares or--or Monsanto's corn [INDISCERNIBLE 0:27:01] protected variety versus some other competitors, you can't do that. They won't let you do it. You have to get approval and so the reason there's no safety studies at least in the US is because scientist have to get approval from the companies and approval for the design of the experiment before it's allowed to be done. I could tell you scientist that actually want to do follow studies to some of the work they published and the company said "No:" [INDISCERNIBLE 0:27:27] at New York University was the first one that showed the [INDISCERNIBLE 0:27:29] flows out of the roots into the soil and it can--it can affect organisms there so he actually wanted to look at more [INDISCERNIBLE 0:27:40] varieties and when he went to Monsanto to ask [INDISCERNIBLE 0:27:42] they said "No, we don't think this is a problem, you can't get any [INDISCERNIBLE 0:27:45]." So it's hard to do any of these safety studies because they can't be independent. You have to get an okay from the company.

Dale: How [INDISCERNIBLE 0:27:54] studies?

Michael Hansen: That's because he's over in France and they are all over him for how did you actually get the host--the--the [INDISCERNIBLE 0:28:07] isolines and he was able to get all those--I believe they are from Canada but he has a source that can all be documented and there have been folks in Europe that have been able to do some of these unintended effects studies because they are not under the same restrictions as here, as you know, a scientist here who--who have to go to the companies. That's the main problem. I mean what kind of research would we have on tobacco if any scientists have to go to the tobacco companies and get an okay on their research? That's just--it's crazy and you don't get good science that way. Good science comes from independent studies that are done by the government or done by independent scientist that everybody can argue about and some of these industry studies which don't show a problem, I could walk you through them and show you all sorts of bad things in their experimental design which they are done in such a way so you won't find the statistically significant difference.

Female: Other question for [INDISCERNIBLE 0:29:05]?

Female: Just a follow up. Can they not--and I'm not--so not a scientist and I really appreciating hearing your explanation. Can they do any studies with the product? Can they buy bundles of sugar beets or corn and [INDISCERNIBLE 0:29:22].

Michael Hansen: No if they buy that corn they have to get it from a deal and if you are an academic some place, unless you've

got an agreement with Monsanto--
Female: Is this because of their patents?
Michael Hansen: Yep.
Male: You are talking about the food products themselves.
Female: I'm talking about corn, yeah, not the seed.
Male: Going to the--
Michael Hansen: No, you would have to get--yes, someone could test a food product but then the issue would be okay, which particular corn [INDISCERNIBLE 0:29:45] transformation [INDISCERNIBLE 0:29:47] is it--is it--is it [INDISCERNIBLE 0:29:49]? Is it BT176? And [INDISCERNIBLE 0:29:54] doesn't come from that's why that's exactly what you want is the seed itself and you want it from [INDISCERNIBLE 0:30:01] you want it from the engineering plan and they need to be growing the same in [INDISCERNIBLE 0:30:06] so you don't control--
Female: To do--yeah, yeah.
Michael Hansen: And they don't do this. When you look carefully what they for controls is they'll use [INDISCERNIBLE 0:30:10] isoline but then they'll use other corn varieties that are out there in the environment and then when they [INDISCERNIBLE 0:30:16] the statistically significant difference, they say "Well, this isn't the range for the species, so this isn't really biologically relevant and the way I respond to that in [INDISCERNIBLE 0:30:26] is I said "Look, if you had a medicine that the side effect was it cause you to gain

15 ponds" if the other side came back and said "Well, but your weight is still within the range of the human population, that wouldn't be an answer for--yeah. That's a--that would be considered an important difference. So that's what they do, they play games, many of these studies they find statistically significant effects and then they dismiss them, they'll say "Well yeah, it's [INDISCERNIBLE 0:30:54] it's within the range for the species." That's just not good science.

Female: Other question? John?

John: You mentioned the study I've heard about before with the maternal blood and I think uterine blood and pesticides showing up there, how can--you may have said this, you I mean--you were going pretty fast. How can you know that if [INDISCERNIBLE 0:31:18] didn't come from another source?

Michael Hansen: Well you can't. So for the Cry 1AB, you can't tell what that source came from. First they tried to say "Well, this was a bad study, there's interference from the serum albumin, so that's why it's showing a positive--the only problem with that is if you read the study for the controls, they use diluted serum. So if that's what's causing a problem you shouldn't be [INDISCERNIBLE 0:31:45] there. But you are right. They can't detect whether that came from a spray or BT or from an engineered plant. But if you look at it the [INDISCERNIBLE 0:31:54] sprays, BT, BT is actually very sensitive to ultraviolet so let's stop this, [INDISCERNIBLE 0:32:01] is

usually three or four days but the stuff that's in the plant is far more and there was actually even studies in the last six to eight months, the levels that these plants are putting out are so much higher that's ever sprayed, there are thousands of times higher, that's suggestive, it doesn't prove anything. So all that work is that it just says there's [INDISCERNIBLE 0:32:20] question, we need to look at this further to see if this is happening in other things, what would be the impact of that? We need to look at that.

Female: Dale?

Dale: And regarding--go back to study--regardless of the source of the BT, doesn't that--doesn't it disprove something in the industry was--have been saying that BT is eliminated in the gut and this [INDISCERNIBLE 0:32:43]?

Michael Hansen: Oh yeah, yeah that's actually--I can show you other [INDISCERNIBLE 0:32:45] studies, there have been [INDISCERNIBLE 0:32:46] studies, there is a series of five or six papers that are done by Dr. Vasquez Fedron [SP 0:32:49] and colleagues, this is Cuba and Mexico and they've clearly shown some of these [INDISCERNIBLE 0:32:57] proteins, they can actually survive digestion particularly [INDISCERNIBLE 0:33:02] and if you talk to scientist, there have been scientists who have eaten some of the BT corn and then taken these strips that--that used to--to look for the protein and they can--they can detect it in [INDISCERNIBLE 0:33:14] so most of the studies,

the--the way they did them to say that it's digested is they took BT just by itself, they added a digestive enzyme and there was this expert consultation that basically said the ratio of the enzyme to the thing they are looking at should be about 1.3 to 1, well what Monsanto did is they used a thousand full of higher levels of the digestive enzymes so it made it look like the protein was digested within 30 seconds, that's not really a very big test. So that was actually a technical issue and that got deal with, there was an expert consultation on [INDISCERNIBLE 0:33:54] place in 2000, normally if I have enough time I go through the data from there but--and I also haven't talked about--there's actually [INDISCERNIBLE 0:34:04] data on these [INDISCERNIBLE 0:34:05] proteins that suggest not only that their allergens--well they have immunogenic effects and some of that is in here and if people want more [INDISCERNIBLE 0:34:14].

Female: Thank you. Dr. Hansen [INDISCERNIBLE 0:34:19] question so [INDISCERNIBLE 0:34:22] questions and you are [INDISCERNIBLE 0:34:24] for--Linda do you want to--

Michael Hansen: Yeah I'm here because I'm going to speak to the senate committee. I'm going to be here all day tomorrow. My flight is supposed to leave from 7:30 p.m. but I have the sneaking suspicion [INDISCERNIBLE 0:34:39] back to New York. So any questions you have, tomorrow I have a bunch of cards, people take them, call me, do whatever you want, any question that

hasn't been done here, any other things, that you hear some [INDISCERNIBLE 0:34:52] argument, I can--tell me and I can help you with the response. I've been doing this for enough years, I know it all [INDISCERNIBLE 0:35:00].

Female: Do you want to call the speakers off [INDISCERNIBLE 0:35:03]? Any other questions?

Female: Yeah. Has anybody sued the USD--the FDA for inaction of this?

Michael Hansen: Yeah, there's actually been two that would say lawsuit a number of years ago that a bunch of religious folks did and it was also run by the Senate for Food Safety and this alliance on bio-integrity [INDISCERNIBLE 0:35:33]. That suit wasn't successful basically because they said the FDA didn't have a [INDISCERNIBLE 0:35:42] policy and that was one where they argued [INDISCERNIBLE 0:35:45] since there was a defensive something act and what was useful about that court case is in the course of discovery all these documents came out and they were all the documents where the internal scientist were all saying there is a problem, this food should be regulated differently. They headed the--the Center for Veterinary Medicine, there's actually [INDISCERNIBLE 0:36:06] mandatory safety assessments because [INDISCERNIBLE 0:36:09] are going to be almost the entire [INDISCERNIBLE 0:36:11] animals. So there was a lot of useful stuff that was not successful but at times they've changed--the US used to argue that there's no reason

that these things aren't different, they are [INDISCERNIBLE 0:36:21] substantially equivalent. That's what they tried to get accepted globally at [INDISCERNIBLE 0:36:26] that was what that [INDISCERNIBLE 0:36:26] what they lost that one and they tried to stop this label [INDISCERNIBLE 0:36:31] 15 years that they tried every [INDISCERNIBLE 0:36:34] and they were able to--

Female: Has anyone tried to get [INDISCERNIBLE 0:36:37]?

Michael Hansen: What do you mean?

Female: If these are not any different, I mean can--is there a ground--

Michael Hansen: No that's what--that's exactly--no, that's what we pointed at--at--at the first meeting at--in--in [INDISCERNIBLE 0:36:51] back in '95 they were getting up and saying "There's no difference" and then it's--how come when it comes to labeling and safety, you see there's no difference between an engineered plant and a non-engineered one but then you walk across the street to a [INDISCERNIBLE 0:37:05] office and say "These are so new and uniquely different that we need new forms of intellectual property that have never been given before" so which [INDISCERNIBLE 0:37:12] if they are not different, give up those patents. But if they are different, then got a safety task and [INDISCERNIBLE 0:37:19] label, so they speak out of both sides of their--

Female: But that hasn't been challenged?

Michael Hansen: No.

Female: [INDISCERNIBLE 0:37:24].
Michael Hansen: Well actually yes. There actually have been some challenges on gene [INDISCERNIBLE 0:37:29] and whether those things should be [INDISCERNIBLE 0:37:30] and there are a couple of cases that are going up for the--to the Supreme Court which could fundamentally overturn [INDISCERNIBLE 0:37:38].
Female: Which would hen actually--
Michael Hansen: Which would actually have a [INDISCERNIBLE 0:37:42].
Female: Not be helpful in this arena right?
Michael Hansen: It would not be helpful to the industry because they couldn't--because the whole buy up of the steed industry and all these consolidation is only because they are able to [INDISCERNIBLE 0:37:50] these things, because under the previous plant--plant breeders rights, there was always exemptions for farmers and researchers. Farmer could do whatever they want with seeds. They could safe them, they could bag them, sell them to the neighbors and [INDISCERNIBLE 0:38:02] they could do whatever they want just like scientist could and that way, you can't control things that's why they need to get the industrial utility [INDISCERNIBLE 0:38:12], they get that here in 1985, the buy ups of the seed companies by Monsanto, it doesn't happen until '97 or '98 because they had to get things agreed at--globally under WTO, the [INDISCERNIBLE 0:38:23] provision [INDISCERNIBLE 0:38:24] intellectual property rights. So that's

why that was key and right after that decision is made, the following year, Monsanto spends a billion dollars buying up seed companies, they are now the largest seed companies in the world.
Male: Michael we have to go now--
Female: No, I have Linda Collins [INDISCERNIBLE 0:38:39] when the phone rings [INDISCERNIBLE 0:38:43] speaker off so the time--hang around so why don't you use the time wisely to have [INDISCERNIBLE 0:38:51] question.
Male 2: Yeah and the case you mentioned where FDA documents had to come out [INDISCERNIBLE 0:38:59] you mentioned the veterinarian. Is that the veterinarian that was forced out of the FDA?
Michael Hansen: No. You think about--that's [INDISCERNIBLE 0:39:06], that's actually Richard Burrows who was one of the whistle blowers for RBGH [SP? 0:39:10], no that's a different case and actually I think it's www.llianceforbiointegrity.org, there's a website, many of the lead documents, all the ones where the FDA said yes there are differences [INDISCERNIBLE 0:39:21] problems, those are all posted and if people want those, I can give you the URLs.
Female: So it seems like if you are trying to establish a state interest here, there are at least two that I see and one is health and the other one is environmental. If these BT corns or [INDISCERNIBLE 0:39:42]--
Michael Hansen: Actually I didn't even get into it because I

didn't have the time but when I do longer talks, what's more important than that is the [INDISCERNIBLE 0:39:49] crops, they are virtually all glyphosate, they have created an epidemic, there's now globally 23 [INDISCERNIBLE 0:39:55] that are resistant, we have 14 of them here in this country, they cause massive amount of economic damage and they led to over a ten folding--increasing the use of glyphosate and I can show data on glyphosate that shows that it can cause birth defects, that's a data from [INDISCERNIBLE 0:40:13] studies and then we have [INDISCERNIBLE 0:40:15] work that was just done last year and there's all these epidemiology that's spent on linking this to non Hodgkin's lymphoma. So the whole argument [INDISCERNIBLE 0:40:26] you are getting higher levels of glycosate through all these enhanced use, now that all these weeds are resistant, what they are doing is the new props are coming on the market as they want 24D tolerant corn, 24D tolerant soybeans and [INDISCERNIBLE 0:40:38].

Female: Can you talk a little bit about 24D?

Michael Hansen: Yes, 24D is a [INDISCERNIBLE 0:40:43] it was [INDISCERNIBLE 0:40:45] because when it was combined there's 245D, that's [INDISCERNIBLE 0:40:48] that was sprayed in Vietnam and when they first started engineering these plants, the idea was we use a benign or we say--like glycosate so then we don't have to use these nasty [INDISCERNIBLE 0:41:01] like 24D and others, now that the weeds have become resistant, they are going

back to the nasty [INDISCERNIBLE 0:41:06] and there's also been an increase in atrazine use. Atrazine is a [INDISCERNIBLE 0:41:11] it is an endocrine disrupting compound at 30 times below the level that's allowed in drinking water, you could raise leopard frogs in that solution and you can get mails that have [INDISCERNIBLE 0:41:25] and they didn't have [INDISCERNIBLE 0:41:27] themselves so--

Female: Other question for Dr. Hansen? Yeah John.

John: One other question comes up regarding environmental--possible environmental impacts of these products, since this bill is not addressed environmental--or the use of the products just labeling, how could we logically use environmental effects as a state--

Michael Hansen: Well you wouldn't be able to use environmental effects but just like with [INDISCERNIBLE 0:41:58] what you could use is potential human health impacts of the environmental effects and that's how you would get to the increased levels of glycosate having to be used and the increased pesticides that--that herbicides that have to be used on these crops, they would increase this pesticide residues and that could be a potential health issue. Yes you couldn't touch the en--environment issue but there's potential human health implications of--some of those and environmental impacts and that would be the compelling state interest because it probably would be more of a stretch for--and environmental effect but

[INDISCERNIBLE 0:42:39].
Female: But I think what he is getting at is we are not banning that.
Michael Hansen: No.
Female: So they are going to continue to be used and they--any environmental or health effects from the increased use of the other pesticides and herbicides because they become resistant, it's still going to go on whether--
Michael Hansen: Right and--but--but with labeling you have the chance to be able to detect it because--because what the other side would say is--they said "Well look, kiwi fruits came in." We know there are people--there are people allergic to kiwis. There's--you don't have to label them so why should we have to label GE foods? And there's a fundamental difference there because if you are allergic to kiwis the way you find that out is say [INDISCERNIBLE 0:43:18] you have a reaction. What--what happens is you have to eliminate everything from your diet for 24 to 48 hours and then you bring foods back in one at a time. When you react, you find out what you react to so kiwi fruits you'll always react to them. Say they took that gene from a kiwi fruit, put it into a tomato right? And eat a pizza, mixture in pizza, you'll have a reaction. When you are then doing the recall, when you bring the tomatoes back in your diet, if it's not the one with the kiwi gene you won't react to it so it makes it virtually impossible to tell whereas with the

regular allergen, you can always react that's why it has to be labeled because if it's causing something, you're never going to know. That's why you have to have label and that's the only way that you can potentially track things. There's still a problem with tracking but without that, you have no idea. So all these when they--when they say "There's no evidence that there are health problems in the--in the US population." My response is how did you know? You don't know who is being exposed to what so how can you do a scientific study to find out if there are any problems? I can show you that allergies to soybeans or allergies in general having [INDISCERNIBLE 0:44:24] two-fold in--in--in the last 15 years, does that have anything to do with GE? Who knows? You have to do a study.

Female: It's time.

Michael Hansen: That's the problem [INDISCERNIBLE 0:44:37].

Female: Dr. Hansen we really thank you. And again [INDISCERNIBLE 0:44:42]--

Michael Hansen: [INDISCERNIBLE 0:44:43] anybody please call me if--if you need anything. Anything I can do to help.

Female: And when are you [INDISCERNIBLE 0:44:48]?

Michael Hansen: 10:00 to 10:30.

Female: Is--as you are getting [INDISCERNIBLE 0:44:58] you see any similarities between--or amongst bananas [INDISCERNIBLE 0:45:04] kiwis, are there--is there anything analogous?

Michael Hansen: To what, bananas, avocado--

Female: Bananas, avocados and [INDISCERNIBLE 0:45:11].

Michael Hansen: They are all different, they are all good.

Female: Yeah but I mean--but someone I know has a reaction to those particular--

Michael Hansen: Those combinations, those are different things.

Female: Yeah, well don't think about it, you got to go see the speaker but--

Michael Hansen: There's--

[End of recording]

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Robbins, Russell, Englert, Orseck, Untereiner & Sauber LLP

02 Track 2
Female: [INDISCERNIBLE 0:00:01] on H112, and if there is a way to [INDISCERNIBLE 0:00:08] engineering meet Andrea Stander from Royal Vermont.
Andrea Stander: Thank you good morning.
Female: Good morning.
Male: Good morning.
Andrea Stander: Again my name is Andrea Stander. I'm the Executive Director of Rural Vermont. I think most of you on the committee are familiar with who we are. I wanted--I'm--I'm here today on behalf of Rural Vermont but also it's important for you to know that Rural Vermont is one of the coordinators of the Vermont Right to Know GMO's Coalition so I'm here on behalf of that coalition as well. You'll be hearing from other members of the coalition later. So thank you for the opportunity to testify and support of H112. I also want to thank the committee for all of its work last year and this year on this really crucial piece of legislation. I'm here to speak on behalf of Rural Vermont's members. They want to know--they want the right to know whether the food they eat and feed their families has been genetically engineered. Rural Vermont has a long history working on the issue of genetically engineered food and agricultural products and it's important to note that our concerns as an organization are much broader than the scope of this bill. We have a lot of other concerns. But we feel that

this bill is very important because it affects all of our members. In fact it affects everyone who eats. Our members are farmers and eaters and they are committed to building a community-based food system that is grounded in regenerative farming process methods and supported by knowledge and trusting relationships. One of the biggest concerns of our membership is the ever expanding control of our food system by large multinational corporations that are committed to monoculture farming using product that they control. Our members see that expanding corporate control threatening the diversity and therefore the security and sustainability of our food system and this is where it comes down to labeling. If we don't know whether our food has been genetically engineered, we can't make choices that are based on our health needs, on our concerns for the environment and on our concerns or our values. So now I wanted to share with you a few questions that I hear most often from our members and that we hope the committee will consider as you deliberate on this bill. Why is there no independent testing of the safety of genetically engineered foods and products? If they are safe, where is the proof? Why do 60 other countries require labeling or place other restrictions on genetically engineered food props and products and the United States does not? And why are multinational corporations spending so much money to prevent consumers from knowing whether their products are in our food? Rural Vermont urges this

committee to put these very serious concerns and the needs of your constituents ahead of the interest and the threats of corporations that profit hugely from denying citizen's freedom to choose food that meets their health needs and is consistent with their values? And I'm happy to take any questions that the committee might have either about the bill or about our involvement with this legislation. I'm not here as an expert in any capacity other than just representing our member's interest.

Female: Okay. Question for Andrea? So Sylvia did you have a question?

Sylvia: Well sort of and I don't know whether this is just too broad or [INDISCERNIBLE 0:04:27] talking about but I don't understand how the--how the FDA actually okays labeling? I mean do they actually test every product that comes out on the market before or how--I don't understand how that works.

Andrea Stander: Well I--I would--I know that you weren't part of the committee last year.

Sylvia: Uh huh.

Andrea Stander: And there is testimony in the record that is available and referenced that's far more detailed than I could offer but my understanding from having heard that testimony is that in the case of genetically engineered products, the system that is in place is one in which the FDA accepts testing results from the corporations as the only testing that is on record. They--we heard testimony last year from a representative of the

FDA who said that they have no resources, no money, no funding to do that kind of independent testing and there's the further complication that any independent scientist who might want to do testing or examine these products is generally prohibited from doing so because they have to get permission from the company in order to access the material that they would need in order to do any testing. So we have a kind of closed loop here that really prevents any outside scrutiny of whether or not these--these products are safe and I have to tell you that people ask me all the time, they said "Well if it is safe, if there is nothing different, if there's nothing wrong then what's the big deal about putting a label on it?"

Female: We actually--we actually heard a testimony from Michael Hansen. I don't think he [INDISCERNIBLE 0:06:20] for it Cynthia [SP? 0:06:22] on Friday and he talked about the fact that the FDA doesn't [INDISCERNIBLE 0:06:31] that they really on the independent testing done and paid for by--well their independent labs--independent labs that do the testing is paid for by the companies that--whose products they are.

Sylvia: Okay, thank you.

Female: And I really recommend--was it Rural Vermont that was taping--videotaping the presentation?

Andrea Stander: Yeah we do--we--we do have Michael Hansen's presentation and we're--

Female: Would you be willing to let--

Female: Was it here on committee--
Female: Yes.
Andrea Stander: Or actually it's on--he was in this committee on Thursday I believe, last [INDISCERNIBLE 0:07:09] yep, right.
Female: Could you [INDISCERNIBLE 0:07:11]? Whatever--
Andrea Stander: We do--we do have--we do have videotape of the testimony.
Female: Would--would you be willing because I've said to Cynthia she went through this very fast. We didn't get an opportunity to meet with the speaker and so we turned a one and a half hour presentation to an hour presentation and it's--it's somewhat complex, it's about gene theory and--and you know, gene theory 101 basically. So if you could lend Cynthia a copy of the DVD--
Andrea Stander: Sure.
Female: So she can review it and see what he was doing in the board. I think that would really benefit you.
Andrea Stander: And any--and any other member of the committee who would like to see it again or didn't get a chance to see it.
Female: [INDISCERNIBLE 0:07:54] extra copy.
Andrea Stander: Yep, uh huh, I'll--I'll take care of that, yep. I can definitely get that for you.
Female: Okay, Harvey.
Harvey: Yep. How much time [INDISCERNIBLE 0:08:03] understand and the--FDA allows for labeling for GMO-free labeling? Well

what's the difference between the two approaches--
Andrea Stander: There no--there's nothing in the law to prevent someone from putting a label on something saying that it's GMO free. However, it is extremely difficult because of the scenario we just described for any producer to be absolutely sure that their product is GMO-free. The kind of testing that you would have to do to be able to make that claim is very, very expensive. There's a limited number of places where you can do it, I mean the non-GMO project which does a certification process if a food producer wants to get their certified label on their product is extremely rigorous. I mean it holds a very, very high standard. I mean fare higher standard than this bill requires in terms of not allowing any trace ingredients and things like that. So it can be done but it's an extremely onerous and expensive process for a food producer to go through that to label something that's being GMO-free. It's far easier at this point to trace where the GMO products are and to acknowledge that they are in the food than it is to insure that they are not.
Harvey: Well we had--there was an announcement a week or so ago about, again [INDISCERNIBLE 0:09:43] they are coming to [INDISCERNIBLE 0:09:44] later on but they said that 27--I think it was 27 [INDISCERNIBLE 0:09:51] GMO-free.
Andrea Stander: Uh huh.
Harvey: So if they can do it with the broad reach I guess of

their ingredients, you know where they purchase their ingredients I'm--I'm wondering how onerous it would be but then--and if they can do it why couldn't others do it? I mean I'm--I'm trying to understand how the process works.

Andrea Stander: Well I--I--I think they can speak to that more specifically when they come in to testify and I'm sure you'll hear some details about how they reach the conclusion that they could do it and what it is that they are going through in order to achieve that goal but what we've heard from a lot of small producers is that they make the commitment at the outset to source ingredients that they are--they know are free of GMOs. So they are either buying organic or they are buying--they are using ingredients that are not known at least at this point to be genetically engineered in any fashion. And that you know there's a--at the moment there's a relatively narrow list of things that are commonly in the food system that are genetically engineered. It's about 80 something percent of corn, 90% of canola, some high percentage of sugar bits and a number of other things. But if you start to look at the ingredients on any label, you will find one of those things listened somewhere and it may be a derivative of some sort, things like [INDISCERNIBLE 0:11:24] those kinds of things are all derived from the original product soy, corn, canola and then manufactured in some way but at this point, it would be very difficult for someone who was just sourcing their ingredients to test every single one of

those ingredients to be sure that they are not genetically engineered.

