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So I want to thank the National Plant Diagnostic Network (NPDN) itself for having us here this morning. There are several of our colleagues here from the U.S. Department of Agriculture, from the Animal and Plant Health Inspection Service, from the Agricultural Research Service, and last but not least the National Institute of Food Agriculture, as well.

So I want to ask my colleagues to stand up for a quick second. Please stand up. Thank you so much. USDA colleagues please stand up for a quick second. There you go that's a really good, excellent group of individuals, thank you so much.

So I want to you know share some thoughts about NPDN itself but I want to frame it in the context of the extent situation that we've got global situation that we've got as well and then kind of narrow down to very specifically the National Plant Diagnostic Network itself. I want to start with the Food and Agricultural Defense Initiative as we call it within NIFA which has three different components to it. And then I'll focus in very specifically into NPDN itself and the kinds of things that we're trying to do to provide the support that you need in the work that the critically important work that you do as well.

I see Robin Shepherd just walked in. He is one of our colleagues as well. He supports our colleagues in the extension world in the Midwest. Yesterday and (the) day before he and I and several others were at what's referred to the CARET meeting, C-A-R-E-T. And the CARET meeting stands for the Council of Agriculture Research Extension and Teaching. We were there and these are a bunch of really, really committed grassroots individuals. These are farmers, these are bankers, these are lawyers, and these are just average moms and pops that are absolutely, passionately committed to supporting food and agricultural systems. Particularly what we know in land grant universities as research extension and teaching itself.

So we're there and you know as is required of me in my position, I'm invited to share a few thoughts about what's going on in regards to where we are in the food and agricultural systems. I started off saying that what we do collectively is user-inspired science. It's not science that is done in a vacuum. It is inspired by the end users and oh by the way the outcomes of those endeavors transform lives. There's that connectivity between the inspirations that we get. You and I collectively in this enterprise from the end users, they might be farmers, they might be young people, you know from the 4-H world or whatever we're talking about. They're inspiring us and the work that we undertake. That we support actually