Harvey: Well they have to be tested by their company or for the--just come with some kind of a letter of certification that they were free?

Andrea Stander: Well in the bill actually it provides in that and that a retailer who is selling product can rely on a certification from their source so wherever they are buying the product from is having certified that it was not genetically engineered and they can depend on that affidavit as their proof that they have complied with the law. But to flip it on the other side and say that someone has to go out and do the testing themselves especially if it's a small producer to test those ingredients in order to be able to say with any credibility that their product is GMO-free I think would be very, very onerous.

Harvey: So you are saying under the FDA rules, an individual couldn't use a letter of certification but they would have a cast to verify even though they have the [INDISCERNIBLE 0:12:49] certification?

Andrea Stander: Well it's kind of the Wild-Wild West as far as that goes right now because there are no laws about labeling something as GMO-free. In fact there's a lot of things right now that are carrying a GMO-free label that if you look closely at the ingredients you will discover that they do have ingredients that contain--most likely contain GMOs because there

is no requirement.
Harvey: When we went there, I mean we heard about the proof of label and then the fact of the matter is you can put something on the label that is truthful, so I [INDISCERNIBLE 0:13:21] even though they have an ingredient that may say you know, have some derivative from corn and we know that 85% or so is based on GMO produced corn but they put it on a label that is GMO free and it has that in it, I assume that here will be some liability on part of that company or putting that on that label.
Andrea Stander: Yeah that's why it's so onerous to label with GMO-free because it's really hard to know you know if you are--and if you are an independent you know producer and you are trying to figure out if your ingredients have any genetic engineering in them it's not a easy thing to do.
Female: I'm sure we got testimony from LA for--about--you are actually using the term GMO-free and you can't just do that. There's certain rule that we should probably have [INDISCERNIBLE 0:14:16]. Yeah, Cynthia.
Cynthia: Yeah so--do we know? I mean you mentioned that list of--and to me this list of ingredients that is usually on a legal like [INDISCERNIBLE 0:14:28]. Do you know that some of those things are genetically [INDISCERNIBLE 0:14:34]?
Andrea Stander: Well you can only--
Cynthia: Wait--
Andrea Stander: You can only sort of presume of 80% to 90% of

the corn that's in the processed food is genetically engineered and [INDISCERNIBLE 0:14:42] is a derivative of corn. Chances are, you know if it doesn't say that it's organic or something then you really don't know, you can't be sure.

Harvey: [INDISCERNIBLE 0:14:53] is there many of the--the food labeled names don't say "This is derived from corn" or "This is derived from soy" but there are dozens of products that are used in the manufactured food industry, the product from just several basic sources, most of which are from [INDISCERNIBLE 0:15:09].

Andrea Stander: Yeah, corn, soy, canola and sugar beets are the source of many, many, many, many of the small ingredients that are in processed food.

Female: So I got a list Cynthia that you might want to look at and this is a following--it's a list of additives that may be derived from corn or--or soy beans, things like ascorbic acid, citric acid, glycine, glyceride so you know it's marched by a piece of yarn and [INDISCERNIBLE 0:15:39].

Female: Question for Andrea. Dan?

Dan: Yeah. This is a hard one because it touches on--it touches on several different levels in that and it gets back to my philosophy for feeding people and I guess--I wish that the organizations or companies who have--or producing genetically engineered seed would not put these roadblocks out in terms of [INDISCERNIBLE 0:16:47] verification, that in itself as far as I'm concerned leads the [INDISCERNIBLE 0:17:01] something that

should be hidden and at the same time, I respect Rural Vermont and its membership and its positions but how--In the broader scope of things, how do you--what--what is your mission in terms of--of feeding the world? We can't really do it any other way and [INDISCERNIBLE 0:17:55] feed Vermont.

Andrea Stander: Well I think that's a debatable point. I wouldn't agree that that's a forgoing conclusion, that that's the only way that we can feed the world and particularly if the health concerns that a lot of people have because of what you mentioned which is that there is a lack of independent testing, there's a lack of proof that these products are in fact safe, it doesn't lead me to the conclusion that this type of food source is what's going to be the solution to feeding the world and I think that the concerns of our members are that many of the things associated with this industry are leading to some fundamental directions that farmers know from their own direct experience on the land are really contradictory to creating a sustainable source of food. Monoculture, use of pesticides, depletion of the soil which all gets beyond the scope of this bill but I think that what's driving this is that people need to know--Pardon me. Sorry. People need to know there are enough concerns, there are enough issues of values, of religious beliefs, of health issues that this information is needed by the public and then they can decide. They can decide what they are going to buy and what they are going to feed their families and

that's really what the bill is about, is offering people that opportunity, offering Americans, Vermonters the same opportunity that 60 other countries are now offering their citizens and I think there's got to be a reason why there are 60 other countries that have chosen this route including China, India, places where starvation and food you know is a far more dire situation than it is in our country and certainly in our state. So I don't know if that answers your question or not but this is what I hear from our members on a daily basis is that if they are going to make choices about how they are going to feed their families, they need this information.

Female: Were you [INDISCERNIBLE 0:20:28]?

Dan: I can be.

Female: [INDISCERNIBLE 0:20:34] to the next question and then we can go back to you.

Male: I think part--for me, part of the reason that this bill is so important is because people don't know [INDISCERNIBLE 0:20:46] assuming that's part [INDISCERNIBLE 0:20:48] but what I'm wondering, you mentioned we keep hearing over and over again that religious groups [INDISCERNIBLE 0:20:56].

Andrea Stander: Uh huh.

Male: Can you surmise why they are so quiet in the issue? Why they don't raise a bigger [INDISCERNIBLE 0:21:06] think about it as a group? It seems like there's more than--it's not like there's just--you can point and say it's just this group that

[INDISCERNIBLE 0:21:15].
Andrea Stander: No it's pretty widespread.
Male: And I think Jewish and Christian and I--I don't know what else, because they--they're quiet.
Andrea Stander: I don't know other than the fact that for many religious groups and getting involved in political activity is something that they just don't do. They don't become active in that way partly out of restraints that are on their--you know, nonprofit status and things like that. I do know that we are working to bring forth for the committee representatives from some of those communities and Vermont to--to testify to the--the--the decisions that have been made and proclamations and other statements of faith that have been made by different communities on this issue. But I think at the bottom of it is you know, food is very fundamental, I mean is anyone in this room not eat? I mean--
Female: [INDISCERNIBLE 0:22:12] you know--
Andrea Stander: No, but--but I think--I think it sounds silly but--it sounds silly but I think we have to come back to that that food is--food is something that we--we are involved with on a daily basis. It is fundamental to our survival, what we choose to eat has a big impact on our health, it has a big impact on our personal economy and for the members of Rural Vermont who are farmers, who are striving to offer Vermont a food system that is truly based in the community is truly based

on knowledge and trust where people know where their food is coming from, they know how it was grown, they know what went into it. I think that there are some fundamental beliefs there about what people ought to have the right to make choices around and this is a fundamental roadblock right now that you know, I do it. I picked up a bottled salad dressing off the coop shelf last night. I was going to have dinner with friends. I saw it local made you know, right here in Vermont. I picked it up, I took it to my friend's house they said "What have you been up to with the state house?" I said "I'm working on the GMO labeling bill" and just idly I picked up the bottle and I looked at the back of it and we had three ingredients that I knew were suspicious. So I mean--and--but I don't know for sure. I can't know for sure so that's the fundamental problem that we have right now and I think that the political problem that we have, a tremendous pressure from the corporations who produced these products, I mean the fact that these corporations and the distributors of the food that they purvey spent you know millions of dollars in California to insure that a proposition that would simply allow people to know whether these you know products were in their food is cause for a concern, that's real cause for concern that our fundamental you know right to know what we are eating is being prohibited.

Female: Dan, did you have a follow up?

Dan: No. I think I'll follow up in our committee discussion,

thank you.
Andrea Stander: And I will--if--I just recently came across an article but a--an award winning science writer who catalogues seven questions that anybody who is looking at this issue should consider and I'd love to pass that along either to you individually or to the committee if you are interested.
Female: Sure [INDISCERNIBLE 0:24:57].
Andrea Stander: I just--it just came across my desk two days ago and--yeah, yeah.
Female: Make one copy available and [INDISCERNIBLE 0:25:02] for all of us.
Andrea Stander: Okay but I'll be happy to send it directly to you Dan.
Dan: Thank you.
Andrea Stander: I think it might be helpful.
Female: Dale?
Male: Yeah, Andrea, 60 or some other countries have required labeling or have other restrictions, do we know--do we know what reasons--how they were able to enact those and--and why?
Andrea Stander: That's just a quick map that someone sent me this morning. Do we know why or how?
Male: Yeah, why and how.
Andrea Stander: I think my understanding and you know there's a lot of history involved with these different countries and how they went about it but it grew out of the same basic issues that

we are talking about here which is that their citizens raised concerns based on their experiences. Their farmers race concerns and they began the process, I think what's important to know is that many of these countries had a much easier lift on doing this than we have here in the United States because they don't have the patent laws that we have in this country.

Male: So they are able to do testing and those tests have shown constant--

Andrea Stander: Well there is testing. It's still pretty restricted because they are still trying to get a hold of the same material in order to test it but they don't have the patenting laws that--and the court history that we have in this country that have so constrained the ability of both the public and government to gain access to the information and to pass laws that impact those companies. I mean in most cases you know the companies that are operating there, they are either labeling or they've resourced their ingredients so they don't have to label. So it can be done.

Female: Okay.

Andrea Stander: Thank you.

Female: Thank you very much.

Andrea Stander: Thank you.

Female: [INDISCERNIBLE 0:26:56] that article.

Andrea Stander: Yeah I'll send that [INDISCERNIBLE 0:26:58].

Female: Basically [INDISCERNIBLE 0:27:01] businesses for social

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Robbins, Russell, Englert, Orseck, Untereiner & Sauber LLP

Carolyn Partridge: Because we had planned to work until 1 o'clock and we do have a little time here, I would invite you and we would also -- because we did miss some of your testimony, I would invite you to testify if you'd like to at this time. I don't want to put you on the spot but please, feel free to testify.

Dr. Giddings: My privilege.

Carolyn Partridge: Thank you very much and if you could direct your testimony primarily to the bill that we've proposed which concerns the labeling of genetically engineered food, we'd appreciate it.

Dr. Giddings: Sure. What I do -- first let me give a little background myself to some of those who may not have been in the previous meeting and I'll try to give a very short summary of what I said there, and I'll be happy to respond to questions that you might have.

Carolyn Partridge: Can you just say your name to start with and what you do?

Dr. Giddings: My name is Val Giddings. I am geneticist by training. I spent 15 years advising Congress on these very same issues and of that 15 years, a decade of that time, I spent conducting risk assessments of transgenic crops for USDA so I've got a lot of experience as a regulator in Washington and then for the last 15 or more years, I have worked primarily as a consultant, advising governments and countries and companies,

and multinational organizations around the world on these issues. My training is primarily as a scientist. I have worked as a policy expert on these issues for the better part of three decades. I was asked to come up here and talk with you folks today to enable you to ask questions of somebody with that kind of experience and background.

Carolyn Partridge: And where do you based at this point?

Dr. Giddings: I am based in Washington, DC. I work out of my office in Silver Spring, Maryland and I am a senior fellow with the Information Technology and Information Foundation (ITIF) which is the think-tank in Washington that's devoted to issues associated with economic growth, innovation and policies that [INDISCERNIBLE 02:05]. In the testimony I gave earlier, before the Ag Advisory Committee, to summarize very briefly, I said that my concerns about the legislation you are contemplating, I've read it, I've read carefully. I've seen numerous examples of this kind of legislation before and my concerns are primarily that this kind of legislation often winds up having the opposite effect of that which it's intended to provide. Laws like this have a track record of not providing information for consumers that they can't in other ways. The information that is mandated in this bill actually lands a very misleading impression about what the facts are with respect to crops and fruits of biotechnology and the foods derived from them, and this sort of legislation typically winds up as we have seen in depriving

consumers of choice, not expanding their realm of options. Consumers today already have an option to avoid foods derived from crops and fruits of biotechnology, if they choose to do so they can buy organic food which precludes the use of genetic engineering techniques in organic production. So they already have freedom of choice. The issue is often raised that consumers have a right to know and therefore we should put the information on the label as to whether or not the foods contain material derived from GMOs. Nobody can dispute or argue against providing consumers with the information. I think consumers do have a right for information but the practical question becomes how do you put on a label everything that consumers want, because if you ask some consumer, do you want X, Y or Z on the label, invariably they will tell you yes. They are never going to say, "I don't need to know that," or very rarely they'll say, "I don't need to know that." So the Food and Drug Administration which sets federal policy on labeling requirements has a dilemma. They can't put an encyclopedia on the label. They could but then you couldn't read it, it would have to be such small print. What do they require you to put on the label? What the FDA requires on labels is information that is relevant to health, safety and nutrition. If the data do not show a link between the food and its characteristics that is relevant to health, safety and nutrition, then FDA is not going to require to put it on the label and they have on the basis of

the experience and the data which are massive to date. They have concluded that the use of recombinant DNA technologies to produce crops that we speak of as genetically engineered and the foods that are derived from them tells you nothing at all necessarily about the safety or the health or the nutritional aspects of those foods, and so they don't require that a GE label be included on foods derived from those materials. In addition to requiring that the mandatory information content on the label irrelevant to health, safety and nutrition, FDA also requires that whatever you put on a food label, even if it's not what's mandated to be there, the initial information must be accurate, informative and not misleading and the problem with labeling bills of the sort that you see before you is that many of the most enthusiastic proponents of this legislation have made very clear that it is their intention to use that label to enable consumer boycotts to try and drive GM ingredients out of the market place because they believe they are not safe. Their motivation is abundantly clear. I quoted one of those individuals this morning. The track record in Europe where these labels are mandated has been very clear, with the exception of the Netherlands, it's very hard to find food in Europe on the shelves that carries these labels because the propaganda and fear campaign that has been used to raise unjustified concerns about the potential health or safety consequences of eating these foods has raised a great background

of concern and food producers in Europe in order to insulate themselves from the boycotts that have been engineered have voluntarily reformulated their products in order to avoid to carrying the label which others have used to stigmatize these foods despite the fact that all the data that we have show that the only cases that we were even able to detect scientifically differences in terms of health or safety with these foods and conventional foods favor the biotech foods. The biotech foods are shown to be safer and I can talk about that at great lengths, I would be happy to do so but maybe I should stop and let people ask questions, if you'd like.

Carolyn Partridge: Okay, questions for Dr. Giddings? Teo, what is your question?

Teo Zagar: Harvey, go ahead. I saw you raising your hand first.

Harvey Smith: No, I just had a question that would inquire about the lack of testing or investigation by FDA and when you introduced yourself you were talking about you get some review -- was it review of these products?

Teo Zagar: The USDA.

Dr. Giddings: When I worked for the US Department of Agriculture, I spent a decade doing risk assessments of crops and fruits in biotechnology. I also have spent 20 years working very closely with my colleagues at FDA and what proponents of this legislation and critics of biotechnology in general often

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Carolyn: Okay. And how would you know whether they were toxic or allergenic?

Robert: Quite often what the practice for that is there is a battery of studies that are done mostly in that case bioinformatics. So, very--the sequence of the new proteins being added to the food with those of all the toxins that are known or all of the allergenic proteins that are known and if there is less than a 35% identity between the new protein and the known toxins or allergens that considers the likelihood for toxicity or allergenicity as very low. For toxicity, also in many cases the purified proteins are actually tested in animals to see whether those proteins are toxic.

Carolyn: Okay. Dr. Merker, I guess, my clerk has reminded me that I actually didn't have you introduce yourself, your name and what your position is. So, if you could that, I'd appreciate it.

Robert: Okay, my name is Robert Merker. I'm a Supervisory Consumer Safety Officer at Center for Food Safety and Applied Nutrition of the Food and Drug Administration in the Office of Food Additive Safety, and I am the lead on FDA's consultation program for new plant varieties.

Carolyn: Okay, thank you so much. I'm sorry to--so, I guess I would open this up to some questions from the committee, and I would just ask the committee to say their name before they start this. Our committee is new. Tristan?

Tristan: My Tristan Toleno. I just was trying to understand one aspect of the bioinformatics that you mentioned is the basis for making the assessment about testing, I'm sorry, about toxicity. And going back to when the initial decision was made in '92 on how to handle these products, one characterization that I've seen of a potential critic is that at the time of that '92 decision, a framework was set out that it wasn't generally assumed that a particular code of sequence would produce a particular protein sort of a one-to-one relationship. And that as the science of gene expression has evolved and our understanding has evolved, we now know that environmental conditions and other factors might lead to a one-to-many relationship between a gene sequence and gene expression and the proteins that are created. Is that at all fair a characterization and if so, does that sort of point to a question about the original framework under which foods where listed as grass?

Robert: Actually, no, it really has nothing to do with this because the types of things that you're talking about really tend to be more true of certain sets of genes in higher organisms, in the case of most of the genes that have been used in plant biotechnology. In most cases, these are genes that have been originally derived from bacteria. We know what the sequences are, the way they're being set up in the organism. There's really only one way for them to be expressed.

Tristan: Okay, thank you.
Carolyn: Questions? Okay. Teo?
Teo: Hi, Dr. Merker. My name is Teo Zagar. To sort of follow-up on the last question and get some more clarity for myself. Is what you're saying that in cases when insertional mutagenesis is used on crops that are commonly engineered that it's out of the realm of possibility that certain non-targeted genes could be activated or deactivated or is that a possibility?
Robert: It's not out of the realm of possibility, but the types of evaluations that we do pretty much minimizes that. So, part of the assessment is a full compositional evaluation which does give us the feeling for whether the overall nutrition and the expression of any potential toxins is in the plant have effaced and of course any of these things can also happen naturally and spontaneously as well as by the insertion of new genes. And I wouldn't necessarily call it insertional mutagenesis because while the genes are being inserted, in most cases, we know of no function that's actually disrupted in this particular situation.
Teo: You said in most cases. Have there ever been cases when--
Robert: Well, they well have been cases. The developments of this stuff tends to be rather complex than out of thousands of transformants, they'll usually end up with one transformant that they'll pursue, some to the end. And at least the assumption is that there are probably a number of the initial transformants

that may well have been inserted into an important gene. But for one of many reasons, it fails to come to the end. That it could that they are deficient in agronomic considerations or that they don't end up properly or for any number of things that can happen. But almost any of those claims could happen spontaneously particularly in a crop like corn for instance which is known to have spontaneous transposition occur.

Teo: Okay, thank you.

Carolyn: Other questions? Kristina?

Kristina: Thanks. Hi, Dr. Merker. My name is Kristina Michelsen. I'm curious about the beginning of your statements where you indicated that no regulatory body does its own testing and to take that the FDA doesn't do its own testing. Are you referring to food just biotech products or food, drugs, anything that the FDA regulates, you do not do your own testing?

Robert: The FDA will do testing for instance for contamination and things like that. But for approvals, that's all done through the manufacturer.

Kristina: For approvals of drugs and all food products?

Robert: Yes, for approvals of drugs and medical devices.

Kristina: Okay, thank you.

Carolyn: And is there some kind of difference because we've been lead to believe that additives, colorings, what have you go through some kind of a different process. Is there some kind of difference in anywhere between--

Robert: Food and color additives do have an approval process that does end up with a regulation in the Code of Federal Regulations. The type of safety assessment that is done is still very similar and would be qualitatively the same. The difference is that there is a statutorily mandated process that these things go through a petition process where the agency has to evaluate the raw data from the testing that the manufacturers do.

Carolyn: Okay.

Robert: But the primary difference is the fact that we have to draw up a regulation which seems to go through our legal counsel and probably add another half year to the process.

Carolyn: So, that's food colors and what was the other?

Robert: Food colors and food additive. Well, not just food colors but color additives in food, in drugs, and in cosmetics.

Carolyn: Okay.

Robert: And medical devices for that matter.

Carolyn: Okay.

Robert: As well as food additive.

Carolyn: Okay. All right. So, can you say a little bit more about this risk assessment process?

Robert: Actually, it's not a risk assessment as much as it is a safety assessment.

Carolyn: Okay, safety assessment. Can you just say a little bit about that?

Robert: So, basically, there are two areas that we look at. The first is identity which is, you know, what something is and in some cases, that's the chemical. In the case of these bioengineered foods, we are looking at usually a new protein and in some cases products that come after the production of the protein and what the experiences with those proteins are. We often will be looking at animal studies or information about previous consumption in the cases of a protein. Generally, proteins are not toxic. So, we're basically talking about just very small classes of proteins that can become toxic. There are protein toxins that emanate primarily from some snake venom, from some pathogenic bacteria and we generally know the kinds of--the particular classes those fit into. They have certain similarities. And so based on the structure of the protein, we can kind of tell whether it's likely to be a toxin or not. In terms of the animal studies, generally, unless you're talking about one of those protein toxins that pretty much the largest amounts you can really feed an animal will still be safe. And that's how we determine the food safety of chemical substances as they generally get fed the animals first at levels that are toxic and then when we determine how much less than that you have to give to result in no effect on the animal. That sets as an acceptable daily intake only with the protein almost no matter how much can you give the animal they are toxic, so there really is no acceptable daily intake as proteins in general are

safe and they get digested. Does that help?
Carolyn: That does help. Kristina has another question.
Kristina: Thanks. I'm curious of the safety assessments that you make based on the data provided by companies. I'm not a scientist so forgive me, those indicate sort of an immediate cause and effect I suppose. You get information to say, no, this isn't going to cause some cow to drop dead or a person to drop dead or get sick immediately.
Robert: Actually, there are several types of studies that gets done. So, there are acute studies which basically only give a single dose of a substance. There are some chronic studies where they'll feed the substance to an animal repeatedly for a 90-day period and then do an autopsy on the animal and of course check the animals compared to controls that haven't been fed the substance, but have otherwise been treated identically. And if there aren't any significant differences, then it considers that the substance is safe. And so basically at first, with some of the more potent chemicals, you find what levels do cause cause and effect and then you back off of that in order to find a safe level. With the proteins as I said, there is no unsafe level. But as much of it as you can get into the animal ends up coming out as safe.
Kristina: So, basically a 90-day study is a long-term study?
Robert: A 90-day study is a mid-term study. A two-year study is a long-term study.

Kristina: Thanks.
Carolyn: John Bartholomew has a question.
John: Going on again about the manufacturers doing the testing, how is this reviewed if you got a study from the company about some new product?
Robert: Well, generally, again it's not really the manufacturers doing the testing in most cases. It's usually independent labs that the manufacturers contract to do these types of studies. And there are only a certain number of certified independent labs in the world and these are labs that stake their reputation on these studies.
John: And how are they reviewed when you get these studies?
Robert: We have trained toxicologists who know how to review these studies and, you know, these include things like the weights of various organisms, a pathology report, blood work, and our toxicologists know how to review these studies and know when there are things in the studies that would indicate safety problems.
John: And so they review things like the design of the study and looking at validity of the statistical test used?
Robert: Sure.
John: And so if there's a very large company, a biotech company, they wouldn't have the resources to do their studies inhouse. Some of the testimony we've had suggested that they do these studies inhouse or if you know scientist.

Robert: For the biotech studies, certainly the studies where they do things in animals are done by the certified lab. The molecular biology studies which actually demonstrate how much of the new substance is made, the new protein is made, and how much of the--and how the different pieces of DNA has been integrated into plant genome and whether it's stable and how many copies of the new genes there are. Those are the things they generally do inhouse. The compositional analysis is also something that they generally contract out.

John: So, if you're the manufacturer that is proposing a new product, can you take me through exactly what would that company have to do before they could put that on the market through FDA?

Robert: What they generally do is they'll come in and talk to us at the beginning and tell us what they're planning on doing. Then often, they will present their safety package to us. This will contain several aspects. This will contain generally the set of information that is recommended in the Codex of Alimentarius recommendations for food from recombinant DNA plant and that includes a discussion of the product itself, a discussion of what the intended effect of the new protein is, a discussion of the source or sources of the new proteins and the fact that those sources should neither be pathogenic nor allergenic, a discussion of the new protein itself--what it is, what it does, how it works. There then will be the discussion of toxicity of the new protein and whether there is any

likelihood for toxicity, which the answer is it is uniformly no, comparing it to sequences of known toxins. There is a discussion of the potential for allergenicity, which is taken based on Codex Alimentarius International Guidelines. It includes the bioinformatics assessment that I talked about earlier. It includes an assessment of digestibility both in the stomach and in the intestines using in vitro models. It usually includes a feeding study of the protein to show that there are no deleterious effects when very, very large amounts of the new protein are fed to animals. And then there is a compositional assessment that compares the levels of all the different components in the crop that are used as food compared to a non-genetically engineered but very comparable counterpart and also comparing it with no levels of the different components in other marketed varieties of the crop as well, as comparing it to levels in several internationally recognized databases. And after we review that and determine that it's potentially the same as other varieties of the crop with the exception of a few minor instances where we have seen compositional changes and where different labeling is required, we will write a letter to the company that basically says that we have no further questions about the safety or whether the new component would fit the definition of a food additive. So, part of the whole assessment that we do is determining that based on the data that they are presenting to us, we don't think that that new protein

fits the requirement for review as a food additive. We have had one instance in which there was such a protein that did fit the definition of a food additive in genetically-engineered crop.

Carolyn: And what was that?

Robert: That was in the original Calgene tomato. When they consulted with us, they wanted us to review the safety of the antibiotic resistance markers that they used in their construct and we did review it under the same strict standards that we review all food additives and found that it isn't neither toxic nor allergenic.

Carolyn: Okay. So, is it fair to say--this is Carolyn again, that the FDA does not have statutory authority to require labeling of foods produced of genetic engineering?

Robert: Not exactly, no. But it's fair to say that FDA cannot require things to be labeled differently unless there is a material difference between them.

Carolyn: But what I gathered, you don't find that there is a material difference.

Robert: In some cases, there is. That's why we've required that certain vegetable oil be labeled differently.

Carolyn: Okay. But I'm talking specifically about biotech, genetically engineered.

Robert: Well, that is for biotech things, but just labeling them because they are biotech as opposed to things that were developed using other methods. Unless there is a material

difference, we have no basis for requiring different labeling.
Carolyn: So, it sounds to me like there is a maybe a shade of grey there. The FDA does have statutory authority to require labeling of food produced with genetic engineering.
Robert: If there is a material difference.
Carolyn: Okay. Yes, Kristina?
Kristina. Yeah, this is Kristina again. So, the Calgene tomato, you actually--the FDA did its own testing for that?
Robert: No.
Kristina: Okay.
Robert: Calgene did the testing, but FDA did a complete review of the data and information.
Kristina: Okay.
Robert: Or I should say, Calgene had the testing done.
Kristina: Okay. And you had mentioned earlier that the FDA does do its own testing in a contamination event.
Robert: Yes.
Kristina: And can you tell us what that would mean and what's a contamination event?
Robert: Generally, under fairly random circumstances or particularly if there are known cases of people being made ill by food, the agency will recover some of that food and do testing of certain pathogens in order to try and recover those pathogens from the food so that the agency can take action against the purveyors of the food.

Kristina: Thanks.
Carolyn: Tristan.
Tristan: Hi, this is Tristan again. We have been talking quite about the protocol that you use in all the testing procedures that the independent labs and the companies go through, and I realize sort of what I thought maybe was lurking behind that question for us. And I found a connection to a meta study that was done in terms of pharmaceutical research a few years ago that show that there appeared to be a fairly significant statistical difference in the relative outcomes of studies that were funded by industry groups either directly or indirectly and those that were funded by the government in terms of the level of the positive reporting of those studies. And so I think what I'm wondering is clearly you have established a pretty comprehensive protocol for how you assess those testings. But is there any attempt to look at whether or not that well-designed protocol is actually producing statistically different results than completely third party testing might, as a meta study?
Robert: In most cases because these tests are actually done by independent lab I think. You could say they are done by third parties.
Tristan: But aren't they financed by the industry?
Robert: It's a Secret Service sort of thing.
Tristan: Right, I understand. So, that was I believe and I

maybe wrong about this that the meta study was looking at that as saying, you know, industry funded and not industry performed, but industry funded.

Robert: I can't speak for that because I'm not aware of this particular study.

Tristan: Okay. So, you don't have anything similar? You never looked at--there is no protocol for looking at a metaanalysis of whether your process produces different outcomes than a process that has no industry funding?

Robert: No.

Tristan: Thanks.

Carolyn: Teo?

Teo: Yeah, Dr. Merker, this is Teo Zagar again. I'm trying to understand the concept of materially different. I'm wondering how what the FDA definition of material different is because I guess what I'm confused about is if one crop is expressing a protein that doesn't exist in a non-genetically engineered crop without that protein, why that new protein doesn't make it materially different?

Robert: Okay, for one thing, in a lot of these cases, the new protein doesn't even appear in the part of the crop that we eat.

Teo: Is that in the case of corn?

Robert: And even when it does, it is present at very, very, very low levels. We're talking about nanograms.

Teo: So, where is the threshold in terms of making something

materially different? Is it measured in nanograms?
Robert: The threshold is in terms of composition. We look at the composition of all the different components. This was something that I said last year and apparently I'm sure whether it made that impression or not. But over 75% of what we've seen in our evaluations are crops that generally people don't eat as whole food. So, we're talking here of the commodity crop of corn, soybean, canola and cotton. We don't eat cotton or canola. The only thing we get from then is the oil. There are no proteins in any of the oils. Oils are purified significantly, so that any proteins that might be available have been eliminated during processing. For soybean, the types of soybeans that have been modified generally are not those used to make tofu or beef be present in human food that the, again, the major things that we consume from soybean are soybean oil, some of the soybean flowers, but most soybeans are actually used for animal food. So, you're not really talking about products that most people would be consuming. For corn, again, we don't eat field corn as corn at all. A little bit of it would be in cornmeal. Most of it would be in ethanol these days actually. Some percentage would be in cornstarch, corn oil and corn syrup. And again, the cornstarch, corn syrup, and corn oil would have zero protein in it.
Teo: But cornmeal does have protein?
Robert: Cornmeal has some proteins but not a lot, and again,

often the way these things are designed, the new protein is not found to any significant extent in the grain you're talking about. Something that would be in terms of composition, you know, less than one part out of a million.

Teo: Okay.

Robert: So, consequently, something that is only one million per something would not be a material change.

Carolyn: And did you actually say what constitutes a material difference in terms of amount?

Robert: I don't think that we have a firm level there, but I mean certainly some of our standards are based on things that are set in the Food Chemicals Codex or in our Code of Federal Regulation. And unless something doesn't meet the criteria, it wouldn't be a material difference. So, for instance, with the modified oils, some of them are material differences because they don't meet the internationally recognized specifications for corn oil composition or soy oil composition, things like that.

Carolyn: Okay, thanks. John Bartholomew.

John: You said that the proteins are often not in the part of the plants that we eat.

Robert: That's correct.

John: And I understand that if you're talking about of the purified oils. But can you tell me more about that, I mean if you get something that's modified the DNA and you got already in

the cells, for example a plant that produces Bt or around the body of plant, aren't those traits in all the cells of the plant? Certainly, the genetic material.

Robert: No, they aren't necessarily. For instance, some of them only are in the chloroplast because of the way the proteins are targeted and so unless you're talking about--and that's particularly for the Roundup Ready thing. For Bt thing, which I would point out the safety of Bt is regulated by EPA and not FDA. Those maybe targeted differently, but again the amounts that are present there are relatively small.

John: When you say Bt is regulated by EPA, wouldn't it then fall under FDA once it's in a product that you actually eat that's being sold, is it then cross over and fall under you?

Robert: The Bt gene and the protein are regulated by EPA. EPA tests the tolerance for safe limits of these things and I would point out that Bt proteins can also be sprayed on organic produce. So, it's not like we don't eat those.

John: Well, the testimony we've gotten on that is that they degrade very quickly almost to the point of having limited usefulness. [INDISCERNIBLE]

Robert: Well, they also degrade when they're in the plant.

John: How do they do that? [INDISCERNIBLE]

Robert: The relevant point is that FDA looks at the safety of food in general. EPA is charged with the safety of pesticide. And consequently if there is a tolerance for a pesticide that's

set by EPA as being safe or an exemption from the tolerance, which is what you have for most of the genetically-engineered pesticides that the plants incorporated protectants. That those are set by EPA, but FDA does enforce to make sure that they're being followed. But in essence most of the things that are out there have been granted exemptions from the requirement for a tolerance by EPA.

John: What does FDA if there is an approved product and then someone does a study similar in the world that shows up in referral journal that shows that there're adverse effects to these products? Is there any kind of review at that point or reconsideration?

Robert: FDA does review the study to the best of its ability and determines whether it feels the study was well conducted and has validity.

John: So, the numerous we've been hearing about studies around the world that suggest there are organ changes, liver changes, allergy issues, tumor development. Those have been reviewed by FDA and determine to be flawed studies?

Robert: Particularly, the recent paper by Seralini et al was considered to be an extremely flawed study because it was taking animals at the end of their life where they are known to develop liver problems and tumors spontaneously.

John: Are these Sprague-Dawley rats?

Robert: Yes, and it bounds tumors and liver problems. I mean

that it would not result that anybody with any scientific credentials really thought it was a good study.

Carolyn: Teo.

Teo: To follow up on that, didn't Monsanto contract a study of the same variety of corn using the same type of rats and the same number of rats?

Robert: But not for as long.

Teo: So, the Monsanto study didn't go on as long?

Robert: The Monsanto study was only a three-month study. This was a two-year study, which is to the end of the rat's life. Rats only last two years. And the Seralini study had insufficient numbers of animals to come up with a statistically valid conclusion. Further, FDA doesn't really believe that this whole food studies in rodents really lead to anything because the rodent model was validated for doing studies of toxic chemicals. It was not designed for studying whole foods which are complex mixtures of proteins, carbohydrates, nucleic acids and fats. And consequently, there are a lot of differences in the way rodents process food than other animals do. For instance, rodents lack a gallbladder, so they don't handle fats very well. When you look at corn and corn actually has a fair amount of fat in it. So, we don't really consider this as validated models for food safety. And even in terms of other animals, the way other animals digest things is extremely different from the way rodents work. Moreover, even for

animals, most animal feed is processed before it's used. One exemption is the cow, but cows have four stomachs and rodents only have one. So, the rodents are not known for being a good model for whole food studies.

Teo: So, the Monsanto study?

Robert: We considered that flawed as well.

Teo: Okay, thank you.

Carolyn: Okay, John.

John: How then would you deal with the fact that if you have the human born since these products were developed, they could be eating this stuff for upwards of hundred years. What kind of long-term studies are being done to determine long-term effects of these products before they are put into the food chain?

Robert: Generally, you got to consider what people are actually eating and people are not lab animals. They are not eating these things at a 100% of their diet. People eat a diverse diet. As I said earlier, most of the things that people are eating from these things are highly processed and purified and contain no protein.

John: Well, the testimony we're hearing is that if you go to the grocery store and there're processed food, basically you can count that 80% of those products to be genetically engineered at least in part. So, truly, we're omnivores and we eat a variety of things but, you know, you're just buying off the grocery store shelves. You're eating a lot of it.

Robert: Lots of the stuff you're eating is stuff like cornstarch and the oils and corn syrup which contains no protein.

Carolyn: Go ahead.

John: A different direction here. We have one witness here who I have to say was extraordinarily uncomplimentary to FDA and basically said in no uncertain terms that genetically-engineered products are on the market illegally and that the FDA has not met its legal obligations to review these products and that evidently there was a lawsuit that was filed. I don't remember all the details, but do you know the case I'm talking about?

Robert: I'm aware of the case you're talking about. I know that case was thrown out of court.

Carolyn: It was thrown out of court, he says.

John: Yes. But certainly there were allegations that may or may not have been valid, can you comment? Do you know anything about the allegations? That's the kind of testimony we're getting from some people. Look, I'm giving you the opportunity to defend the FDA. [INDISCERNIBLE].

Robert: You know, people are allowed to express their opinions even if they're based on fictitious information.

John: If I remember correctly, the testimony was that the case was withdrawn for one reason or another. I don't just--I'm not an attorney, so I don't know the details, but that it wasn't actually thrown out but it was withdrawn.

Carolyn: But as part of that lawsuit, my understanding and I think we've had testimony to this effect, there was a discovery that revealed a number of internal memoranda that indicated that they were actually FDA scientists that were very concerned about the way the situation was being handled. And in fact that we were just sort of or the FDA was just accepting these products as, you know, generally regarded as safe.

Robert: I would say that most of that is based on thinking of some people from over 20 years ago. I would say that if you were to discuss it with current FDA staff, you would not get some of the uncertainty that those people expressed.

Carolyn: Is that because the other people have been let go?

Robert: No, it's because the other people in some cases have died.

Carolyn: Oh. So, thank you.

Robert: And one of the people who wrote one of those memos died of a heart attack at age 49.

Carolyn: Oh, not good. So, I just want to be clear as we have about seven minutes later, because we are going to be putting together our findings. So, I asked you this earlier, but I want to be very clear. So, the statement the FDA does not have statutory authority to requiring labeling of foods produced of genetic engineering. Did you say that that was true or there were conditions under which you did have the statutory authority to require labeling?

Robert: We could require labeling when there is a material difference.
Carolyn: Okay. So, if there is a material difference, you could require labeling.
Robert: Yes. And we also have said that there can be voluntary labeling.
Carolyn: Yes, right. And it doesn't seem like a lot of people are stepping up the plight to do that. And then the other piece of this is the statement that the FDA has adopted a policy regarding the labeling of food produced from genetic engineering based on a conclusion that these products are generally regarded as safe but no material difference from conventional products. Is that true?
Robert: That's not exactly true.
Carolyn. Okay. Can you clarify please?
Robert: General recognition of safety refers to things that are added to foods not to foods themselves. Foods themselves are presumed to be safe unless they're adulterated.
Carolyn: And so you consider genetically-engineered food not to be adulterated then?
Robert: We consider--well certainly it could be, but in most cases it isn't so. Let's say that somebody decided to put a human protein in genetically-engineered food. That would be probably not be something we would consider to be generally recognized as safe because we don't have a lot of experience in

eating human proteins. Or let's consider the instance in which somebody put a protein in from an animal source into a plant source. Since, we don't know how that animal protein would be modified perhaps by the plant, that's something we probably want to have submitted as a food additive.

Carolyn: Okay.

Robert: Does that help?

Carolyn: But generally speaking, you don't consider biotech products or genetically engineered products to be materially different from conventional products. In other words, GE corn--

Robert: If they turn out to be compositionally identical, we don't consider them materially different.

Carolyn: Okay, thank you. Interestingly, we heard of Teo Zagar, a member of our committee who has asked a couple of questions, spoke today about a spermicidal corn that was developed. Teo, could you say about a few words about that and I'd ask you to comment Dr. Merker.

Teo: This goes to another question, Dr. Merker. In the realm of biopharmaceuticals where it seem that there could be a market for foods that contain, you know, added vitamins or vaccines, I came across some information that a small company in San Diego had developed a spermicidal corn using a synthesized human hormone and it was going to go to field trial in 2004. Was FDA aware of that?

Robert: FDA probably is, my part of FDA isn't. Generally,

anything--so, our [INDISCERNIBLE] USDA APHIS, the Animal and Plant Health Inspection Service, are the people who are in charge of these files and for anything that is a food crop, they will not allow that to be planted, usually even in the same state that food crops are planted, that there's a pharmaceutical or industrial trade being produced by it. And the Center for Drug Evaluation or the Center for Biologics would have statutory authority over the products being produced by those crops. But, you know, our preference here from the food side is things that are being used for pharmaceutical purposes, we prefer they didn't use crops that are used for human food.

Teo: Okay. If there was a crop that was developed that could provide more vitamins, would that, you think, would require labeling or that would just be reflected--

Robert: That would require labeling. Generally, that's not being done so much in this country, but there are efforts to do it abroad. So, there is the infamous Gold Rice, that is certainly nutritionally enhanced and there are other efforts to do some nutritionally enhanced varieties in the third world. Again, you know, because people in this country tend to eat more diverse diets that, those things probably aren't just big an issue here.

Teo: Okay, thank you.

Robert: And most of the things they're talking about, we consume more than enough of.

Carolyn: The last thing I would ask and we have additional questions it's fine for folks to ask them, but there was a report that Dr. James Maryanski, who was an FDA Biotechnology Coordinator and he worked actually from 1985 until 2008 opined that the decision to regulate genetically engineered food in the manner that it has been was a political decision but not based on science.

Robert: I actually got an email from Dr. Maryanski on that one when I saw it in your bill. And he feels that the attribution was incorrect and was taken out of context. That certainly while there may have been--while the decision to do it, the way it was done was political, he feels that it does reflect the best [INDISCERNIBLE] at that time.

Carolyn: Is there someone we can get a hold him to have him say that to us?

Robert: Well, he is Japan.

Carolyn: Well, we have this thing called the internet.

Robert: Yeah. I will ask him if I can give you his email.

Carolyn: Okay. That would be great.

Robert: But he moved to Japan several years ago.

Carolyn: Anyone else have other questions? All right, Dr. Merker, we really appreciate your time today. And if we have additional questions, might we contact you?

Robert: I think that could be arranged.

Carolyn: Okay. Thank you very much. We really appreciate it.

Robert: Okay, thanks.

Carolyn: Bye-bye now.

Robert: Bye.

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can get something.
Carolyn Partridge: And then there is the word may, manufacturers may submit safety reports. So any other thoughts or questions about that section? Okay, F. There is a lack of consensus regarding the validity of the research or science surrounding genetically engineered food or both. The result is public uncertainty about the nutrition, health, safety, environmental impacts and the proliferation of genetic engineering technology that is not fully understood or proven to be safe. Kristina?
Kristina Michelsen: I might add there is a lack of consensus regarding the validity of the researcher science surrounding the safety of genetically engineered food because we don't want to get into the science of biotech because they seem to have a lot of research, what we are talking about is the safety.
Carolyn Partridge: Any other comments?
Male 1: Good catch.
Carolyn Partridge: I think that's a good idea because there hasn't been a long term feeding study, right?
Kristina Michelsen: Exactly, and that's the whole essence of what we have been hearing is that lack of consensus on the safety.
Carolyn Partridge: And the law school did present us with these folders which here is the one on health and I know that there is some--John wanted to bring something up that basically poopooed

the [INDISCERNIBLE 01:05:24] study on the grass and do you want to say a little bit about that and then the test with the controlled group?

John Bartholomew: Well, only that after the testimony I was disappointed in my lack of ability for the cross-examination and the two points I'd make is he readily discredited one study but then we even pressed him to discredit all the others that he heard about and the other piece is that he said that sprayed rats reached 2 years of old age have spontaneously developed tumors and I should realize that there would have been a controlled group. There is always a controlled group of animals that have not received whatever the test product is and the real test was is was there an incidence greater than the controlled group? That's the way any study would be conducted and he completely just assumed we wouldn't catch it and he was right.

Carolyn Partridge: Can you say [INDISCERNIBLE 01:06:29] rats?

John Bartholomew: Not much, other than--

Kristina Michelsen: They are lab animals.

John Bartholomew: I've seen a lot of sprayed labs in laboratories that are over two years old who don't have tumors and we are just dealing with basic white rat. They are just everywhere and he is right that the lifespan of a rat is somewhere two years but then they live quite a bit longer and when they are old enough and when they are in laboratory they are living in a very posh environment where they are cared for

every day and checked every day, given good food and water and they are safe from predators, so they can live a lot longer life like any other animal they will develop some spontaneous diseases as they get older but the main point is in any study, in any long term study involved in rodents, you can't run it much longer than two years because they don't live much longer than two years, and you will always have a controlled group and you will always have your experimental parameter in those groups compared to a controlled group, and this study, I didn't read the study but I looked at the abstract last night and they didn't have a controlled group and they talked about the incidents being higher than the controlled group in the abstract.

Carolyn Partridge: So did they have a controlled group or not?

John Bartholomew: Yeah it was the very first one.

Carolyn Partridge: And then there was another piece that some of us talked about, [INDISCERNIBLE 01:08:13].

John Bartholomew: We studied two years in rates and female [INDISCERNIBLE 01:08:20] groups died two to three times more than controlleds and more rapidly. That's in the abstract.

Carolyn Partridge: Okay, so there were controlleds.

John Bartholomew: Anyway, I can't believe I didn't.

Carolyn Partridge: The other interesting factoid--

John Bartholomew: Not that he would have had an answer.

Carolyn Partridge: The other interesting factoid about this

discrediting of that study was that there was a group of scientists who demanded that the medical journal retract the paper and so Kristina is going to look at some of it and do a research on who the scientists were but lo and behold, [INDISCERNBILE 01:09:07] who we heard from last week or the week before.

Kristina Michelsen: He works for the biotech companies.

Male 2: And the scientists were saying that the study was flawed but also that some people released all of this information. So, they are basically saying our conclusions are flawed but here is the information so the conclusion that it was flawed was based on clean information. And the other point is that, Merker also said the Monsanto study that [INDISCERNIBLE 01:09:33] was geared on was also flawed. (End recording)

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consumption go away.
Carolyn: And number 2, the VLS on the suggestion, which is a raw agricultural commodity or processed food that has been grown, raised or produced without [INDISCERNIBLE, 15:05]. Any comments on including that? On the next page, on Line 3, there's processed is [fit] for food again.
Male1: [Carolyn], can you explain that to me a little bit? I just want to make sure I understand what we're doing here.
Carolyn: Okay, so this is an exemption. A raw agricultural commodity or processed food that has been grown, raised or produced without the knowing and intentional use of food or seed produced genetic engineering.
Male1: What version are you.
Carolyn: Oh, well I'm looking at the VLS version.
Male1: Oh, so we're changing to the VLS now, right?
Carolyn: Their proposal was to put or processed food in there.
[Crosstalk]
Carolyn: So does legislative council want to explain that - what it has to do with the knowing use -- knowing intentional?
Male1: So what this is doing would be allowing some genetically engineered material to be in the food chain if the producer, the grower, wasn't aware that it was there. Is that what I'm.?
Female: I think it's sort of saying that it won't be a violation of this section if the label isn't put on when somebody didn't know their product had GMO.

Male1: Why wouldn't that go under the may -- potential if they don't know?
Female: If it had a label on it, they should say may, but if they don't know.
Will: This relates to our friend out in Oklahoma last year who thought that [INDISCERNIBLE, 17:26] GE contamination or again food.
Carolyn: Say that again, Will.
Will: I'll try. This goes back to the Oklahoma State professor who testified that there were advantageous amounts of genetic contamination in certified organic food, corn being one. So you've got a certified organic crop that has a genetic contamination. That's why we're reading this.
Male 1: Well it's kind of similar to the language you have in the organic standards, but if we're being truthful in our labeling and we're saying that we're not going to allow GMOs to be in our food system without labeling but then we're making this exception if somebody doesn't know.
Male 2: I think the exemption is actually there to protect the person that is down the food supply chain who is effectively relying on the assertation of their supplier. And their supplier, using the example that Will gave, may have thought that their food was free of a GE trait. But because of cross pollination and because of whatever occurrence that there was a GE trait, you don't necessarily want to penalize the producer

that's further down the supply chain because they are relying on the certification of their supplier, who did not know [they were] intentionally grow their crop or process their food with a genetically engineered component.

Male 3: Yeah, because the next sentence deals with the affidavit.

Male 2: The certification will deemed to be as described in the subdivision, so a raw agricultural commodity or VLS suggested processed food that has been grown or raised without knowing the intent of use of genetic engineering. If whoever sold that commodity or food to that person provides the sworn affidavit that the commodity or food has not been known or intentionally includes genetic engineering [INDISCERNIBLE, 20:17].

Male 4: So if I was buying produce from Will to make pot pies and labeling them non GMO and I found out after the fact that Will had sworn otherwise, was actually raising some GE crop and selling them to me, I would be protected from the direct retaliation because Will had lied to me?

Will: Or if I hadn't lied to you but I just [Cough] [INDISCERNIBLE, 20:49].

Male 4: You would spin it that way. [Laughter]

Will: Whatever it takes.

Carolyn: So [Herby], does that answer your question?

[Herby]: Yeah, it answers the question but [just want to make sure] we've got a lot of consistency in what we're doing.

Carolyn: We're making the rules here. John?
John: Label question -- it looks like a paragraph that was written by a [INDISCERNIBLE, 21:27]. On Line 10 where it says again not beknowingly, since we are at this point talking about whoever sold the stuff, is this a loophole to allow the person selling food to -- it says not knowingly -- just say, "I don't know" because you could easily do a swearing thing with the -- unless you know that you used genetically engineered stuff. "Well I didn't know, I didn't intentionally do it, so I'll give you a sworn statement." And all of the sudden you've got the suppliers with a new goal. Am I making sense? It's that not knowingly and that level of this that I'm questioning.
Male1: I don't know if that's a loophole as much as an enforcement issue that it would be intended for the -- our men enforcing it to determine if there were facts that the person did knowingly provide you with that food or didn't know he produced a commodity or the processed food with genetic engineering. Knowingly and intentionally is a fairly common -- or intentionally is a fairly common stand.
Female: And you're always going to find people who lie in any kind of court case. So I mean, you can't cover for somebody lying in a preceding.
Male 1: Well an example would be if you make chocolate chip cookies and I'm the supplier that sells you chocolate chips, and it's got corn syrup and I never checked, why couldn't I give you

a sworn statement that says that the chocolate chips have not been knowingly or intentionally produced? I didn't look. Isn't that intentionally?

[Crosstalk]

Male 2: Would you sell them as not containing GE?

Male 1: I've got a buyer who wants me to swear that I didn't intentionally or knowingly produce using GE products.

Male 3: And how are you going to verify that?

Male 1: I'm not. I don't know.

Female 1: If you don't verify it and you swear to it, then you're lying.

Male 1: I swore that I didn't know.

Female 1: You swear but you're lying.

Male 1: If you don't want to know the answer to a question, don't ask it.

Male2: If you're going to sell your food and it's not going to be labeled and you provide a certification attesting to the fact that it will not knowingly or intentionally produce and it actually was, then you're subject to enforcement for failing to label your product.

Male 1: Okay.

Male2: You're not branding your food and I think you'd be subject to misbranding under other provisions of the misbranding law for misleading your customer.

Male 1: Okay.

Male2: We get you one way or another.
Male 1: I'm just pointing it out. I just want to make sure there aren't any loopholes.
Carolyn: All right, so on Line 8, the VLS version inserts the word processed between [or] and food and to be consistent with the inclusion of the [INDISCERNIBLE, 25:06], do we want to include that here? So it would read the requirements of Subsection 4093A of this title with respect for raw agricultural commodity or processed food obtains from whomever sold the commodity or food that makes it, a sworn statement etc. etc.
[Crosstalk]
Carolyn: Okay, thanks. All right, moving down to 3, another exemption.
Female1: So 3 reads any processed food in which would be -- which would be subject to the Subsection 4093A of this title solely because it includes one or more processing aids or enzymes produced with genetic engineering. So this is the one reference to processing aid, which is a defined term.
Carolyn: We did have a question about processing aid. Do you remember what that -- we don't have to [listlessly] go over that, we can just finish this up and then go back to processing aids.
Female1: Well you were curious about -- you wanted some examples of each -- a substance that's added to food during the process but that's been removed in some manner. So there's

three different subsections example or types of processing aids.
Carolyn: Okay.
Male: Sure. Cheese making is a great example. Traditionally, a [rennet] was used as a processing aid and rennet is an animal by-product. Rennet has been replaced by some different processing aids. In addition, enzymes are also potentially used into cheese making and the enzymes that are currently being used are genetically engineered. But when you process the cheese, the rennet or the processing aid effectively transforms -- I can't remember if it's the process when you use the processing aid that replaces rennet or the enzyme. One of them effectively disappears.
Carolyn: And ones chymosin, right? Is that the rennet?
Male: I think so.
Carolyn: All right, does that answer people's questions about processing aids?
Male1: They are genetically engineered.
Carolyn: All right, any questions about 3? All right, 4. Four is about beverages.
Female2: Yes, a beverage that is subject to the provision of Title 7, which are alcoholic beveraging.
Female1: So the next page, 13, to fit the exemption is until July 1st, 2019, any processed food that would be subject to Subsection 4093A of this title solely because it includes one or more ingredients that have been produced with genetic

engineering, provided that A, it reads no single such ingredient, it counts for more than one half of 9% of the total weight of the processed food and B, the processed food does not contain more than ten such ingredients.

Female 2: I think the VLS had some comments about the similar to getting rid of the ingredients.

Carolyn: So what they say [a fine] is until July 1st, 2019, any processed food that would be subject to Subsection 4093A of this title solely because it includes one or more materials that have been produced with genetic engineering, provided that engineered materials in the aggregate do not account -- oh, account for more than 9/10 of 1% of the total weight of the processed food. So do we know why they changed that -- oh, is this the [INDISCERNIBLE, 30:15] language that was from the EU?

Female1: I believe so.

Male 1: I can speak to that. [INDISCERNIBLE, 30:21]. This was made to be in compliance with [INDISCERNIBLE, 30:28] and other places such as [Val Initiative] and [Washington] and [EU]. The original intent was that they would be total weight of these products but materials is not more than nine times the 1%. So you're correct.

Carolyn: Everybody okay with that?

Male 2: What is the change?

Male 1: The change -- proposed change was to eliminate the ‼ of .9, that was included here and then Section B, which was

including the bill last year that is not when their statement to make an exemption included that.

Male 2: And changing ingredients to materials?

Male 1: Yes.

Carolyn: Adopt that change? Everybody okay with that change?

Male1: What's the difference between 9/10 of 1% and 9/10%?

[Crosstalk]

Male2: This is one of those times though where I really think ingredient is the right word. Material just seems like you're trying to avoid saying ingredient.

Female1: Mike?

Mike: I think the FDA regulates ingredients and the kinetic engineering or the trait or component may be only a part of the ingredient. So I don't know I fit's always accurate or if it may be always accurate to say ingredient because I think you need to technically be more refined than just ingredient. And I think it also helps with any preemption argument if you are focusing on the GE component and not the ingredients.

Carolyn: With everybody okay with the VLS language?

Male1: Makes sense when he explained it.

[Laughter]

Female2: You could come up with a word rather than material.

Carolyn: It gives job security to Mike. [Crosstalk] Okay, 6.

Female2: Six, food that an independent organization has determined has not beknowingly and intentionally produced from

[INDISCERNIBLE, 33:35] with food or seed produced with genetic engineering, provided that the determination has been made pursuant to the sampling and testing procedure approved in regulations adopted by the department. No sampling procedure shall be approved by the department unless sampling is done according to a statistically valid sampling plan consistent with principles recommended by internationally recognized sources, such as the International Standards Organization or the Branch of Feed Trade Association. No testing procedure shall be approved by the department unless - do you want to stop there?

Carolyn: Yeah, a lot of that gets Xed out by the VLS version and I just wonder what your opinion is of that.

Male1: I think that's a policy decision.

Carolyn: Can you talk about what that policy decision is?

Male1: What the VLS recommendation does is reduce for the purposes of the exemption for third party certification. The third party certifier, as to someone that qualifies under the Federal Organic Food Products Act. That, and then any other third party certification effectively is eliminated.

Carolyn: So the Non GMO Project would be eliminated there?

Male1: I don't see - it says food at an independent organization - oh, that's an or. I'm sorry, I thought it was an at. It's an or. So you still have the third party [INDISCERNIBLE, 35:15]. I'm sorry, I thought it was an at.

Carolyn: That's okay. So you think the VLS language does what

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Female Participant 2: Page 112.
Representative Webb: And it's --
Female Participant 2: Thank you.
Representative Webb: -- Representative Webb.
Female Participant 2: Representative Webb, you're welcome to come up while we're all finding our -- if you don't mind us. 1.6 --
Female Participant 1: Yes, I asked Ray to call.
Senator Sears: Hopefully, you're planning a meeting in there.
Representative Webb: I actually am going to read everything.
***9:05:08 [OVERLAY]
Representative Webb: Is that okay? Okay. Page 1. It's all right here.
***9:05:15 [OVERLAY]
Representative Webb: Ready?
Female Participant 2: Welcome. Yes.
Representative Webb: Thank you. For the record, I'm Representative Kate Webb from Shelburne and I am the lead sponsor of H.12, an act relating to the labeling of food produced with genetic engineering. Before I begin, I just want to remind people about where we were with smoking. And here is a beautiful ad here, more doctors smoke Camels than any other cigarette and then we have Viceroy filters filter the smoke. As you're dentist, I recommend Viceroy.
So we've come a long way. And it took a long time for us to

just first recognize that there might be some problems with smoking, just maybe there might be. I don't know how many years that took, but I think it was probably 60 years for us to recognize that maybe there was a problem and that maybe we should do some labeling. And then we said cigarettes may be hazardous to your health. You can pass it. And then may be hazardous and then is hazardous and then not only that, causes cancer. And it took a long time for that to happen. And I just bring this up because I think that at some point labeling is going to be required. And it's a matter of which side of history are we going to be on.

This is an important bill. It's an extremely important bill. It addresses a right so basic as the right to know what it is that we're eating and how the food was produced and how it got to our plate. And it allows us to make informed choices based on our health needs, based on our religious requirements, based on our moral and ethical principles and our concerns for the environment.

For the last two years, the House Agricultural Committee has set a course to discover whether Vermont had the right to require labeling of foods produced with genetic engineering, what rights lie with the Feds and what lies with the state. And over the past two years they developed in the bill the findings. And the findings will represent their discovery on whether or not we have a right to know and to demonstrate the state's legitimate

interest in that knowledge.
In some areas there is compelling interest that shows that there are health risks. There are others that show that we have not looked at the long term studies. And when you look at why we don't have that, that's a really good question to ask. Why don't we have peer reviewed studies? Why don't we have independent studies?
We have been participating in the grand experiment, all of us. And this bill allows us to take ourselves out of that experiment and actually know. Now, there's nothing in here that says you can't buy cigarettes. We know you can buy cigarettes. There's nothing in here that says that you can't grow them. There's nothing in here that says you can't import them. It simply says just let us know. Just let us know.
So the Ag Committee passed a bill that they believe is legally defensible and I believe the bill is legally defensible, but it's before your committee to really look to make sure. That's my understanding why it's before you, at least, to see if it is legally defensible and if so what are the risks. And the Ag's Office will, I'm sure, speak to you about whether or not it's legally defensible and what are the risks.
And when we look at the risk, we also have to balance that with the risks of not labeling the risks to Vermonters. Although I'd love to read all of these binders to you as the representative from Newfane would like me to do, I'm just going to show you

some of the things here that we have, the testimony that they've taken to demonstrate the State's legitimate interest.

This is Volume 1 on the health risks of genetically engineered food. This is Volume 2. They've done their homework. This is a volume on economic costs and benefits of labeling genetically engineered foods. And I'm not calling it GMO, I'm calling it genetically engineered and I'm calling it that for a reason.

The FDA has jurisdiction over the labeling of ingredients. There's nothing in here that requires the labeling of ingredients. It has to do with how food is produced and there is, Leg. Counsel could take with you about that, but there is an opening for the State to be able to require labeling for how a food is produced, so we're not talking about the ingredients.

This one talks about religious concerns. Some genetically engineered products use shellfish and that is a problem for some religions.

And natural, have you ever bought something that says natural? It doesn't mean anything. It means nothing. You could pick up something that's completely genetically engineered and not get a glint of what that is. I think that Leg. Counsel will describe what genetic engineering is. But I'm quite sure that taking the DNA from some virus or bacteria and inserting it into the gene of something completely different is not a product of nature. So the word natural, go ahead and use it, it doesn't mean a thing.

This has to do with the Federal level of regulation where they looked at what are the rights that lie with the Federal Government and what lies with the state. And these are the environmental risks. This is what initially got me into this. Oh phew, I thought that was mine. This is what initially got me into this, but once you open this door and you find out the other risks, it's really pretty compelling.

And in fact, labeling of foods probably isn't going to have much to do with what the environmental risks because it's a little too indirect, but the health risks are a direct impact. So uh-oh, I won't do juggling to put that back. So you're looking at the risks and the question is, you know, does the state have that legitimate interest. I guess I want to encourage you that we are a state that's known for good health and good food. It's the Vermont brand and it's the Vermont way.

I really encourage you to be brave here. I encourage you to take that risk and I really think of this as a David and Goliath story. And I tell you, Goliath is big and Goliath has a lot of money, but it doesn't mean that they're right. And they're not going to be on the right side of history. And I actually was in Italy several years ago and I actually went and saw the David and I don't know if anybody's ever seen that, but it's an extremely moving experience to be in the fact of that sculpture. And what I remember so much about that sculpture is he's standing there, he's got the rock in his hand and his wrist is

just bent at just the right angle. And he's got his head turned and you can tell that he's looking off at Goliath and the look in his eye is I can take that Dude.

And I want you to take this on. I have to say one in closing. I've been interviewed around the country on various radio stations, people that are following what Vermont is doing. And I got a call from a John Statler ***9:10:29 [PH] of a public radio down in Texas. He calls me and says, Ms. Webb, I want you to know that I'm to the right of Rush Limbaugh, but on this topic you and I agree, so.

Male Participant 2: What was his name?

Representative Webb: John Statler. I'll give you his contact info.

Senator Sears: I think it was O'Reilly.

Male Participant 3: Yes, it was Bill O'Reilly. He'll tell you.

Female Participant 2: Thank you very much. And so we have other sponsors here. And before that, Representative Partridge did you want to say as to your bag or

Representative Partridge: Thank you, Madam Chair, and thank you, Committee, for taking this up. We really do appreciate it. I'm not going to say very much here. I would just encourage you to take a good look at this in terms of your purview here. House Agriculture and Forest Products has done an extensive job on this. Representative Conquest was on our committee last

year. He can tell you a little bit about the kind of testimony we have taken over the last two years. We took this back up this year and went through it again.

We have done really good work on this and I would just encourage you to take this up and potentially pass it out. I think it's important for Vermonters and for all of the state interests that Representative Webb mentioned. I will also give credit for these binders to the Vermont Law School, which made this a project and worked really hard on it. So thank you very much. Thanks for taking it up and we'll turn it over to some other folks.

Female Participant 2: Okay.

Representative Proctors: Thanks.

Female Participant 2: Thank you. Unless you have questions for me?

Representative Webb: I forgot to pass out something to you. This is Kate Webb again. The Vermont Law School did a study on whether or not this was the constitutionality.

Female Participant 2: Yes.

Representative Webb: And I'm going to give you and did you just want the semi here?

Male Participant 3: Sure, I'll just have oh, whatever, I don't care. Whatever you want to do, you go.

Representative Webb: I'm passing out the summary and the --

Male Participant 3: Oh --

Representative Webb: -- study.
Male Participant 3: -- here is the study.
Female Participant 2: Here, yes, that's a packet. I believe, I think, I'd like to check it. And after me, can you pass it down as well?
Female Participant 1: Did they actually testify on your Committee?
Female Participant 2: Yes.
Representative Webb: I've got the list.
Female Participant 2: Okay.
Representative Webb: I'll get you the list of everybody that testified. One of us will.
***9:08:20 [OVERLAY]
Female Participant 2: Two separate documents? Yes, they are.
Representative Webb: One's a summary and one's the whole thing.
Senator Sears: I just gave one to Bill.
Representative Webb: One's the Cliff notes.
Male Participant 3: Oh, I was just putting that package there for Bill.
Representative Partridge: That's two documents.
Male Participant 3: The one you just picked up.
Female Participant 2: Okay. I'm sorry, so.
Male Participant 3: It's a double.
Representative Webb: You can test them. Just

Male Participant 3: And I need one more now.
Representative Webb: One more.
Senator Sears: Do you have one for Bill?
Male Participant 3: Yes.
Female Participant 2: Yes, okay.
Senator Sears: And Kate?
Female Participant 2: All right. Okay.
Senator Sears: Kate's got one? Everybody's got one.
Male Participant 2: Yes. Do you have extras?
Representative Webb: I can't give an extra.
Female Participant 2: And I do need a mindful note that we only have Michael O'Grady, Leg. Counsel until when?
Female Participant 1: And that's when?
Female Participant 2: 10:30, we're going to be at the Attorney General's Offices coming over. And they're only available until about 6:00.
Representative Zagar: I'll try to talk fast.
Female Participant 2: Okay.
Representative Zagar: Thank you, Committee. Thank you, Madam Chair, for having me. I'm going to pass out a one sheet. These are some quotes that -- oh, for the record I'm Teo Zagar from House Ag. I'm one of the sponsors of H.112. These are some quotes that just illustrate some of the circle of non-accountability and the safety and regulation of genetically engineered food.

As you heard, the FDA does not test genetically engineered food. They rely on data paid for and provided by the biotech industry, but don't dictate how the products are tested or what they're tested for. There is virtually no independent safety testing in the U.S. because of intellectual property right restrictions. Companies hold patents on the genes that they insert into the crops which limits their use by farmers and researchers.

So the products are distinct enough to warrant patent protection, but are not materially different. We were told that the FDA can only treat food as being different if it is organoleptically different meaning that the difference is evident to one of the five senses. So if you can't see, hear, smell, taste or feel the altered gene, then it's "substantially equivalent" to the original gene except that it can be patented and sold.

Genetic engineering is not conventional breeding as some might have you believe because it often involves the insertion of genes from outside of the species in a way that couldn't happen naturally. What conventional breeding shuffles around chromosomes, the imprecise nature of some of these techniques can lead to the creation of novel amino acids and DNA basis which can cause unintended effects if non-targeted genes are either activated or deactivated.

There have been numerous international animal studies published

in peer review journals, they're in one of the binders that Representative Webb brought, that have showed allergic reactions, compromised immune function, kidney and liver damage, gastrointestinal damage including leaky gut, reproductive system damage and lower birth rates. These studies are dismissed out of hand by the industry because they're seen as either being flawed or non-replicable.

When I asked one of the biotech folks last year about whether or not the patent restrictions could maybe impede some of these results from being replicated, it was admitted that that might be the case. So labeling genetically engineered food could allow for the tracking of potential health problems in humans and serve as a risk management measure to deal with scientific uncertainty.

I just want to mention one particular study. It's the Seralini study of 2012. It was conducted by a team of researchers in France. It was one of the only long term feeding studies of rats using GMO corn. It showed a higher incidence of tumors, organ damage and premature death in the rats fed this corn. The study was immediately attacked by proponents of GE technology. They said it was flawed because they used the wrong rats, they were predisposed to developing tumors anyway and they didn't use enough rats.

Dr. Michael Hansen, senior scientist at Consumer Reports, told us that the Seralini study was actually intended to mirror a

similar study that Monsanto had used and provided to FDA. So they were just looking to replicate that to see if they got different results. When we spoke to Dr. Robert Merck at the FDA, he also dismissed the Seralini study. But when asked about the Monsanto study that the Seralini study was intended to mirror, his reply was we think that study was flawed too. So I wonder how influential that study was in this approval process. And this is a good example of the scientific uncertainty on this issue.

So to wrap up, I would just say that our Committee did not set out to nor did we unearth incontrovertible proof that GE food is dangerous, but we did come to the conclusion that there is enough uncertainty about the health and environmental consequences to grant Vermonters that right to make educated decisions when buying food. Thank you.

Female Participant 2: Thank you.

Female Participant 1: Thank you.

Male Participant 2: Yes, Teo.

Female Participant 2: Teo.

Female Participant: Teo.

Male Participant 2: All right. Go ahead.

Representative Zagar: Oh, sorry. Are you guys done?

Senator Sears: I really want very much to do this. I believe in paying for a choice. I have two questions that I'm going to be asking throughout this, one is how practical is it and what

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Robbins, Russell, Englert, Orseck, Untereiner & Sauber LLP

[00:57:16 Overlay]
Karen Moore: Good morning, Karen Moore.
William Lippert: Good morning, uh, Ms. Moore, this is, uh, Representative Bill Lippert, I chair the House Judiciary Committee.
Karen Moore: Good morning, Sir, how are you?
William Lippert: I'm good. Uh, appreciate your being available to, uh, testify for us today. Uh, my understanding is that, uh, you're prepared to offer some comments and perspective on the bill which is colloquially referred to as the GMO bill here. Um, and what would be helpful is if, uh, if I'm correct that you're available to do that with us right now.
Uh, I would appreciate it if you would -- could start by, uh, just identifying yourself, 'cause there is a recorded record. And then perhaps give us some of your background, and then, uh, share with us what your thoughts are about the bill. I assume you've had it in front of you and had the opportunity to review it?
Karen Moore: Absolutely, Sir. Um --
William Lippert: And lemme -- I'll -- let me --
[00:58:33 Overlay]
Karen Moore: That I would need to testify today in opposition in House Bill 112. My name is Karen Moore, and I am the General Counsel of the Grocery Manufacturers Association, or GM -- GMA. Uh, prior to both, I was a General Counsel with the Designer

[00:58:50 Indiscernible] Wholesalers of America. Before that I was with a large law firm for a number of years, and before that, with the federal government, um, for about 15 years, specifically with the Federal Trade Commission.

Um, as you may or may not know, the GMA is the voice of more than 300 leading food, beverage and container product companies that sustain and enhance the quality of life for hundreds of millions of people in the United States and around the world. We're based in Washington, D.C., and our members include internationally recognized brands, as well as [00:59:19 Indiscernible] localized brands.

I'm here speaking on behalf of GMA and other individual miners and, um, the [00:59:27 Indiscernible] asked to speak on legal issues, uh, involving H.R. 112.

William Lippert: Yes.

Karen Moore: Um, most of this you may know, but by way of background, California's Prop 37 stirred a nationwide interest in the idea of labeling foods that contain ingredients derived from genetic engineering. Although Prop 37 was defeated by popular vote, a number of states are now considering measures equivalent and indeed virtually identical to Prop 37 [00:59:56 Indiscernible]. Um, I feel Vermont should take heed.

A mandatory labeling regime for food containing ingredients derived from genetic engineering raises serial con -- serious Constitutional concerns. [00:60:09 Indiscernible] stems from a

fundamental defect in these legislative efforts. The absence of a legitimate and Constitutionally sound state interest in requiring the label of foods.

The FDA began approving, uh, genetically engineered plant varieties in 1994. Now, 70 to 80 percent of packaged foods in the supermarkets contain at least one ingredient that was produced with genetic engineering. The most common ingredients derived are corn, soybeans and canola. About 90 percent of domestic production of each of these crops are varieties that have been genetically engineered.

Despite these rumors, the FDA has never found it necessary or advisable to require labeling of a food produced with ingredients derived from genetic engineering, and indeed, it says that such labeling would be misleading, and therefore impermissible. The FDA monitors the safety of food products we know. In other words, the fruits, vegetables and grains that make it to the dinner plate in one form or another.

Genetic engineering is a form of production. It is like hybridization, irrigation, other forms of genetic manipulation that are common in modern agriculture. Quite rightly, FDA's view is that production methods are irrelevant if the food that results is safe. The FDA has found that foods with ingredients derived from genetic engineering are just as safe as foods with ingredients produced by other methods.

Study after study has found that this does not present a unique

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Steve Carr: Teo's not.
Kristina Michelsen: Teo's not.
Carolyn Partridge: Oh, sorry. You're not. You're a freshman and a half. Right. Sorry, Teo. Yeah, anyway, I'm going to turn this over to Teo and he will start. Uh, he's kind of our lead guy and we also have Kristina Michelsen and Tristan Toleno working on it as well. So we wanted to, we wanted to inform you of what we had done.
Teo Zagar: We appreciate that. Thank you for the upgrade and title too.
Carolyn Partridge: Well, you're kind of chair for the moment, acting chair.
Teo Zagar: All right. So I'm Teo Zagar, for the record, from House Ag. Uh, I'm going to be reporting Section 1 of this bill, which is an extensive collection of findings. Uh, we received, uh, a very in-depth education on this subject and these findings are pretty essential in establishing the State's legitimate interest in enacting this legislation. Um, I'll go through this kind of briefly because it is complicated and there's a lot here.
But, uh, I'll go over the essentials. Under current U.S. law, GE foods are not regulated for safety and are not required to be labeled. Uh, they're increasingly available for human consumption up to 80, I would say approximately between 80 to 90 percent of all processed food contains GE, uh, material, 93

percent of soybeans, 88 percent of corn, uh, high percentages of sugar beets and canola. Um, there's no formal FDA policy on the labeling of GE foods.

There's only non-binding guidance. And there is voluntary safety consultations that are done. Uh, the FDA receives and accepts data provided by the industry that they compiled, um, from tests and studies that they fund and pay for. Um, there is a lack of scientific consensus about the validity in science of the safety of GE foods since they were essentially deregulated from the very beginning when they came on the market in 1992. Uh, there have been no long term studies, human health studies.

Independent scientists in this country are limited in their ability to do research because of patent laws. The companies hold the patents and have to approve testing. Um, but internationally there are study after study that show evidence of harm in animal feeding studies that indicate that GE fodes, GE food could potentially pose risks to health, safety, agriculture and the environment. And I-I'm going to go over a lot of these studies tomorrow on the floor. Um, but your committee felt that there was ample evidence to show that there's a potential risk involved in these, in these products.

Paul Ralston: Okay. Can I just ask a question, Teo?

Teo Zagar: Yeah.

Paul Ralston: Can you go back to the stats on processed foods?

Teo Zagar: Okay. Up to 80 percent of processed food sold in the U.S. is at least partially produced from genetic engineering.

Paul Ralston: And I'm just curious about the up to --

Teo Zagar: Up to.

Paul Ralston: -- because that's a big number.

Teo Zagar: Yeah. It is a big number. This is, this was a consistent number, um, that we found in, in many different reports and statistical analyses.

Paul Ralston: So in the grocery store it may be 80 percent of the food in there.

Teo Zagar: Yeah.

Tristan Toleno: Of processed foods.

Teo Zagar: Processed food.

Paul Ralston: [00:50:18 Indiscernible].

Teo Zagar: Yeah. Yeah.

[00:50:19 Overlay]

Teo Zagar: Yeah, some of them are.

Paul Ralston: Why don't we just say all food [00:50:27 Indiscernible]?

Teo Zagar: Unless it's labeled as organic or non-GMO.

Paul Ralston: Okay.

Kristina Michelsen: [00:50:33 Indiscernible].

Paul Ralston: Right. No. I know they're not.

Kristina Michelsen: Most fresh vegetables are not GE.

Paul Ralston: Now that I know.
Kristina Michelsen: Cucumbers or some cucumbers mixed with squash. Maybe it's just squash.
Paul Ralston: Tomatoes.
Kristina Michelsen: No.
Paul Ralston: No tomatoes?
Carolyn Partridge: I think they took they -- did they take the Super Saver Tomato off the market?
Kristina Michelsen: Flavor Saver.
Teo Zagar: Yeah.
Kristina Michelsen: [00:50:53 Indiscernible] tomato.
Carolyn Partridge: Save the flavor for another time.
Paul Ralston: Yes.
Steve Carr: Excuse me. Just so I'm clear on this. We're talking not just where there would have been some modification to --
Chair Botzow: Wait. Wait. Can we have one conversation going on at a time, please? Thank you.
Steve Carr: We talking now about, well, it could be something that improves the quality of the product itself, whether it's size, color or something like that. But it also is insect resistance, uh, disease resistance. Those things done genetically are all part of what we're talking about. Correct?
Carolyn Partridge: Yes.
Steve Carr: Okay. I just wanted to make sure. So we're aren't

limited just to necessarily something we made. The physical piece of food or passed visually attractive or, or something like that other than the fact that it's mostly [00:51:40 Indiscernible].

Female Participant 1: Round Up Ready.

Steve Carr: Yeah, right.

Teo Zagar: The two most commonly, the two most common, uh, GE products are, are, um, are engineered to produce their own pesticide, uh, or they're engineered to be, uh, herbicide resistant. And there's a lot of evidence that the bugs and the weeds are becoming resistant. So we're having to re-engineer and introduce stronger and more pesticides and herbicides, herbicides.

Paul Ralston: Are GE seeds based more commercial? Say your garden variety of, of seeds that we would plant as, you know, home gardeners. Are they GE seeds that we can get?

Teo Zagar: I believe so and --

William Stevens: There is some sweet corn. But not generally here.

Paul Ralston: Can you identify yourself for the record?

William Stevens: I'm sorry, yeah, Will Stevens.

Paul Ralston: [00:52:31 Indiscernible]

William Stevens: Yeah. Sorry. I should have known.

Teo Zagar: Should I go on?

Paul Ralston: I wanted to catch that otherwise I wouldn't know.

William Stevens: Yeah. Just ask.
Teo Zagar: So sort of the, the spirit of the bill is, is, uh, represented in the findings that for multiple health, personal, cultural, religious, environmental and economic reasons, the State finds that GE foods should be labeled. Uh, public opinion polls indicate -- conducted by the, uh, University of Vermont have consistently shown numbers of approximately 95 percent of Vermonters, um, demanding GE labeling and I think this is consistent across the country too.
Beginning in around 2001, the UVM poll, started in 2001 and the numbers have been fairly consistent up to, I think, 96 percent. Uh, the -- one of the important things to, to note about genetic engineering is that it is a process that can not happen naturally. So it's not traditional hybridization. Uh, it involves -- it can involve, uh, inserting cells from one species to another in ways that would never happen naturally, inserting viral or bacterial genes.
Um, another part of this bill is that it would -- so we require the labeling of foods produced using genetic engineering but also prohibit using any derivation of the word natural if it's processed using genetic engineering because that could be misleading and deceptive to consumers.
Um, so the purpose is to -- is because the FDA and Congress do not require GE foods to be labeled that the State of Vermont should require labeling in order to serve the interest of the

State in preventing consumer deception, preventing potential risks to human health, probably the biggest one, promoting food safety, protecting cultural and religious practices, protecting the environment, promoting economic development. And now we get into the labeling itself, which, uh, one of my committee mates will be reporting. Do one of you guys want to take that?

Kristina Michelsen: Sure.

Teo Zagar: Section, yeah. I don't know how deep we want to get into these.

Woman Participant 1: Do you want to switch seats so that -- because the tape is on that microphone?

Chair Botzow: Yes.

Tristan Toleno: So, Tristan Toleno, House Agriculture and Forest Products. Uh, subsection 3043, which is the labeling section of the act is, um, the part that details the requirements and the process for labeling foods. And it sort of establishes the scope of, uh, where the application is required. Um, so primarily this, uh, is addressed at, at foods that are offered for retail sale in Vermont and have been entirely or partially produced with genetic engineering.

Uh, there is some detail, uh, in the subparts of Numbers 1 and 2 that describe exactly the wording that should be used on the label and, um, I don't need to burden you with that right now. There's a subpart C that clarifies, uh, the concern about misleading of consumers through the use of the words natural,

naturally made, naturally grown, all natural or similar import, uh, that could on labels for products that do meet the requirement of, uh, being labeled as being entirely or partially produced with genetic engineering.

And then the subpart D, um, makes clear that the labeling requirement is, uh, for the retail packaging and is not for any individual ingredient. We do not interfere with the ingredient list at all, um, and that's because of Federal preemption that's already currently regulated. So I'm not sure if there was anything else in that section that --

Paul Ralston: [00:56:39 Indiscernible] context of the exemptions?

Tristan Toleno: I-I can take you through the exemptions now. So, um, so there's a -- well, I'll do the, the quick overview of the exemptions and then let Kristina talk and then if there's questions about the exemptions. Uh, exemptions 4, 7 and 9 are there because of Federal preemption. Exemption 1, uh, exempts food consisting entirely of or derived entirely from an animal which has not itself been produced with genetic engineering, so meat, milk, that sort of thing.

Exemption 2, um, I'll read. This is a little confusing but perhaps easier the bill language itself. It's for unintentional and unknowing use, which applies only in situations where the person otherwise responsible for complying with the labeling requirements receives a sworn statement from his or her own

supplier affirming that the commodity or food has not been knowingly or intentionally produced with genetic engineering as has been segregated from and not comingled with a product that should have been -- that would have required a labeling requirement.

Uh, exemption 3 has to do with processing aids or enzymes. Exemption 5, uh, is a time limited exemption, which recognizes the fact that because of the pervasive use of genetically engineered foods, um, that there needs to be some time to allow people to, uh, deal with very small amounts of genetically engineered materials, uh, as they work towards, uh, fully complying. And that has a five year time limit.

Exemption 6 is the process for the, uh, Office of the Attorney General to, uh, use certified independent organizations, uh, for independent verification of foods that would be exempt from labeling. And Exemption 8 is for the food service, uh, industry, uh, that primarily deals with processed foods prepared for immediate human consumption.

Um, they are not packaged for retail sale and, uh, it's an impractical, uh, sector of the food, um, system that for labeling because it's hard to label, uh, when it's prepared for immediate human consumption, changing menus, that sort of thing. So those are the exemptions, a quick run through on those.

Male Participant 4: What about food that's consumed in restaurants?

Tristan Toleno: That's what it -- that's all -- that's what the last exemption is. It's because there's no -- unlike in a retail environment, there's no clear and easy way to label. Menus change all the time. Um, you know, there's a lot of change within the food establishment, food service establishments, uh, with foods that are prepared for immediate consumption.

So it's unlike in retail environments where you have, uh, labels that are going to go through a rigorous and long term process to get on the packaging and there's an expected time on the shelf where that investment in, in labeling can actually sit in front of the consumer.

Vice Chair Marcotte: I'm just curious about -- um, I mean, I can understand the exemptions of dairy but we've never got this [00:59:52 Indiscernible] --

Tristan Toleno: Uh-huh.

Vice Chair Marcotte: -- if we did and it said dairy. Is that in general?

Tristan Toleno: I mean the reason for the dairy and the meat exemption is that there's a distinction between a product, say corn, that has itself been genetically engineered that becomes a, uh, component of a food and a, a meat or a product from a, a meat animal that is not itself genetically engineered. That's the distinction point.

Paul Ralston: But don't consumers want to know that their

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(00:00:16) [OVERLAY]
Chairman Starr: Dave, you know everyone?
David Rogers: I do.
Chairman Starr: Yep, and --
Chairman Starr: Good to see you again.
David Rogers: All --
Chairman Starr: Chris -- Senator Bray isn't here yet.
David Rogers: Right.
Chairman Starr: He should be right along. And -- so we're working on 112, taking --
David Rogers: Right.
Chairman Starr: Testimony and hearing witnesses, and it was recommended that we invite you in, and I --
David Rogers: Well, thanks.
Chairman Starr: Glad you could --
David Rogers: I appreciate it.
Chairman Starr: Make it.
Dave Rogers: Thank you. It's good to be with you again in this intimate setting.
Male Participant: To say the least.
Dave Rogers: So I'm Dave Rogers, I'm a Policy Advisor with the Northeast Organic Farming Association. I think you all know about NOFA and all of the many programs we have. Appreciate the opportunity to come in and talk with you about this. Just a little background, I mean, myself, I've been with NOFA for eight

years, and before that, I retired from the UVM College of Agriculture faculty after 28 years there.

And while I was there, participated in research -- livestock disease research, dairy cattle research, microbiology research. I taught courses in anatomy and physiology, animal behavior. I also developed Graduate courses in Agricultural Policy and Agricultural Ethics. And before that, I was -- grew up on my family's poultry farm. I like to joke we had 10,000 chickens, two milk cows, a few hogs, and seven kids. Try to raise seven kids on 10,000 chickens these days.

So I'm going to address question of science, and health, and uncertainty, and how that justifies labeling. There's lots of aspects to this. I was at UVM at the creation in 1973 when the first science that enabled all of this to happen was put in place, and followed its development and taught about the development of it all through the 80s and 90s. So I've been paying attention.

Male Participant: (00:02:39) [INDISCERNABLE]. There's more.

David Rogers: You probably all have a sense of what the history of that development is. You know, the first field trials took place in 1986 with a herbicide-resistant tobacco plant -- spray it with herbicide and it won't die. 1992 it was approved by the FDA, considered -- generally recognized as safe and substantially equivalent to conventionally bred plants.

I have to say, and I think maybe the committee knows this, that

unbeknownst to everyone at that time and only revealed in recent years, the scientists at FDA were really expressing strong doubts about whether these products should be approved without strong, pre-market mandatory testing.

Male Participant: Is there documentation of that fact?

David Rogers: Yeah, I'll give you a Web link, you can see the scanned memos. Basically, the FDA scientists said, "Look," you know, "you guys are going to be approving this, but we think," we, that is the technical scientific experts at the agency, "we think these risks are quite different from conventional breeding, and we really need to do a much better job of taking a look at that." But all -- they were overruled, 1992.

1996, the first commercially crop -- first commercially genetically engineered crops -- corn, soybean -- were put on the market. They were resistant to herbicides -- or tolerant to herbicides, and resistant to insects. So another piece of genetic engineering was to put a gene in there that would produce a protein that was a toxin so that the plants became toxic to the insects, and they would die.

In fact, the EPA -- these plants that have the insect toxin in them, these plants are actually registered as pesticides with EPA.

Chairman Starr: So are they -- have they done good, bad or indifferent?

David Rogers: Well let me talk about the health-related

aspects, but -- I'll get to that. That's the central focus of my talk here. And I'm going to try to move this quickly, I know you have many questions, of course, stop me whenever you want. I know you do.

Chairman Starr: Yeah.

David Rogers: So today, you know, we're less than 20 years later and we've got something, you know, several hundred million acres of these crops -- dramatic increase, somewhere between 80 and 90 percent of the corn, soy, canola, cotton, sugar beets, papaya, are genetically engineered. They either have herbicide tolerant and/or insect resistant qualities.

In the pipeline, we've got a couple more dozen varieties of corn resistant to -- and soybeans, resistant to other herbicides. Apples, sugar cane, cantaloupe, wheat -- these are all trials or pending approval. Eggplant, cabbage, salmon, on down the line.

Chairman Starr: What are they doing with the apples?

David Rogers: They've put a gene in there that will prevent or reduce the browning of apples after you cut them. So, you know, you cut an apple, it starts to brown right away. It's kind of a neat trick to be able to say, okay, well you can cut these and they won't brown. The genetic engineering, I think, breaks down an enzyme that results in browning, so -- yeah.

A couple years ago, Monsanto came out with a genetically engineered sweet corn that has -- is herbicide resistant -- or tolerant, and has two toxins in it. And their plans at the time

was to release this in the Northeast, and basically capture a good fraction of the market rather shortly. So these are out there, I think, planted sweet corn.

So -- and about 75 percent of our processed foods on supermarket shelves contain ingredients made with either genetically engineered corn, soybeans, canola. So that's the status of things, and incredibly, you know, incredible expansion. We're talking 18 years since the first commercially available crops, and now basically, 90 percent. It's a revolution, I think everyone would agree with that.

Chairman Starr: If you grow granola, and you --

David Rogers: Canola?

Chairman Starr: Yeah, and you take the oil out --

David Rogers: Right.

Chairman Starr: And you cook something in the oil --

David Rogers: Right.

Chairman Starr: Is that considered a product of a --

David Rogers: Well, it is, I mean --

Chairman Starr: The product that you cook?

David Rogers: It would be -- well, you know, to the degree that you're ingesting the oil, that would be a concern. But lots of people use canola in salad dressings and things like this.

Chairman Starr: Because yesterday, we had a cracker --

Male Participant: You're talking about Westminster Crackers.

Male Participant: Westminster Crackers.

David Rogers: Right.
Chairman Starr: Yeah, and --
David Rogers: They use canola oil.
Chairman Starr: Yeah, so that gets into the crackers?
David Rogers: You know, the concern there with the oils is that -- and you know, we can't get into this, that would be a long session. We could have another session on this, but the process of genetic engineering results in cellular changes that result in things being produced that -- changes -- things being produced that could be included in the oil that were not there before. So that's the concern with -- it's not so much with this DNA -- what protein in the oil.
It's that there are other metabolites that could be included in the oil. We really don't understand how -- and this is the point of what I'm saying here -- we really don't understand how this process affects the function of the cell in lots of different ways. And this is --
Chairman Starr: Is that on --
David Rogers: What the FDA scientists were saying in '92.
Chairman Starr: What I'm concerned about with that -- why I asked the question is, you know, we don't want to chase businesses out of here --
David Rogers: No, course not.
Chairman Starr: That use that, and yesterday, we had someone testifying that, well, that's what they use is --

David Rogers: Well, you know, yeah. I mean, I understand that. I think the effect on sales and marketing of putting a label on -- we don't know that. I think lots of -- we put labels on cigarettes and people are still sucking them down. So I don't know what the market effect will be --

Chairman Starr: Yeah.

David Rogers: But for those companies who wish to switch over and use non-GMO canola oil, sources of non-GMO ingredients are growing rapidly and are readily available, and in fact, here's a whole catalog of global -- of suppliers that --

Chairman Starr: Of non --

David Rogers: Non-GMO. So if you want canola oil --

Chairman Starr: So there is a product?

David Rogers: You can go in -- and we had testimony last year in the House Ag Committee from the folks at the Vermont Oil Producers Association -- Oil Seed Producers Association, that said hey, people want non-canola, non-GMO canola, we'll grow it, that'll be a great new market for us. There's an upside to -- in terms of effects, as well.

Chairman Starr: What about corn that's run through and put in, you know, the oils come out and make gasoline?

David Rogers: Biofuels? Yeah, that's genetically engineered corn. Lots of concerns about that.

Chairman Starr: What about the exhaust out of the cars? They have to change --

David Rogers: I think probably with exhaust we've got more to worry about than a few -- than that. Yeah. That's -- never thought of that. But --

Male Participant: Have you gotten through your various testimony --

David Rogers: No, I haven't. I need to move, sorry. It's always fun to -- so 20 years on, and those questions those FDA scientists were asking have not been answered. So I want to just do a brief case with Bt and corn to illustrate this, and this is based on some recent science. So insect-resistant corn has this gene that produce -- that is taken from a soil bacterium, Bacillus thuringiensis, and it produces its own toxin.

So they've taken the gene out of that organism and put it into the plant, and so now the plant, in every cell of the plant, produces this toxin. So if an insect comes along and bites the plant, it dies. The plant is toxic to the insect. So we're talking about Lepidopterans here, moths, butterflies, cabbage worms, things like this.

And Bt's been around for 50 years, organic farmers use it, they spray it when they have an infestation, when needed. Washes off, breaks down in the sunlight after a few days. About 90 percent of the corn has -- is Bt corn, so -- and about 75 percent of the products on the shelves have this. So, you know,

people are getting regular doses of this.
And -- but yet in field and laboratory studies, Bt toxins have been shown to be allergenic, and the FDA sort of ignored evidence to that effect at the time they approved it. And I'm going to leave you with a paper that is an excellent paper, you want to get into the weeds on this. There's a whole case study on Bt, what the science was at the time in '92, how the FDA dealt with it. I'll leave it here, it's on Page 8.
That's written by a couple of respected scientists, one of them is the Professor in Head of the Laboratory of Cellular Neurobiology at the Salk Institute. So, you know, we're not talking about people who get their degrees from, you know, mail order catalogs.
Male Participant: Online universities?
David Rogers: Yeah. Not to disparage them. So in 2011, in the Journal of Reproductive Toxicology, that's this article, Quebec scientists found that Bt toxins were circulating in the blood of pregnant women and the fetal cord blood, as well. This is the first time we've seen this, it raised all sorts of questions, and they concluded that paper by saying, "Given the potential toxicity of these environmental pollutions and the fragility of the fetus, more studies are needed."
That's how they concluded. They said, what's this doing here? We don't know. Last May in the Journal of Hematology and Thromboembolic Disease -- I had to practice that -- another

study Brazilian scientists published a study that found that Bt toxin was toxic to bone marrow and blood in laboratory mice. And they concluded by saying, "Taking into account the increased risk of human and animal exposures to significant levels of these toxins, especially through diet, further studies are needed before concluding that Bt toxins are safe for mammals." And it's just the tip of the Bt story. There's lots of other science, lots of new science, that indicates that there can be problems with Bt.

Chairman Starr: When did that start? When did they start using Bt?

David Rogers: Back at the very beginning. I believe those first commercial crops had Bt in them, and certainly they were herbicide used on top of it.

Male Participant: It says '96-ish.

David Rogers: '96-ish. And it's the same story with herbicide-tolerant crops. This incredible amount of -- a growing body of international literature that shows that there are questions that were raised and have been raised for years that are just now starting to get addressed, and the questions to which we are not close to having the answers. So, I mean, a good review of the literature was done in 2011. This was by a Spanish researcher who has published literature reviews looking at all the science related to health. He first started in 2000, the year 2000, when something like 50 percent

of our acres were GE. There were only eight studies that had anything to do with health in the literature. Now we have, you know, 90 percent, and he's done another one in 2007. In 2007, he looked at all the literature and he said, where are all the studies showing these things are safe?

2011, some studies did come along, a number of studies, showing that there -- that these things were safe, and he takes note that all of them were conducted by the industry or funded by the industry. I don't want to say that's bad science, I just want to say that it sort of raises a flag. So, anyway, 2012, the Council on Science and Public Health with the American Medical Association looked at all the science.

And basically, after reviewing it, they said, they called for mandatory FDA pre-market assessments as a "preventative measure to ensure the health of the public." Most people don't realize that the FDA doesn't require mandatory testing. It's all voluntary. The companies will submit the data to the FDA, the FDA says, okay, you think it's good, that's good enough for us. If you want to learn all chapter and verse about that, look in the Schubert and Freese paper that I handed out on the safety and regulation in these things.

2004, National Academy of Sciences, National Research Council, Institute of Medicine, published an extensive review of safety of genetically engineered -- genetically modified crops. And they basically said that all breeding, traditional and

otherwise, can introduce changes that we should probably be paying attention to.

We never really have paid proper attention to these changes, but genetically engineered -- process of genetic engineering produces an elevated risk -- an elevated likelihood of unexpected and unintended consequences. And they say, "A significant research effort to develop new methods and dietary survey tools to detect health changes in the population that could result from genetic modification, specifically genetic engineering of food, are needed."

And these methods have not been adopted, they've not been developed, and they're not part of the approval process today.

So these are just a few studies and reports. I mean, I'm just looking at a couple recent ones here, and telling a little story with two or three studies. There's a deep literature, and -- so, bottom line, our position is that, you know, there are real questions.

These things are poorly understood, they need more research, inadequately regulated and under the circumstances, let -- labeling is reasonable, prudent, it's a moderate position, there's nothing reckless or radical about it at all. It's rational. The American Public Health Association, one of the -- the oldest and the largest public health association in the world, supports labeling.

The American Nurses Association, British Medical Association,

Irish Medical Association, lots of professional scientists and doctors in this country, many of them have signed that statement from the European Council. 60 countries -- 64 countries require labeling. So, it's -- you know, that's a very short -- as brief as I could make it sort of position statement, and laying out -- and these are not my quotes. And so -- okay.

Chairman Starr: That's NOFA's position.

David Rogers: This is NOFA's position, yes, and of the coalitions, and of lots of other folks.

Chairman Starr: Chris had a question.

David Rogers: Yeah.

Senator Bray: Thank you, sorry so late, coming from another meeting. I -- your -- so Bt's been around for, you were saying, 50 years?

David Rogers: Yeah.

Senator Bray: Is it that the sort of widespread use of -- and steady use of Bt that's the troubling aspect, as opposed to not Bt in and of itself, but just --

David Rogers: Yeah.

Senator Bray: Now it's become --

David Rogers: Well I'll tell you, there's a lot that can be said about this, and I know you like to dig into it, so I would ask you to take a look at the Freese and Schubert paper. Yeah, I mean, you know, organic farmers use, but I asked Dave before, "When's the last time you used Bt?" And he said he hasn't used

it in five years. So it's used sporadically, it's used occasionally when there's a lot of pest pressure, and it breaks down. The half-life, I think, in sunlight is four days. And as I said in my testimony, that's not the case with this toxin in plants is stable -- heat stable, and it's the active form of the toxin, unlike the Bt spores that are sprayed in organic agriculture. Did I answer your question?

Senator Bray: Yeah. And the other thing is -- just to -- sort of the connection, so it's a GMO labeling Bill --

David Rogers: Yeah.

Senator Bray: But are you bringing up this in terms of, like, the evidence of a public interest that's beyond the label? You know, there's a findings section --

David Rogers: Yeah.

Senator Bray: Talks about --

David Rogers: Sure.

Senator Bray: Reasons since they would have a legitimate interest. I'm just trying to make the connection between Bt and we're talking about food labeling in the Bill --

David Rogers: Yeah.

Senator Bray: In and of itself, so --

David Rogers: Well, there's something like 300 ingredients that are derived from corn in foods -- foods like this, and if it's not non-GMO, it's probably Bt corn. So I think to the -- if people are routinely ingesting this, I mean, the level of

exposure is such that -- and the uncertainty that exists here I think connects the dots on the public health concern.

Senator Bray: I'm sorry, one more mechanism question. So the gene that's in the Bt corn produces Bt. Is that -- any of that survive through into food products?

David Rogers: Yes, it's heat stable.

Senator Bray: So, like, we're not only eating corn, we're eating some Bt along with it?

David Rogers: Absolutely. And this is why the Quebec study finding Bt toxins in the blood of pregnant women and fetal cord blood was so troubling. This -- the Freese and Schubert layout, you know, the companies did tests and said, you know what? This toxin's going to break down in the gut, in the stomach acid, don't worry about it. Well, they document that, you know, the test they used was not valid.

They basically kept tweaking it until they got the answer they wanted. And so, you know, those toxins were never supposed to be getting out of the gut in the first place. They were supposed to break down readily. They haven't. And this is an example of some of the stuff we don't know, for all sorts of reasons. So -- I hope I've answered your question.

Senator Bray: Yeah. Are human cells lining the gut susceptible to having Bt get into them?

David Rogers: Bt does bind to the gut in laboratory animals, and there's a lot of concern that that creates sort of gaps in

the lining that can create problems -- health problems. We don't know a whole lot about it.

Senator Bray: The mechanisms, okay, thank you.

Chairman Starr: David?

Senator Zuckerman: I was at a conference this last weekend, and spoke with a number of the representatives from Monsanto, Syngenta, DuPont -- although I didn't get a chance to chat, and one of the points made to me was that, you know, corn syrup, which is a sweetening agent, is just the sugars, it's not the DNA. That there's no amino acids in it.

David Rogers: Yeah.

Senator Zuckerman: And you had mentioned -- and so I was like, oh, that's an interesting thought, I'd never had -- like, oh, well if it's the genetic material that may be harmful, you indicated a little bit earlier -- I'm not sure you were here, that it's the -- sometimes the byproducts or other things --

David Rogers: Yeah.

Senator Zuckerman: Or I just was hearing that, okay, so maybe the genetic material of the plant is not in there any longer, but that the Bt -- something still is. What -- is that not --

David Rogers: Yep.

Senator Zuckerman: Genetic material? Like, what is that? Is that product or --

David Rogers: I'm not sure if Bt -- if you'll find Bt in corn syrup --

Senator Zuckerman: Okay.
David Rogers: Or corn oil.
Senator Zuckerman: Alright.
David Rogers: But the point I was making earlier is that this process of genetic engineering, and I could share with you lots of papers that are very, you know, on the edge of my understanding that show that the process of genetic engineering itself disrupts the cell. And, you know, back in '92, when I took genetics, and back in '92 when the FDA approved this, our understanding of genetics was like kindergarten compared to what it is now.
And what we've learned is we don't know a whole lot. I mean, we have so much more to learn. This process of disrupting the cell and thereby the cell creating metabolites and changing things that would be found in sugars and oils, we don't really understand it. I haven't tested for it.
Senator Zuckerman: And then to follow up, it's nice to have a scientist because a lot of us have our feelings, but I'm, you know, having someone who can delve in and step -- so with the -- you mentioned that the Bt in some other product rather that corn syrup, may end up binding -- and again, I guess that's just the beginning of the understanding, which I guess is part of the point --
David Rogers: That's right.
Senator Zuckerman: Where you have questions without any answers

and that we're all consuming this stuff before really knowing, but --

David Rogers: At a high level.

Senator Zuckerman: But we can -- so with the Bt, one thing I heard along the way and was wondering if you could either confirm or defuse me of this thought is that if the Bt striates or connects to the stomach lining or gut lining of some sort, it creates those avenues for --

David Rogers: Right.

Senator Zuckerman: Transfer. Is that an area -- I thought I heard there being studies or thoughts about why we would then -- potentially are developing other food allergies, which is -- that aren't even genetically engineered foods, but that normally our system, like, the biology of the human body is if there's a foreign substance in our blood, we attack it.

David Rogers: Yeah.

Senator Zuckerman: And then normally, the food that we eat goes through a system of getting broken down in our digestive system, and by the time we can absorb it in whatever part of our intestine we do that, it's been broken down to the type of thing that our body uses. But that if there are avenues for that to cross the stomach lining or higher up in the intestine before it's been broken down, then we develop the, this is a foreign object allergic reaction. Is that something you can elaborate more --

David Rogers: Yeah, I mean, you know --
Senator Zuckerman: I've heard about that, it sounds spooky to me, but I don't really know the science.
David Rogers: No, I mean, no one knows the science. So this -- we're just learning now that all sorts of stuff transfers into the blood from the gut that we never thought got through, like DNA, like whole proteins. And not only that, I mean, there's a whole area of genetics now called Epigenetics, which says that when these things move into the blood, they move into the cells and they change the genetic structure of the cells.
And not only do they change the genetic structure of the cells in your body, but that's heritable, so that the, you know, sort of the little bumper sticker idea is that, you know, your genetics, your propensity to get disease, whatever, depends on what your grandfather ate. It sounds wild, but we're just learning about this. So to the extent that we damage the gut -- and the gut is a -- we know less about the gut than we do about the ocean -- and the gut bacteria.
So what's going on there? Who knows. We just know that this is a toxin, it does bind to the gut, it obviously gets through into the blood of human beings, it's been found in the blood of other animals, as well. But we're just learning about it. So, you know, the thumbnail takeaway on this testimony is, we have a high exposure, a high level of ignorance, and in the face of that, you know, what do we do? What's the prudent, reasonable

thing to do?
Chairman Starr: Well, but if 90 percent, you said 90 percent of the corn is --
David Rogers: Something like that.
Chairman Starr: So what -- where do we get our corn?
David Rogers: You can -- well --
Chairman Starr: I mean, labeling --
David Rogers: If you don't want it?
Chairman Starr: Yeah.
David Rogers: If you don't want this? Well, there's non-GMO corn out there and there's non-GMO corn products.
Chairman Starr: But there's only 10 percent. If there's 90 percent --
David Rogers: Oh.
Chairman Starr: That have it, that means there's only 10 percent that doesn't have it --
David Rogers: Yeah.
Chairman Starr: If it equals out to 100, so --
David Rogers: Yeah.
Chairman Starr: If 90 percent of the people don't want it, they have to fight over the 10 percent of --
Senator Zuckerman: Well, I think it's also the amount of breakdown of how 90 percent is used. So -- a huge amount of corn is used for animal feed, and I would guess that --
David Rogers: Mostly.

Senator Zuckerman: The 10percent that is non-GMO is probably, for the most part, not animal feed except for the handful of organic or non-GMO animals scenario, so --

(00:28:57) [OVERLAY]

Senator Zuckerman: Human consumption corn, I bet it's a higher --

David Rogers: And it's not a static percentage. As the market changes, and this is already happening, it's in the paper all the time, that as market -- and this is the business of farming, right? As the demand increase for non-GMO corn, the price will be good, people will switch over to non-GMO corn. And they're doing it.

And a major reason they're doing it is because they want to export non-GMO corn, non-GMO soybeans, and companies like Japan or China and other places that buy most of it don't want GMO. So, I mean, you know, it's out there, and farmers are flexible. I mean, it's -- in 18 years, we've had this wholesale change. It can change back if the market dictates.

Senator Zuckerman: I was about to say, it's market-driven. If all of the sudden, the science got a little less murky, for example, I mean, we found out say in five or 10 years down the road that -- or less, that a clear line could be drawn that says it is bad for you, I reckon that that'd flip around pretty quickly, though, and non-GMO corn would be readily available.

David Rogers: And a study -- if future studies, good studies,

the kind that people have been calling for for a long time, long-term studies, and there have been a few on both sides of this, but far too few. You know, if it comes to pass that we -- this is all stuff we shouldn't have been worrying about, then, you know, the market will, you know reflect that. People, even if there is a label, people will say, okay, that's been checked into.

Chairman Starr: So we spent our time and spun our wheels and --

David Rogers: No, no, no --

Chairman Starr: And accomplish what?

David Rogers: We don't know. I mean, what will we accomplish? I don't know. I mean, we need to -- we need a lot more public funding -- publicly funded independent research that digs deep into the questions, these complicated questions related to our new understandings in genetics. And we need to develop really good protocols for testing these things.

Chairman Starr: I understand -- I don't know this for a fact, but I understand that there's a lot of foreign food products that are brought into this country that are basically not checked and --

David Rogers: Yeah, it's true.

Chairman Starr: We don't know a thing about how they -- how they're growing them or any of that, and that's been going on for --

David Rogers: Absolutely.

Chairman Starr: Many years, and FDA and they don't seem to be too concerned.
David Rogers: They should be.
Chairman Starr: Well, I would think that --
David Rogers: You know, what happens is, you know, when things -- when there are acute outbreaks of something, you can then connect the dots between the ingestion of this food and this illness, and the CDC can track that down and get back to it. But in the case of chronic and subtle effects, you cannot do a -- you can probably not do an experiment that's going to be definitive, you won't have the numbers to do that.
In fact, look at all the studies that are done with drugs -- drug testing. They do have pre-market testing. They do run through various phases, and trials, and clinical trials, and they put it out into humans and they take it. But it's only after it gets out into the population and large numbers of people are taking it -- Vioxx is an example -- that you start to -- epidemiologists are able to start to see and connect, and as doctors, report symptoms back to the CDC.
They're able to connect the dots that were impossible to detect, you know, in smaller populations. This is another example of labeling, another benefit of labeling. If we have labeling, we'll then -- people will then know if they are eating, you know, they had GMO corn chips and -- last night, or, you know, they've been eating them for two years, and after a while,

associations can be made.
And maybe something -- maybe some subtle effects could be detected. So labeling's actually a risk management tool for epidemiologists, and, you know, this is the way epidemiology works.
Chairman Starr: Did you have a question, Chris?
Senator Bray: Yeah. It seems like, you know, part of what we're talking about is do we take a precautionary approach and -- outlaw sounds strong, but stop doing things that we don't understand the full consequences of, or do we allow them to proceed until we can see clear evidence of a problem?
Are there -- and so far, we've taken the latter course, you know, and so are there other areas where the government already has a precedent in terms of taking a precautionary approach on a technology like genetically modified foods? Or anything that -- I'm just trying to see if --
David Rogers: Well, you know --
Senator Bray: If we're trying to do something that we just never do --
Senator Zuckerman: We have tended not to that I can think of, but I don't know.
David Rogers: We do label things in a precautionary way. We tell people whether something's been produced in a factory that has nuts, or whatever, allergens. You know, this is precautionary, yes, but I mean, precautionary principle is

something that can be applied radically or reasonably. Radical would be a ban -- this is not a ban.

Senator Bray: Right.

David Rogers: You know, farmers and businesses can go on doing whatever they want to do. Genetically engineering companies can go on developing new GMOs, they can put them out on the market globally. It doesn't prevent or constrain any of that. This is simply a -- I would just call it prudent measure.

Chairman Starr: What -- you work for NOFA, organic farmers, what do they do to raise corn?

David Rogers: Well, they grow non-GMO corn, and --

Chairman Starr: Right.

David Rogers: And they grow it in --

Chairman Starr: Is that a hybrid corn?

David Rogers: Yeah, it could be a hybrid corn, yeah. And hybridization, we've learned, create -- also creates changes that we never thought of. I mean, we're -- what we're learning about breeding of all sorts is, you know, astounding. I think it would be a very exciting time to be a geneticist. But, yeah, there's non-GMO corn out there. Less and less of it. Many organic farmers breed their own corn, open pollenated varieties. And many organic farms don't grow corn.

Chairman Starr: Just grass.

David Rogers: It can -- they -- one reason many times is because they're concerned about contamination from genetically

engineered corn, and they don't want to be contaminated. Also, there may be a problem with controlling pests in a way that's consistently organic principles. You may not have enough land to rotate enough so that you could break the cycle of, for example, the corn borer. So, that's what organic farmers do.

Chairman Starr: Other questions? Eldred? Norm? Anything else, Dave?

David Rogers: No, there's lots, of course, to talk about. I know some have wondered why folks should just not go out and buy organic if they're concerned about it, and I would just say, you know, if you tried -- maybe people who shop at the co-op can do that.

You know, but if you go to your local market in Irasburg or something, you're going to have a pretty lousy diet if you shop organic at -- we think everyone should have this information whether they can afford to buy expensive organic certified food or not. I think the level of information, uncertainty, and, you know, importance just says, you know what? Everybody should have this information.

Chairman Starr: What about where society feeds hungry people? What -- and the cost is driven up --

David Rogers: Globally?

Chairman Starr: Yeah, or even our own country. And cost is driven up to the point where people get food rationed out to them and -- because we only have x-number of dollars, and if you

didn't have cheap food stuff to feed these people with, what --
David Rogers: Well we could still have it. I mean, you know, this doesn't -- people can still grow it, manufacturers can still produce it. You know, Post Toasties can still be on the shelf.
Senator Zuckerman: Then by that rationale, the -- what's the bushel price of corn out West? It's, like, $7, $8 and it used to be $3, $4. Has food doubled? Has --
Chairman Starr: Yeah, but we caused that.
David Rogers: That's an ethanol problem.
Senator Zuckerman: Well I understand that, but I mean, if we're going to argue about feeding the world, there are a lot of other discussions to be had around that in terms of the price of food, in terms of diverting food for ethanol. I mean, this is not going to impact that more --
David Rogers: In terms of responsible agricultural development, as well. The UN did a report a few years ago that said, you know -- I don't think, you know, and this is a whole different discussion unrelated to labeling, it's irrelevant to labeling, but, you know, if you -- we're going to prepare for feeding nine billion people by the year 2050, we're going to have to pay real attention to what it is people are growing, locally developed varieties --
Chairman Starr: You might get more (00:38:57) [INDISCERNIBLE].
David Rogers: Agro-economic practices

Chairman Starr: Per acre, and using our land.
David Rogers: I don't think that the biotech companies are out to develop, you know, products that are, you know, intended to feed the world of hungry and poor people who are not going to be able to afford it.
Chairman Starr: I thought they made a GE product that -- drought resistant.
David Rogers: Yeah, it didn't work out, if you're talking about that one. And, you know, there are other -- people talk about as if genetic engineering came along a few years ago, and suddenly we don't know how to breed plants anymore except with genetic engineering. In fact, breeding technology has developed rapidly, and there are methods that will get you to drought resistance, and have gotten crops to drought resistance more quickly and less expensively than doing it this way.
Senator Zuckerman: There's also more food per capita today than any time in history, and yet, there's still hungry people.
David Rogers: Yeah, it's --
Senator Zuckerman: It's not about --
David Rogers: Yeah.
Senator Zuckerman: Food production. It's about food distribution.
David Rogers: Food access. Food access problem. I've taken up way too much time. I'm sorry.
Chairman Starr: Chris?

Senator Bray: Can I ask just a -- maybe I should save this question -- or offer the question, we can talk about it more. I'm just curious about the impact of genetically engineered plants and the production paradigm that comes along with them on soil health.

David Rogers: Well, we don't know. The soil is another -- I'll say (00:40:27) [INDISCERNABLE], you know, we don't know about it. This -- we don't know all the microbial associations in the soil, we don't know how use -- repeated applications of herbicides, for example, are affecting the microbes in the soil. There is research that indicates that it is causing problems, particularly in soy beans.

But we need a whole -- you know, we need a whole lot more -- people can accuse people who are advocating for labeling being anti-science or Luddites or something -- not true. We need lots more science. We need lots more difficult, sophisticated science.

Chairman Starr: That's what it sounds like to me.

David Rogers: All right.

Senator Bray: Thank you.

Chairman Starr: Yep, thanks.

David Rogers: Thanks.

Chairman Starr: Thank you, David.

Senator Zuckerman: (00:41:10) [INDISCERNABLE] I was told by one person that they're -- some of the GE corn, I think it was the

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Robbins, Russell, Englert, Orseck, Untereiner & Sauber LLP

Margaret: Oh, okay.
Male Participant 1: And I was a bit distracted. So I didn't catch everything you said.
Margaret: Okay.
Chairman Starr: Yeah. Dan?
Dan Barlow: Yes. For the record, my name is Dan Barlow. I'm a public policy manager with Vermont Businesses for Social Responsibility. For those who maybe aren't familiar with our organization, we have, we're a statewide business group. We have 1000 members in Vermont.
(00:01:10) [OVERLAY]
Dan Barlow: We've been around for about 23 years. In addition to the lobbying that I do, we also run an internship program connecting recent college grads with Vermont businesses. We run a Energy Action Network, encouraging businesses to reduce their energy costs and be more efficient in their energy use. And we also have a Local First Coupon Book that encourages people to buy local from Vermont Companies.
I want to thank you guys for taking this Bill up. From BBSR's perspective this is a very important Bill. And we do have some history here before my time with the organization, but about a decade ago. We did support the labeling of GE seeds when that issue was debated in the building as well.
So from -- my members are concerned -- my members believe strongly that consumers have a right to know what's in their

food. You know, my members take kind of a triple bottom line perspective to running their business. It's not just about profits. It's also about people and the planet as well.

So my members believe strongly that consumers have a right to know what's in the food they're buying. And that also there's a concern that Vermont has spent a considerable amount of time and effort over the years building up the Vermont brand. So that, you know, my parents live out in Arizona, I know that if they see a Vermont product on the shelf out there on the West Coast that there are certain expectations that they have about that product because Vermont has done such a great job of building up the brand over the years. And, you know, there's surveys that show kind of what people expect about Vermont food products. And that's going to be natural. It's going to be wholesome. In some cases maybe healthy or delicious as well.

So my businesses are really concerned that having GMOs kind of in the Vermont food systems undermines all the good work we've done to build up the Vermont brand over the years. We polled our members, this is about a year and a half ago. I might have some more recent data in about a month or so, but don't expect this to change. 80 percent of VBSR members think that it should be a priority for Vermont to label GMO or GE foods.

We've seen the market for non-GMO food grow quite a bit over the past few years. So VBSR businesses that, you know, have made the initiative to go non-GMO have seen growth in sales. They're

hearing more and more from consumers that they want more information about what's in the products. And that consumers are moving towards food products that are non-GMO. I know, you know, that there's some food companies in Vermont that are concerned about this. I'll be honest, some of those were our members a few years ago. When we announced back in, I think it was, 2012 that we were going to sign on in support of the GMO Bill, we had a few members, they were, like, woah, wait a second. What exactly are you doing here? So we did our due diligence, formed a summer study committee between the sessions, got a couple chairs, brought about 20 or 30 VBSR members together many who are in this field and would be affected by this Bill. And we hashed out all the issues. We did a deep dive on this and said, you know, does VBSR have to change our own policy on labeling? And in the end we actually re-confirmed our prior position on the seed labeling issue that, again, consumers have a right to know what's in their food. And that GMOs are a threat to the Vermont brand. Our recommendations is, you know -- our expectation is that a lot of Vermont companies that could be affected by this are already looking at alternatives for certain ingredients that are, that comes from GE technology. And that there's actually some really interesting kind of business to business mentoring that's happening right now where businesses that have expertise in this are working with, you know, other companies who probably are competitors in a lot of ways. But

helping them, saying this is how we made the decision, these are distributors you can go to to find non-GE ingredients for your food.

So I think it's really interesting that businesses are working with each other in the field to try to get GE technology out of the food that they're selling. Again, we do recognize that, you know, I think VBSR would love to see a federal approach on this. I think everyone probably would. You know, it would be great if we, you know, this was uniform across all 50 states. I don't think any of us expect Washington, D.C. to take a bite on something like this any time soon when there's this great disagreements on kind of simple things. So if --

Male Participant 1: Like letting people travel across bridges. Oh wait, no. That's a different -- that's a different issue. Sorry.

Dan Barlow: You know, so our recommendation is that if Vermont does take a state only approach here -- and, again we do think we should take a state only approach -- is that there be a delayed implementation period of maybe 18 months to 2 years to allow Vermont food producers to either change their ingredients or adapt their packaging to the new regulations. But, you know, give them the flexibility and an appropriate timeline to make those changes.

And if policy makers in the building are really worried about the small food producers, maybe, you know, some low interest

loans should be made available to food companies to help them make that transition. But, again, our members felt strongly that the benefits of labeling greatly outweigh any of the consequences we're facing. And that state based labeling would be a victory for consumer rights. And would continue to protect the Vermont brand.

Chairman Starr: Wouldn't it -- I mean, I don't know many manufacturers we have in Vermont, but wouldn't it be easier and more simple to just have the people that want a label, label their products GMO free?

Dan Barlow: Yeah. That's a really great question. That's something my study committee looked at, you know, a year and a half ago.

Chairman Starr: What did they say about that?

Dan Barlow: Our concern was that it does kind of put the burden on companies that are non-GMO right now. But the bigger concern that my members had was that it really does leave most of the grocery store in the dark for consumers. They'll see a label on a packaging, you know, that for a product that's non-GMO and say okay, that's great, that they know that that is maybe "safe" or appropriate for them to buy. But for the most part, you know, the other 99 percent of the products on the shelf is still in the dark. They don't have the information to make the informed decision about whether or not they want to buy that product.

Chairman Starr: Norm?

Senator McAllister: Of course. You know, you're named Vermont Business for Social Responsibility. So you feel, you know, and maybe I'm supposing this, but you feel that people who use GMO products are irresponsible then for social responsibility.
Dan Barlow: I wouldn't say that at all. Absolutely not. And I --
Senator McAllister: What would the inference be if the people who are for that are figuring the other people are not?
Dan Barlow: I think we are for labeling. As I think --
Senator McAllister: No, that's not answering my question.
Dan Barlow: I wouldn't say -- I don't think any of my members would ever say that anyone using GE technology in their foods are being socially responsible.
Senator McAllister: Irresponsible.
Dan Barlow: Irresponsible. I don't think we would say that. I --
Senator McAllister: There has been a few, but, okay.
Dan Barlow: Yeah, I've never heard any of my members kind of make that claim. So, and I've also, you know, I know the previous witness mentioned, you know, banning GMOs. Again, you know, none of my companies want to ban GMOs. In fact if this was a Bill to ban GMOs I wouldn't be sitting here testifying in favor of it. That's not something my organization wants. And, you know, I haven't heard anything from, you know, even bigger brands from Ben and Jerry's that's working on this issue

on a national scale -- I haven't heard anyone say that's something they want to see is the banning of GMOs. We want to give the consumers the information that they need to make the right choice.

Senator McAllister: You obviously weren't here eight years ago or so, because many of them did.

Male Participant 1: And I -- I guess I would just say that I think over time a lot of people's positions and thoughts, and, you know, desires have changed over the years. I mean, I know my thoughts have been -- probably was an original sponsor of the ban five years ago. I don't know that I would sponsor that Bill today. You know, I think it's important whether we're talking about bST and what happened then -- it's, you know, 15, 20 years later now. People's positions, I think, do evolve.

Senator McAllister: And my other question would be, so do you feel -- why would the information -- would you feel -- your people feel that it's dangerous for people?

Dan Barlow: When we looked at this issue we didn't make any judgments about any health consequences, you know, where -- I'm not a scientist. We don't really have -- I don't think we have any scientists in our businesses organization. We did talk to some experts. But we kind of -- I think our policy recognizes that there is a lot of debate on GMOs and GE technology and that there's concern out there.

So we didn't make any judgments about health consequences or

safety consequences but just recognized that people have concerns about those issues.

Chairman Starr: So if we pass a Bill that requires GMO labeling most of our food is imported, and how are we going to convince manufacturers in the Mid-West or wherever they are that if you're going to bring food to Vermont it's going to have a label on it? How, I mean, we're 600,000 people.

Dan Barlow: Sure. Yep.

Chairman Starr: Less than most cities.

Dan Barlow: Yeah.

Chairman Starr: So how -- it would be a like a small city passing a city ordinance. So how are we going to take care of that?

Dan Barlow: Yeah, I don't know if Frit O Lay will suddenly stop bringing products to Vermont if we do this. You might have to ask, you know, some of the national chains. My expectation is that, I mean, Vermont's not the only state working at this, obviously. And I make more, and more you're going to see a patchwork form over --

Chairman Starr: So shouldn't we team up with other states where there's a few people that might be able to help us push this along?

Dan Barlow: Are you asking about whether or not there should be a trigger in the legislation or?

Chairman Starr: Well, I mean, it would just make sense to me

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Bobby Starr: Zach?
Zach Mauldin: Mm-hmm.
Bobby Starr: Yeah. Norm?
Norm McAllister: No, I'm good.
Bobby Starr: No.
Mike O'Grady: Now, moving down onto the exemptions. There is a fairly long list of exemptions and as Senator Zuckerman just referenced, now part of these exemptions are to mitigate any potential claims that could be made. And the first exemption is that food consisting entirely of or derived entirely from an animal, which it has not itself been produced with genetic engineering, regardless of whether the animal has been fed or injected with any food or drug. You might think that's a fairly broad exemption, but food consisting entirely of or derived from the animal, that's gonna be slaughtered meat in one instance, right? And the Food Safety Inspection Act regulates labelling of slaughtered meat. So, there should not be a conflict with that labelling requirement, so we are exempting that type of slaughtered meat from this labelling requirement. Similarly, milk is produced entirely from an animal and there are standards of identity and requirements for the labelling of milk under the Food and Drug Act. And remember when we discussed this last week, there's an expressed pre-emption provision in the FFDCA for those foods that the FDA has expressed standards and identities for. So, that type--it might be broad, but

slaughtered, already labelled according to the FSIS.
Bobby Starr: Yeah.
Mike O'Grady: Milk already has a standard of identity under the FFDCA. We're not gonna regulate that. So, moving down. Then, you have the raw ag commodity that has been grown, raised, or produced without the knowing and intentional use of food or seed produced with genetic engineering. Whether or not you went to a soybean silo and bought your seed and you were told you were being buying the non-GE-produced soybean, but it turns out there was some cross-contamination in the silo, etc, and you went out and you planted that soybean and you did not know or intentionally use soy seed from--that was produced with genetic engineering.
Bobby Starr: So, do--at the present time, the seeds have to be [INDISCERNIBLE 00:04:04]. Is that on the bag, like when you buy corn?
Mike O'Grady: We already have a requirement in the state regarding seed and it needs--
Bobby Starr: And they have to sign a form--
Mike O'Grady: They need--it needs to be labelled if it's produced or partially produced with genetic engineering.
Bobby Starr: Yeah, so.
Chuck Ross: So, that would be--because we heard in other testimony that--what was it--98% or 99% of all soybean has GE traits in it.

Mike O'Grady: It's--I believe it's 88% of soy.
Chuck Ross: What do they--okay.
Mike O'Grady: No, it's 93 of soy and 88 of corn.
Chuck Ross: Okay. So, anybody--but if they're purchasing it from someone, that doesn't have to be certified, I mean, like it's been passing--
Mike O'Grady: Well, what you have to do, there has to be an affidavit in order to qualify for this exemption. It will be deemed--as being knowingly produced--or not knowingly produced with food or seed produced with genetic engineering. If they obtain from whoever sold the commodity or the food to that person's sworn statement, that the commodity or food has not been knowingly or intentionally produced with genetic engineering, has been segregated from and has not been knowingly or intentionally coming [PH 00:00:23] through, that may have been produced with genetic engineering. So, you can get an affidavit, a sworn statement from your supplier that it is in the supplier's assertion. It has not been produced with genetic engineering and that suffices to--for an exemption from the labelling requirement for raw agricultural commodity.
Chuck Ross: So, someone tested a product afterwards and they found GE and--
Mike O'Grady: You have your sworn statement and there--you will see later on that the retailer liability, the retailer can rely on that sworn statement.

Chuck Ross: But does it go--I mean, what's the liability go back on? It goes back on the producer?
Mike O'Grady: Well, for--remember, for the raw agricultural commodity, it's got to be labelled on the package--
Chuck Ross: No. I'm talking about an ingredient, for an instance, if I've used soybean to make something and somebody test it and they find GE product. And I'm not liable because I've got a sworn statement from somebody, who said that they sold me--
Mike O'Grady: Right.
Chuck Ross: --GE-free--
Mike O'Grady: Right.
Chuck Ross: --seed, but I'm assuming that my product would get pulled and would have to be labelled now.
Mike O'Grady: Right. From that point on, you know you can't rely on the sworn statement at that point. It--
Chuck Ross: So, there should be a liability that goes back onto the person, who sold you the seed originally?
Mike O'Grady: Well, they're not offering it for retail sale. Remember, this is only when the--so, there would be no liability at that point because you would be exempt because you relied on the sworn statement. They weren't selling the food at retail sale. They were probably selling it at wholesale, so there is no liability at that point, but going forward, you would need to label that food as produced with genetic engineering because you

could no longer rely on their sworn statement.
Chuck Ross: So, if I were harmed by that--in other words, I lose my market, for instance--I have no recourse?
Mike O'Grady: Well, depends on how you entered into the agreement of purchase, that commodity or that product from the supplier. You could have a contract with them, you know, whether or not you're a small grocer that's buying food from a farmer in the area. And some of those farmers, some of the small grocers, like Healthy Living, they have an agreement with their suppliers and they need--potentially have a breach of contract thing.
Bobby Starr: But it's only at the retail end this labelling comes into effect?
Mike O'Grady: Yes.
Bobby Starr: So, C&S Grocers that handles thousands of tons of food products that they don't sell retail, they just sell wholesale, they aren't affected by--they don't have to have label products?
Mike O'Grady: Yes and no. I mean, the bill does not require the wholesale seller to label the food because the bill applies to food sold at retail.
Bobby Starr: So--
Mike O'Grady: But--
Bobby Starr: --it's all gonna fall on the--
Chuck Ross: Store owner.

Bobby Starr: --the retailer.
Mike O'Grady: But remember, the retailer is gonna want to know that all their processed food complies with the requirements of the law, so when they purchase food from a wholesaler, they will have--they will want the food that's properly labelled. So, although there's no requirement for C&S or other wholesale distributors to label, they're gonna have to provide product that is labelled.
Bobby Starr: Only if their people that buy from them require--I mean, get--gathers a group and require them. There's no law that says they have to.
Mike O'Grady: That--
Bobby Starr: So, it all falls back onto the mom-and-pop and the local grocery stores to make sure that it is--
Eldred French: That product is--
Bobby Starr: --it is either GMO-free or if it has GMO in it, to put a little label on their unit pricing shelf or something. The big guy's gonna get away, I would say, pretty easy.
Mike O'Grady: Well, we'll get to the retailer liability piece in a minute.
Bobby Starr: Oh, okay.
Mike O'Grady: But for processed food, I still believe the attorney general has the ability to bring enforcement against those processed food that are out there that aren't labelled properly.

David Zuckerman: The matter wouldn't be the retailer's responsibility.
Mike O'Grady: We'll discuss that one when we get to the--
Bobby Starr: Okay, when we get to the wholesale.
Mike O'Grady: There is potential if the retailer's the one that actually--it's their brand and--or their--
David Zuckerman: Yeah, but how many mom-and-pops have their own brand? I mean, I think--
Chuck Ross: They don't.
David Zuckerman: Your question was about those guys.
Mike O'Grady: Right.
David Zuckerman: And they're not gonna have an issue--
Mike O'Grady: Mm-hmm.
David Zuckerman: --because they don't run the, you know, Bob's, you know, store and hardware retail.
Mike O'Grady: Right. And so, you'll see that--
Bobby Starr: [INDISCERNIBLE 00:00:48]
Mike O'Grady: --there is a provision that's been added to address that type of situation.
Bobby Starr: Okay. Yeah.
Mike O'Grady: So, that brings you to page 12. Another exemption is any processed food, which would be subject to the labelling, the mandate that it has to be labelled that it was produced with genetic engineering solely because it includes one or more processing aids or enzymes produced with genetic engineering.

There is an FDA provision that says food produced with processing aids or enzymes is not subject to labelling, and so that's why the exemption is in there. Then, you come to alcoholic beverages. They are not subject to this requirement. There are federal labelling requirements. You've all seen them, so we're not trying to regulate alcoholic beverages or try to, in any way, adopt anything that could conflict with the federal labelling requirements.

David Zuckerman: And this, again, reflects back to the earlier testimony--sorry--regarding when you did this, sort of, legal walkthrough--

Mike O'Grady: Mm-hmm.

David Zuckerman: --that this bill was crafted in a way to not conflict with the federal restrictions on [PH 00:02:03] importing requirements.

Mike O'Grady: Right. It's really crafted in a way not to conflict with any federal provision, whether or not it's the FDA or the Federal Meat Inspection Act or any federal requirements for labelling alcoholic beverages, any federal requirements for labelling medical food, the--

Bobby Starr: So, you--but if you have hops to make your liquor with and they're grown from GE seeds, and then you drink the liquor, I mean, I don't see that being any different than--

Eldred French: Drinking soda itself.

Bobby Starr: --tomatoes or seeds that are--GE seeds for tomatoes

and you'll eat the tomato, [PH 00:02:50] wine--
David Zuckerman: Well, then eating the food directly, there's a difference, I mean, process-wise.
Mike O'Grady: I think what's different is the regulatory structure that's in existence for alcoholic beverages right now. That's what's different. It's, kind of, like you--my kid uses Legos, right?
David Zuckerman: Hmm, I don't know.
Bobby Starr: I guess.
Mike O'Grady: And in order to get--in order to fit the Lego brick on the other bricks, there's the little points that stick out, right? And so, the points that are sticking out right now is the existing law that's out there, whether or not it's the FDA or the Federal Meat Inspection Act, etc. We can fit a brick into those gaps and, therefore, regulate the labelling of all food, but we can't fit bricks into where it's already stuck up, where there's already bricks on a base. And the base that's out there, the existing regulatory base, whether it's the FDA or the Federal Meat Inspection Act or the labelling of alcoholic beverages or food and drug requirements for the labelling of medical food, the state law cannot address that. We have to fit our law within those prongs of the brick. And so, what we are--the bill is regulating is within the prongs of the brick.
Zach Mauldin: So, question--
Bobby Starr: I guess you're--the only thing is we're--we have

more and more, every year, of people that manufacture alcoholic beverages here in the state from wine to liquors and--

Mike O'Grady: Right, to liquor, to beer, whatever. Exactly.

Bobby Starr: Yeah. I mean, a lot. And--but they aren't gonna be subjected to any of this. You know, we do have Vermonters that consume all those products.

Mike O'Grady: They would be exempt from the bill as it's drafted now.

Eldred French: I think that, you know--the reality is what you're saying is that yes, if the intent were to be able to inform the public that it was in the state's interest that every single thing that was GE-engineered could be regulated, it could be labelled, that would be great, but in the real world, in order to--in order for this bill to have a chance of succeeding, you take what you can get or what you can't get for those things that already have federal regulations that you go up against. Is that--

Mike O'Grady: That's true.

Bobby Starr: Well--

Mike O'Grady: And my metaphor apparently failed, but that's basically what I was trying to say.

David Zuckerman: So--

Eldred French: I hate Lego, so I did [PH 00:00:47] whatever suit your study.

Mike O'Grady: Sorry.

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Vice Chair Zuckerman: David Zuckerman, Vice Chair of the committee, farmer in Chittenden County.
Senator McAllister: Norm McAllister from Franklin County.
Senator French: Eldred French, Rutland County.
Chair Starr: And we have Senator Bray who is not with us yet but will be coming and joining us. We have Jane Clifford from the Green Mountain Farmers Federation, and --
Faulkner Schilling (00:00) [PH]: Faulkner Schilling from Guilford (00:00) [PH].
Male Participant 2: Chelsea.
Chelsea Bardot Lewis: Chelsea Bardot Lewis, Agency of Agriculture.
Chair Starr: And Chris Bray just came in and we have our assistant, Linda Leehman here with us. So we have the GMO bill, H.112, before our committee and have taken some testimony in regards to it. And so we'd like to hear your thoughts and ideas.
Gary Hirshberg: Well, thank you. And can you hear me okay right now?
Chair Starr: Yep. Yep. Very good.
Gary Hirshberg: Okay. Wonderful. It's not as easy to hear you all but I appreciate the introductions and I thank you. And I do want to apologize up front that I'm not physically there. I drive, you would think -- my daughter's at Middlebury and obviously we've got plenty of farmers I'm always visiting all

around you.
You would think it should be easy. But I'm headed to DC to actually testify early tomorrow morning so that's what prevented me from being with you. But again, thank you for allowing me to do this by phone. Let me just say, Senators, that I have read your bill H.112 multiple times. I am particularly familiar with it because, of course, the deliberations of the House. I will say that I'm in full agreement with the findings in the bill, particularly the emphasis on potential risks and I'll try to speak to that. I don't want to take a lot of your time especially by phone. And I'd also like to try to answer your questions so let me do my best to get through some information here in as few minutes as possible. And then we'll take whatever time you have for me to try to answer any of your questions.
Just to be clear, in addition to chairing Stonyfield, which I assume you all know we're definitely one of Vermont's largest milk purchasers -- most of the organic milk in Vermont actually comes to us -- I also represent the Just Label It campaign, which is a national effort supported by about 700 institutional full profit and non-profit partners representing healthcare, consumer advocacy, religious, academic, environmental, food, farming constituencies based in DC. And to be clear, Just Label It's primary objective is to secure federal labeling of GE for all of the reasons that you have in your findings and your

preamble to your bill. We believe that the very same conditions hold true and that it's time for federal labeling, it's time for America to join the 64 other nations in the world who offer mandatory labeling to their citizens. That, by the way, means that 60 percent of the world's population actually lives in countries where labeling is required. We were successful in securing 1.4 million petitions to the FDA. As you read in your findings, the FDA has a definition of materiality going back to a voluntary guidance from 1992 where they, you know, feel that these foods are similar -- materially equivalent to non-GMO and therefore they have not mandated labeling. But despite the 1.4 million signatures, we're still lacking federal action. That's exactly why I'm headed to the hill tomorrow. Over 200 companies are presenting a letter to the President and we're meeting with the Senate and the House members in support of mandatory labeling there. But while I'm actively involved in federal, it goes without saying that I support disclosure wherever it is and surely that means at the state level. And it's important to underscore as I'm sure I don't need to tell you that there's lots of precedence where states have had to get out ahead of the federal government: the suffrage movement, menu labeling, banning trans fats, banning BPA, privacy laws. In many cases states have had to act before the feds. And in this case that action is very appropriate because we actually have a fundamental hypocrisy in Washington right now, nothing new to

any of us, I suppose. But in this instance you've got the US Commerce Department and specifically the Patent Office who clearly see these new organisms as something unique for the grants of these seed chemical companies, hundreds of patents for these new life forms, defining them as absolutely unique. You clearly could not win a patent if they weren't seen as unique. And yet over at the FDA as I mentioned and as your findings summarizes, the policy of the FDA -- but despite the fact that the Federal Food, Drug, and Cosmetic Act requires the FDA to prevent consumer deception by clarifying that a food label is misleading if it omits significant material information. Nevertheless, the FDA adopted a voluntary guidance in 1992 to say that they define material by the ability to be sensed by taste or smell or other senses. In other words they said that they are substantially equivalent because you can't taste or smell or see the difference. And, you know, clearly that's not only an old 21-year-old policy that that is out of touch with today's reality where GE foods are now -- GE crops are now in 80 -- GE (00:26:34) [PH] enhanced, excuse me, are now in 80 percent of processed foods. But it's also, again, hypocritical and inconsistent with the federal -- with the Commerce Department, which sees these as completely unique. So we believe that action at the state level is necessary to wake Washington up. Obviously you're aware 26 states have been debating this issue this year. My state legislature here in New Hampshire is

scheduled to vote on it today actually. You're well aware that it's been passed in Maine and signed into law in Connecticut, but again contingent, as is the Vermont bill, on other states pass it. So let me just make several key points. First, I want to be very clear that Just Label It and, for that matter, I am not anti-GE. We have many concerns about the absence of independent, longer term, third party safety and health testing as is described in your findings, either conducted or funded by parties other than the chemical companies who hold the patents for these crops. But we are not opposed to the use of GE technology, per se. I gave a speech this Sunday to about 600 people in (00:27:46) [INDISCERNIBLE] where I explained that, you know, there's a million diabetics alive in this country, thanks to advances in genetically engineered insulin. So I think to be opposed to GE is to say we're opposed to science. But we are absolutely for transparency. And there's a principal reason that we believe that this is despite the FDA's limited definition of materiality of why we believe this is material to the average consumer. And again this is largely consistent with your findings in your bill. But to be very explicit, as I mentioned, GE soy, for example, makes up about 90 percent of the soybeans grown in the U.S. And GE corn is now roughly 85 percent of corn according to the latest USDA calculations. Sugar beets, cotton are now growing in dominance to almost the same levels. And unfortunately most of us as citizens believe

that these new patented life forms are safety tested the way new drugs are by the FDA and they aren't and they, of course, should be. As your findings represent, several National Academy of Science studies have affirmed that GE crops have the potential to introduce new toxins or allergens into our food environment. You have that under your finding 3-C. But again, unlike the strict safety evaluations for approval of new drugs, there's no mandatory human clinical trials of GE crops, no tests for carcinogenicity or harm to fetuses, no long-term testing for neurological health risks, no requirement for long-term testing on animals and there's actually limited assessment of the potential to trigger new food allergies, which is now in the literature one of the fastest growing concerns. And my belief is that while science sorts this out, and again an FDA policy that depends strictly on the patent holders, essentially the fox is in the hen house, defending their science, you know, we do believe that longer term independent science is needed. But while science sorts this out and while this debate rages on and we believe it will rage for decades to come, we just simply believe that consumers should have the right to know whether they're buying, eating and feeding these foods to their families. The third point I want to make is that I want to be very, very explicit on this point because there's a lot of charges that go around. We do not contend that GE foods are unsafe or bad for your health. That's not the reason we're

advocating labeling. Frankly, if we believed that they were unsafe, we'd be advocating banning. And that's what we do in this country. But, you know, if an ingredient poses a food safety hazard, we don't label its presence, we take it out. But when our government determines that labeling is required for additives like food colorings or dyes or various other byproducts, it's not because they're found to be unsafe. The Federal Food, Drug, and Cosmetic Act, as I mentioned, establishes that the consumer has a right to know when something's added to a food that changes it in a way that a consumer would not likely recognize unless labeling is required. And there's all kinds of precedence. For example, eradiated foods now, we have mandatory labeling but nobody can contend that eradiation is harmful or not. That's not why it was labeled. It was labeled because the FDA determined that it was material to consumers.

They found that the process of eradiation caused concern. And that was simply the basis for it. And, of course, 50 years ago we didn't label calories, fat, salt, kinds of fat. And if you go back in the literature, you find no surprise I'm sure to any of you in the Senate there was huge controversy about whether to label those things.

People charge, oh, it's going to be skull and crossbones and you can't make salt a bad thing and -- but now we know that this information's really important to us to make informed purchasing

decisions. Though nowadays we're required to label potential allergens and production methods, for example, made from concentrate.

Orange juice made from concentrate must be labeled. But I defy anybody to tell the difference in taste or smell between orange juice from concentrate and not. Wild versus farmed has to be labeled -- again, it's not a safety concern. It's just of a concern to consumers who prefer for whatever reasons, economic, religious, or other that they don't want -- they want one versus the other. A country of origin. So simply put, these processes were found to be relevant and therefore material to the consumer. Our belief is that the only reason that GE has not fallen right into that same pattern is the enormous amount of lobbying dollars that have been spent. And you've certainly seen evidence of that in Vermont. So let me cut to the key issue of materiality because there is something that I believe at the federal and state level has been missed in the whole debate. It's clear that there's a lot of reasons to label. There's religious. There's moral. There's economic, ethical and so forth. But what is explicitly material and what I'll be testifying on tomorrow is that the primary genes that have been introduced into GE crops enable, as you know, increased insecticide or herbicide resistance. And any of the farmers in the room know perfectly well that historically, you know, we use herbicides. Farmers use them carefully. They're expensive. And

we use them usually preseason, at the beginning when the seedlings have gone in the ground to give our crops a little bit of a head start over the weeds as the seedlings come up. But, in fact, what was promised back in the 1990s leading up to 1996 when the first herbicide tolerant corn and soy were ultimately approved it was promised that we would see much less herbicide usage as a result of this new technology. There's ample testimony from the public record. And in both cases, with insecticides and herbicides, we've seen absolutely the opposite of what was promised has happened, for example, one of the very first genetically engineered crops that was allowed into the commercial market for human consumption was an herbicide tolerant corn with an insecticide built into its DNA. I'm sure you're familiar with it. It's known as Bt-corn. And in the first 15 years, insecticide spraying specifically to prevent corn and cotton insects actually did drop by 123 million pounds as promised and, yes, this is USDA data. But an alarming paper came out in the fall last year showing that corn growers are now actually becoming resistant to one of the Bt-insecticides that was bred into the corn. And so, you know, as I often say to audiences, you know, nature doesn't wait around to do focus groups when it's under assault. We've overused what used to be a very effective and even organically approved insecticide. But in overusing it now we're building resistance. But even a greater concern -- and again this is all yet to be debated and

worked through in science. The other promise that was made and I have testimony on this is that they reassured regulators that the insecticide would not survive a few seconds in the human gastrointestinal tract and that it would actually be broken down in our saliva when you ate it. But a study published two years ago in the Journal of Reproductive Toxicology, I reveal that the insecticide was actually detected in the umbilical cord blood of pregnant women. It was actually conducted just north of us in eastern townships in Quebec. But it's actually been repeated there multiple times. So, in fact, the promise that this increased use -- so while we're spraying less, the fact is we're spraying less because it's now in our food and the promise that it wouldn't be in our bodies is simply not been born out in science. Where this gets even more alarming, I think, is in insecticide use -- I'm sorry, herbicide use. The exact opposite, as I mentioned, of what was promised has happened. A peer review paper published last summer showed that the three major GE crops in the US, again corn, soy and cotton have increase overall herbicide use by more that 527 million pounds between '96 and 2011 compared to what would have been likely in the absence of GE crops. And you should know these numbers are not in dispute. I've met with plenty of officials at Monsanto and Dow and they, you know, the numbers are what the USDA reports. And we're just about get 2012 data now and, again, it looks to be the same. So let's just put this in graphic terms for you.

In 1996, the year that these crops were introduced, about 14 million pounds of glyphosate or Roundup as we know -- it's the active ingredient in Roundup -- were sprayed on these three major crops. It was about 4 percent of total pesticide use. But in 2012, nearly 300 million pounds were sprayed compared to the 14 million. That's now three-quarters of total pesticide use. And the evidence that this is out there is from the US Geological Survey who's now reported that glyphosate is a common component of the air and rain in 60 to 100 percent of rainwater samples in Iowa during the spring and summer. And, of course, we're all downwind from Iowa and, of course, anywhere else that the Roundup Ready crops are being used we're having the same pattern. And so, again, one can debate perhaps and I'm in these debates often, whether, you know, Roundup is a dangerous herbicide or not. But again, we've never tested at these levels. And so when I read your findings in the preamble to your bill, it's absolutely clear that this has to be researched. We have no idea what the safe levels are for cumulative exposure. We have no idea what the synergistic exposures are. But what we do know and it's not in any way controvertible. It's not debatable -- is that the use of these crops has resulted in significantly more herbicides. So, in effect, the GE crops have been primarily engineered not really for increased nutritional value or consumer benefit but to make it easier to control certain insects and spray herbicides, killing weeds but

leaving the crops unharmed. Now, you know, it's a real money maker for the industry, which, of course, charges more for the seeds and then sells more herbicide to the farmers planting the seed. And as I often say to audiences, I wish I could say that this was the end of the problem, but sadly -- and this is really relevant to Vermont or to New England -- this is unfortunately just the beginning of the problem because now we have recorded 26 different species of weeds, which I'm sure you all know about that are now resistant to glyphosate, again, from overuse. I testified in Arkansas earlier -- or last year -- and a farmer there told me that he had pigweed in his soy crop that was the diameter of his forearm in width and it could stop his combine in its tracks. He said that the only way he can control these weeds is with either machetes or chainsaws. And so these super weeds are now present in 50 to 75 million acres and more than half are safe. And again, they're now showing up across New England. Now what's happening is several chemical companies are responding by designing GECs that actually tolerate multiple herbicides. And the most pernicious of those is one that you may have read about this past week, which is Dow has now introduced a genetically engineered crop that is corn that is tolerant of 2,4-D, which is a much older, higher risk, phenoxy herbicide. You and I would know this as 50 percent of what we used in Agent Orange in Vietnam. And is it clear -- it's clearly dangerous. It's clearly carcinogenic. And literally farmers are being told

when they get resistant weeds to mix in about 10 percent solution of 2,4-D into their herbicide mix to boost effectiveness. But again we're now seeing 2,4D resistant weeds already emerging. So what you have here, just to summarize and not be the most depressing guy you heard from today. What you're seeing is that we're using more and more herbicides and stronger herbicides. We're building resistance, which just use even more. And this, I believe, is what's material. To me, it's like, you know, putting out a fire by putting gasoline on it. And the projections going forward are, of course, for dramatic increases. At the American Weed Science Society meetings this summer this was the topic, herbicide resistant weeds and what we're doing about it and why this is really the wrong direction. And to be clear, the problems of increased herbicide use go beyond weeds. There's now study reports out that there's a greater soil compaction that results because of killing off soil microorganisms. There's threats to pollinators. We're seeing evidence that monarch butterflies are being very adversely affected by overuse of herbicides and so on. So the bottom line to me is while we might debate and we will debate for decades whether GE crops themselves are safe or not, we are not arguing that labeling should be done because they have proven to be unsafe. They can't be proven either way. But there's no question that they're accompanied by an increased use of toxins and that we're playing with fire. I'm going to wrap up but I

just would want to speak if I could to two last very quick issues because these are the issues that are playing down here in the New Hampshire House and I know that they'll be playing in your minds up there and -- when the House deliberated. One is, of course, the question of constitutionality. And I'm sure I don't need to elaborate on your very own Vermont Law School report that recommended that this passage of this bill will stand up to constitutional muster. This finding has been replicated by other -- I'm not an attorney. I don't pretend to be, but other legal folks around the country have also validated that very same finding, that the three tests of constitutionality are held up and, again, that the federal government and the state governments have the rights to do this. But particularly in your case, because there is no federal policy, there'd be no pre-emption by your action. And that leads to the other point I want to make, which is the subject of a full page ad that ran in every one of our papers here in New Hampshire this weekend put out there by the biotech industry and the New Hampshire grocers, which claims as we've seen in many, many states that the use of this technology is going to drive up food costs. And here is perhaps the place that I'm most knowledgeable because obviously as a food processor, I have a good sense of what goes into our costs. What I wanted to underscore is that in the 64 nations around the world, particularly all of the EU, Brazil, Japan, there's exactly zero

evidence that the labeling has increased food costs. As a matter of fact, in Brazil, where the fear is quite aggressive -- it's literally a triangle with teeth that's put on the packaging that specifies a gene donor, so it's really, you know, scary and overt. It has not affected food prices. It hasn't even affected consumer behavior for that matter. In fact, the lawyers who've been involved with adopting that labeling legislation there have commented that the consumers have remained loyal to the brands and have not been affected. So again the fear tactic, the skull and crossbones, is going to drive up consumer food costs and so on is really ill founded. You know, companies change their labels all the time. Every time a new Disney movie comes out, most of the big brands change their label to put whoever it is, you know, on the front. Stonyfield ourselves, a relatively small company in the big picture, we change our labels once a year. And no consumer has ever seen a cost related to that. The great fears about sequestration of separate supplies and so on is all trumped up basically in my view to protect the process of the chemical companies who are selling this stuff. So, you know, just to summarize, we do see again and again in many states -- we see the kind of spending that these companies are doing. I've seen and heard the threats to Vermont that they're going to be sued. I think the current -- this bill, H.112, very wisely

and intelligently addresses that problem by ensuring that Vermont would not go into this alone, that four other states would be required.

I think that the real truth is and I'll just close on this point is that when four or five states do pass this, it's inevitably going to move to the federal level. I just received word yesterday, Oregon is absolutely going ahead with the Citizens Referendum.

So here goes the forward public battle. Tens and tens of millions of dollars have been spent to fight the other two. I expect the other side will spend that again to fight Oregon. But I do believe that this technology's with us over the long run. Again, we're not irresponsibly saying they're dangerous, that's why we're saying they should be labeled.

We're saying consumers simply deserve that right to choose. And so I obviously strongly support H.112 and really appreciate the opportunity to speak to you today. So thank you.

Chair Starr: Wow. Thank you very much, Gary. And you certainly sound like you've done your homework and have talked about this subject many times. Could you tell us a little bit about -- you said New Hampshire's up for a vote today?

Senator Hirshberg: Yes. So what's happening here is that Connecticut and Maine required that, just as with H.112 that four other states in the region need to pass. In other words, it doesn't become law unless other states are doing this.

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Chair Starr: We'd like to hear what you have to say.
Male Participant: That sounds good.
Senator French: Eldred French, from Rutland County.
Senator Bray: Chris Bray from Addison County.
Vice Chair Zuckerman: David Zukerman from Chittendon County.
Senator McAllister: Norm McAllister from Franklin County.
Chair Starr: And I'm Bobby Starr, and I'm from Essex-Orleans County which is way up on the Canadian border. So --
Male Participant: Right.
Chair Starr: Good morning, and welcome. We had witnesses starting at 9 o'clock and concluded with our witnesses. So we're here to see what you folks have to say from Oregon.
Dr. Donohoe: Great. And I'll tell you, while I do not live in Vermont, I spent a number of years in Boston during my training and I've been to your beautiful state many times and enjoyed it.
Chair Starr: Thank you.
Dr. Donohoe: So I'll give you just a little bit of my background. And I think we have about five minutes total. Is that correct, Linda?
Chair Starr: Well, we aren't that crowded for time, so we can give you 15 minutes with questions and everything.
Dr. Donohoe: Okay, that sounds good. I'll provide just a little bit of background and maybe give a little bit of overview about my involvement in this sort of work before and my general opinion about the type of bill that you're considering. So I'm a

physician. I started at UCLA, did my training at Brigham and Women's, did my fellowship training at Stanford, and then have been in and out of academic medicine and currently am an adjunct associate professor at Portland State University, practice internal medicine and have been involved in the GMO issue for about 12 years now. And I was involved in the Oregon ballot measure back in 2002 which went down to defeat quite soundly, compared with the California and the Washington ones. We were beaten about 70 to 30 percent. I think, in part, that's because we are enormously outspent by out-of-state money. And my interest in this area is that I do a lot of work in public health. And I'm the author of the book, Public Health and Social Justice, which came out this year from Wiley and also run the Public Health and Social Justice Web site which is the most visited site for that particular field. So in terms of GM crops, they're something that really just kind of snuck up on society. And they've been commercialized since 1994, as you know, and they're planted on 420 million acres in 28 countries around the world. 80 percent of our processed food contains at least some genetically modified crops. And today there's fewer and fewer corporations that are involved in seed sales -- 10 corporations control 73 percent of seed sales and just 3 corporations control 53 percent of all seed sales, most of which are genetically modified seeds. And in terms of how they're regulated at present the USDA does field testing, the EPA does environmental testing.

The FDA has said that they are "equivalent to non-GM foods." Although the person who oversaw that process, Michael Taylor, went from the FDA to became a vice president at Monsanto which is the largest seed company in the world. And the U.S. Department of Agriculture's Inspector General, in 2006, said that the Department had failed to adequately regulate genetically modified crops. So I'm happy to answer questions about the health effects as time goes on. But in terms of labeling measure, for me and for my colleagues with whom I've worked on this, which includes people at Consumer's Union, the Union of Concerned Scientists, the Center for Food Safety and Oregon Physicians for Social Responsibility, this is an issue of choice. It's allowing consumers to make an educated decision with the freedom to decide what they wish to put in their mouths and their children's mouths. About only 26 percent of Americans, in fact, think that they've eaten any genetically modified crops. So it's certainly an area of which there's widespread misunderstanding and ignorance and basically lack of awareness. Part of the reason, in addition to the freedom to choose issue, is that this would allow for a debate about the merits of GM foods. We currently label foods for a number of different things, from their vitamin and mineral content to their calories to the types of fat, presence of sulfites, where their proteins are sourced, whether they're Kosher allowed, union made, et cetera. So this would be basically just adding

another item in the educational arsenal for consumers to make that choice. And so some of the arguments that have been made against food labeling, that it's confusing or they would cost lots of money, that consumers are ill-equipped to deal with understanding food labels, I think don't necessarily ring true. Because already today, if you read food labels, you can see that there's a lot of very scientific terms that most consumers are probably not familiar with, which is in contrast to your bill which is basically just going to say that the food comes from crops that were created with genetic modification, including the (11:54:10) [PH] prodicil about the FDA.

Chair Starr: Are you there, Martin?

Dr. Donohoe: I'm here.

Chair Starr: Yes?

Dr. Donohoe: So I can give you a little vision on the health effects.

Chair Starr: Yes, please.

Dr. Donohoe: I think, why don't I talk about the environmental effects first and then I'll conclude with the health affects since, as a physician, that's more my area? I do do a lot of work in environmental health and have published in peer review journals on this and lectured across the country on this. It was initially thought that genetically modified crops would result in a decrease in overall pesticide use, whereas, in fact, that had occurred early on. In most cases the amount of

pesticide use per acre of cropland has actually gone up. And in the United States there are 300,000 people per year that are affected by pesticide poisoning. It's 25 billion worldwide. And the National Academy of Sciences of the U.S., which is the most prestigious scientific body in the U.S. has said that a million cancers will be caused in the current generation by the use of pesticides ever since that bill. It's not about pesticides. But it's important to understand that the use of genetically modified crops which were, in many cases, designed to decrease pesticide use have, in fact, done the opposite. So that's one environmental effect. The other is the development of super weeds. There's been 13 million acres in the U.S. that have been estimated to be affected by these so far which is the result of the genetically modified crops leading to evolution by natural selection of weeds which are resistant to certain pesticides and are therefore more difficult to control. There is concern about contamination events. And just between 1996 and 2008 there were at least 200 incidents of contamination involving 57 countries. And some of these that involved the U.S., such as the Starlink corn contamination in 2000 which lead to a $1 billion, billion with a B, worth of food recalls and a fine to Aventis of a half a billion would-be dollars. The ProdiGene event, when there was a GM crop that was contaminated -- it was modified with a pig virus that contaminated soybeans -- again, very expensive. We recently had an event of

contamination here with genetically modified wheat in Oregon that lead to a closing of the Japanese market, which is one of our primary export markets to Oregon wheat. There was also the Bayer CropScience LibertyLink contamination event which lead to anywhere from 750 to one and a quarter billion, with a B, dollars when Europe and Japan shut down their import of U.S. rice. So contamination events are, in reality and also potentially, for your state extraordinarily expensive and can affect not only the largest four farmers who are growing genetically modified crops but for those who are producing organic crops when there's fears of contamination. There are a number of studies looking at soil quality, effects on non-target organisms and other CBTs and a number of animal studies looking at the effects of genetically modified crops showing organ damage as well as some epidemiological or public health type studies where they found significant association between genetically modified crops and effects on human health. So I think that, certainly, the science is not complete in terms of the effects of human and environmental. Now there's still much that we have to learn. It's difficult to conduct prospective studies because much of the technology is proprietary and the companies are not eager to release the formulas that they use to genetically modify crops nor to release the seeds to independent investigators. So, at present, the way the crops are regulated is that the companies present their data to the government. The

government just looks over basically the conclusions. There's a lot that's certainly redactive in that. And then the government says okay or not okay. So there's really no opportunity for meta analyses which are looking at where the data was collected, i.e., by what investigators, what was their degree of independence from industry and as on. So if this was the standard that we applied to medical care, to some of the interventions like whether or not to do CAT scans on people or to use specific types of chemotherapy, medicine would be a very pseudo-scientific enterprise. And I think we have a much higher standard for how we treat medications and procedures that we perform on people than we have for regulating our food. And given that everybody eats food and not necessarily everybody goes to a doctor every year, I think it's important that, at the very least, that we, again, allow consumers the freedom to choose based on their own willingness of non-willingness to participate in what is essentially a large scale non-consented experiment, and that's the utilization of these crops. Again, I don't want it to be misunderstood and have people think that I'm anti-technology because the exact opposite is true. In fact, on any given night at the hospital I can tell you that I'm using, probably doing procedures, ordering tests and giving medications that cost insurers and others tens of thousands of dollars in any given night, all of which were developed using high technology methods, including genetics and including

genetic engineering. So this is not a technology issue. I think it's more a openness of the science, a freedom to choose. And fundamentally the precautionary principle comes into play here. And what that precautionary principle, which is the most important principle of public health, says is that when the scientific data are incomplete but suggestive of risk that there be democratic input into society's willingness to go along with such an experiment, that there be openness about the data, which is basically how science operates best, when there's openness, and that we proceed slowly the greater the risks are. So if it's something that's very low risk then we can proceed a little bit faster. But if the risks are even suggestive, that we at least proceed slowly with some democratic engagement and freedom for all people to become involved with the decision as to how to treat their own bodies and how to proceed nationally and internationally in terms of the intervention that's being carried out -- in this case, the modification of things that directly affect all of us because we all eat.

Chair Starr: Thank you.

Dr. Donohoe: So I'll stop there.

Chair Starr: Very good. Senator Bray has a question for you.

Dr. Donohoe: Senator Bray.

Senator Bray: All right, thank you for --

Dr. Donohoe: You're welcome.

Senator Bray:-- providing testimony. Can you hear me okay?

Dr. Donohoe: Yes.
Senator Bray: Great. So you were talking about the precautionary approach or cautionary principle. And I'm curious. This isn't a challenge. I don't know of any. Where have we applied that principle, the development of where we applied that principle successfully that you could refer us to so that we could use that for guidance in this situation?
Dr. Donohoe: Senator, that's a very good question. In fact -- can you hold just one second. I've got to just go move the van. It'll just take 15 seconds, okay?
Senator Bray: Oh, sure.
(Off-microphone conversation)
Chair Starr: Do you guys, over at the Agency, do you have fertilizer records, sales?
Male Participant: Pesticides.
Chair Starr: It would --
Male Participants: Herbicide .
Male Participant: Pesticide program.
Chair Starr: Well, herbicides, pesticides.
Male participant: But not fertilizers, no.
Dr. Donohoe: Okay, so this is a principle that's been endorsed by the American Public Health Association, first of all, which is the foremost group of Public Health Professionals in the United States. And we've applied this to things like disease outbreaks, environmental toxins climate change, even nuclear

weapons policy. It's been applied at the international level in terms of phasing out ozone-damaging chlorofluoro carbons through the Montreal Protocol , the European REACH Treaty which stands for Registration, Evaluation, Authorization or Restriction of Chemicals, the Cartagena Bio-Safety Protocol, the Treaty on Persistent Organic Pesticides.

And while it's not constitutionally enshrined in the U.S., it forms the basis of the Occupational and Safety and Health Act, the Endangered Species Act, the Clean Water Act, the Wilderness Act, the Food Quality and Protection Act of 1996. All of these including what the FDA does in its requirements for new drugs to be tested before they're marketed, all of this are illustrations of how the precautionary principle works in action and, again, I'm not sure if I mentioned Nuclear Weapons Policy too. So the simple way of thinking of the precautionary principle is analogous to the adage in medicine, "First do no harm." And so, again, the essentials of it are you give human and environmental health the benefit of the doubt because we're just one species with one planet and we want to make sure that if there's suggestion of major damage that we don't go too fast. The second is democratic public participation in the discussion. The third is to gather scientific as well as technological and even socio-economic information -- how will this affect us, not just at a scientific level but at the economic level. And then finally, it gets to the less risky alternatives rather than

moving quickly.
Senator Bray: Okay. So there's loads of examples. How did food get left out of this paradigm?
Dr. Donohoe: Well, that's a very good question. I think, in part, because certain elements of the regulation of food are covered by different entities because, as I mentioned earlier, in terms of genetically modified crops, you've really got this patchwork of regulation. I think, secondly, there's a tremendous power that's yielded by corporate Agri-business. For instance, the major companies spent well over $60 million lobbying Congress over the last decade. What's interesting, in addition to having a revolving door, in fact, I can refer the Committee if there is interest, to a slide that's on one of the lectures on my Web site that basically shows the link between just one company, Monsanto, and the federal government that has a side-by-side listing of who worked in which branch of regulation at the federal government and what job they held either before or after Monsanto.
So there's certainly a revolving door between industry and the regulatory bodies. That's not to say that it doesn't occur elsewhere, like at the FDA and the EPA and other places. But it tends to be fairly ubiquitous at the level of food regulation. And I think it's partly also the nature of regulation, in general, when it comes to food, is that there's a certain amount of trust that's given to those industries that create the food.

Things are put out there in the public domain and then the onus is upon researchers in the scientific community, then, to look back. And if they see something like an increase in allergies or an increase in any sort of illness, that they have to kind of go back and tease out, out of the myriad things that we're changing in the environment and in society over proceeding decades what might have contributed to that increase. And that's why it's hard to conduct excellent studies in the area of food safety, around GMOs, because mostly just, at least in humans, find association. So after, for instance, they introduced genetically modified soy to the United Kingdom, they found that over the subsequent decade there was a doubling of soy allergy in the United Kingdom. So was that due to genetically modified soybeans versus non-genetically modified soy? Or was that due to some other factor? Or was it a co-factor involved in quality of the air or quality of the soil? It's very hard to do. So why it's more in common in foods? That's a partial answer. But I think it mostly relates to this patchwork of oversight and to the tremendous power of agricultural bio-tech companies in the United States and their influence on governmental policies.

Senator Bray: Okay. Well, thank you. We thank you.

Vice Chair Zuckerman: Hi. This is David Zuckerman, Vice Chair. The Chair was just detained for a second. We may have to wrap up shortly because another group has the room.

Dr. Donohoe: Okay.

Vice Chair Zuckerman: I don't know if we'll be able to get you back because I know there's probably a couple other questions, this is relatively brief. around health issues and some other allegations that have been made by other witnesses. So maybe we'll try and schedule you again for a little bit more time, if possible. Sorry. You can take over.

Dr. Donohoe: Sure.

Chair Starr: That's fine. And do you have any publications or addresses to where we can get some of these studies that you quoted, Martin?

Dr. Donohoe: Yes, that's a great question. So the best sources for this are the Union of Concerned Scientists which was started by a group of about 50 (12:09:08) [PH] Biogen Nobel Laureates and has a page of their Web site that's dedicated to genetically modified crops with all the policy analyses, all of which cite the original studies.

Chair Starr: Yes?

Dr. Donohoe: So Union of Concerned Scientists is the first. You can also find information about this at the Center for Food Safety's Web site. Consumer's Union works on this. GMWatch is also an excellent group out of the United Kingdom. It, again, has on their Web site, links to all the major published studies. I have some open access slides shows and a few pieces that were published in the Lade Press surrounding this issue as well as links to groups that are working on genetically modified crops.

Because I have about 150 open access slide shows on my Web site ranging from 50 to 400 slides and I update them myself and I'm an unpaid sort of volunteer doing this, I don't have time to put all references in. But all the information came from those organizations. But if you want the original citations those other places are the places to go. If you want a general slideshow that you can show to colleagues and so on, feel free to steal, with appropriate citation, anything from my Web site, which is just publichealthandsocialjustice. org or phsj. org.

Chair Starr: Very good, Martin. Linda does have that information. And we certainly want to thank you very much for your time and thanks again.

Dr. Donohoe: My pleasure. I'm happy to help out again if I can. And I look forward to my next trip to your extremely beautiful and friendly state.

Chair Starr: Thank you.

Dr. Donohoe: And I'm not pandering. I really enjoyed the times that I spent there at Dartmouth and elsewhere, driving through when I was living in the Northeast.

Chair Starr: Thank you. Have a great day.

Dr. Donohoe: Not Dartmouth. That's your neighbor, sorry. University of Vermont, sorry.

Male Participant: Good catch.

Dr. Donohoe: That's what happens when you've get baby-on-the-brain. I've been up most of the night.

Chair Starr: Well, thank you.

Linda Waite-Simpson: Thank you.

Dr. Donohoe: Well, great. Take care.

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Female 2: At 4966? Is that the correct number? The one ending in 4966?

Rabbi: Right.

Female 2: Okay, we'll call you momentarily. We'll stop the Skype. Thank you. It's just not coming through clear.

Female 1: Thank you.

Rabbi: Hello, Rabbi Elihu here.

Female 1: Hi, Rabbi. I'm sorry about that. We're experimenting with technology and it wasn't quite working. So, we really appreciate your patience.

Rabbi: Okay.

Female 1: And if again, for the tape, if you could just identify yourself, we'd appreciate it.

Rabbi: Sure. This is Rabbi Elihu Gevirtz. I live in Los Angeles, California. I serve on a voluntary basis on an advisory council for an organization called Netiya, which encourages individuals and family, and churches and synagogues to grow their own food, and also professionally, I'm and ecologist and long ago, I was an organic farmer.

Female 1: Great. Thank you so much.

Rabbi: So, I'm familiar with agriculture.

Female 1: Well, we're the House of Agriculture committee.

Rabbi: Right.

Female 1: And a number of us are farmers and one of us is actually an organic vegetable farmer.

Rabbi: Great.
Female 1: And many of us have our own gardens here in Vermont. We tend to do that sort of thing.
Rabbi: That's fantastic.
Female 1: So, we're considering H. 112, which would require the labeling of food produced with genetic engineering and wanted your opinion about that in particular regards to -- we're talking about a state interest in religion and people's ability to source, if they do in fact shop in a supermarket being able to determine what foods contain genetic engineering and which ones don't and what importance, if any, that would have to your synagogue or the folks in your synagogue.
Rabbi: All right. I've read the bill, so I'm familiar with it to that extent. For observant use, the food labeling has long been a part of our practice. If you talk with any of your constituents who are observant to some degree, they might not necessarily be Orthodox Jews but even Conservative or Reformed Jews, they look for a label, it's called the hechsher, which identifies whether a food is kosher or not and also whether it has meat in it or whether it has a dairy product in it or whether it's neutral. So, the notion of food labeling is very important and it's familiar to Jews because we are commanded in the Bible that they are certain animals that you can eat and certain ones that you cannot eat. And you're not allowed to mix to having the same meal of meat with milk and so on. And so

food labeling is not a strange concept for us. So, that's number one. As far as how we view it theologically, what the Torah or the Bible or what you would call the Old Testament, what it says and in a number of places that has some relevant verses that I think are worthy of consideration. So, one of them is in Leviticus 19 where it says you shall not let your cattle mate with a different kind of animal and you shall not sow your field with two kinds of seed, and so on. And similarly in Deuteronomy chapter 22, it says you shall not sow your vineyard with a second kind of seed. And they're talking about like -- other rabbis understand that to mean, so if you have a vineyard, you can't plant wheat or barley in between the rows of vines and you can't plow your field with an ox and a donkey together, and so on. So, those are a couple of examples of where the Bible is telling us not to mix different species together. It doesn't say why, it just says don't. My thought on this as to why it says this is that, theologically, God created individual species and that work of creation is really God's work, and when we go so far as to mix an animal with a plant that that's really going into the realm of creation. It's really like it's going beyond our human role that we are tasked with and it's going into the kind of divine realm of playing with creation. It's not something that wouldn't happen in nature. I mean in nature as you know plants interbreed, animals interbreed, and it is part of the evolutionary process and that

happens naturally. But what's happening now is that genetic engineering is where animal genes are getting spliced in with plant genes. That then takes it to whole another level and I think that these verses in the Bible are telling us, don't do that. It's really that the work of creation is God's work. It's not human work. So, does that make some sense to you?

Female 1: Yes, yes. I'm wondering if you would be able to take questions from our committee.

Rabbi: Yeah, absolutely.

Female 1: I'm just going to ask my committee members to say their name before they ask the questions so you know who you're speaking to. Do you have a question, John?

John: Yeah, I have a couple of questions. John Bartholomew. First of all, you mentioned Leviticus and Deuteronomy. I think you said Leviticus 18 and did you say in Deuteronomy where it was?

Rabbi: It's Leviticus chapter 19, verse 19.

John: Leviticus 19:19.

Rabbi: Yes. And then the Deuteronomy verse that I cited is chapter 22, versus 9 through 11. And I have some other verses I'd like to share with you, too, but I think it be good to hear your questions and respond to the best I can.

John: Well, one question I have is from the perspective of Judaism, is this sort of an academic question or are rabbis and other Jews around the country and the world speaking out saying

just don't eat this stuff. I don't seem to be hearing from any religious groups the message going out to members and followers of the faith that these products should be avoided.

Rabbi: It's certainly being talked about. It's only being talked about in Jewish circle. I think perhaps one of the reasons why you're not hearing much about the conversation taking place is that I suspect that people are a bit confused that they don't really understand what's going on. I mean for example like I was asked to give a presentation to a group for our last election. It was a local group and there was like 30 people in the audience or so and there was a bunch of different valid initiatives to be reviewed. And I was asked to speak about the labeling of genetically modified organisms like the bill that you're considering. And people just don't really understand it. I gave examples of some of the things, some of the genetic engineering that's going on. For example, I said like they're putting scorpion genes in tomatoes and people are like, what? Yeah, well, apparently, the genes of the scorpion makes the skin really tough so the tomato can be shipped long distances without getting bruised. Well, a scorpion is not kosher. It's not a kosher animal and so that raises concerns for us. But I don't think the people understand that and I think that might explain why maybe you're not hearing this huge outcry. I think it's a difficult thing to grasp and to fathom, and it takes sitting down and doing some research on it. And

the other part, answer I think to your question is there is -- the tomato still looks like a tomato and the piece of cheese or the glass of milk still looks like the cheese or the milk so, it's confusing about what its status is. A tomato is a kosher thing to eat. A glass of milk is kosher to eat. Cheese is kosher to eat with certain limitations as long as there's no meat product in it. So, I think we're at a threshold time about awareness and about making a call about how to -- about looking at these types of food and like what do we call them. So, I think we're in a new part of our history and I think that's why perhaps that might explain some of this [0:13:45].

Female 1: Other questions? Okay. Other questions? Yes, Harvey.

Harvey: Yes, this is Harvey Smith. You mentioned as an example [0:14:11] I think it's probably genetic material from scorpions they put in tomatoes.

Rabbi: Yes.

Harvey: You have other examples of moving some kind of meat genes into food or vegetables or something?

Rabbi: Another one that I've heard of is -- I think it's, I'm not sure about this. I think it's eel, genes of eel getting put into ice cream. Yeah, I don't really understand it fully but that's another example that has something to do with making the ice cream more gelatinous, something like that. I don't know other examples but I may have heard about them, but I'm not

coming up with them at the moment, of the top off my head, but I think there are a number of examples like that where the characteristics of the animal are somehow beneficial to the product making it more marketable in some capacity. I understand that in the case of soybeans and perhaps in corn, I'm not sure about it, but that in the case of soy that the genes for the soybean are being -- that the genetic material for resistance to an herbicide is being put into the genetic material of the soy so that then the farmer can apply the herbicide to the field without killing the soy. And I understand that there's a case in front of the Supreme Court right now that have to do with that and a midwestern farmer. So, lots of examples of that. Corn, I think is there are similar things happening in that regard. So, one of my -- well, I have another concern about it but maybe I should just take the questions.

Female 1: Other questions for Rabbi? Okay, Will.

Will: Yeah, I'm Will Stevens. You've mentioned that observant Jews are already used to or familiar with labels, food labels, and I guess the question I have with regards to this bill is would labeling help -- I don't whether to ask for your opinion of whether it will help people or strictly observant Jews or confuse them with regards to what's in a food product if it was labeled that it maybe produced with genetic engineering.

Rabbi: Your question is would it confuse people?

Will: Would it help inform them in your opinion or would it serve to confuse them. You mentioned that people don't know what's going on and yet in the religious context there is a group of people who's used to looking for labels because those give them guidance.

Rabbi: So, the question as I understand you just asked would putting a label on it that says that it's GMO or it's possibly GMO, will that confuse the consumer? I think if I was the consumer and I was looking on a shelf and I didn't have the knowledge that I just shared with you, what I would probably do is go home and look up on the internet what does that mean. So, I don't think it would create confusion as it would create some interest to want to know more about what's in the food that I'm buying or I'm considering buying. So, in my view, I think it's a good thing to have more information and I don't think that it would be confusing. I think that it would just promote some questions like what does that mean, what's in it.

Will: Okay, thank you. Another question, this is Will Stevens again. You brought us something that I've been kind of working as we've been taking testimony on this bill and you mentioned that creation is God's work. For me, it kind of raises a kind of fundamental theological question. One is there are kind of two paths for mankind. One is to demonstrate our talents with no limits which would include genetic splicing perhaps and so forth and another is to say God is responsible for the creation.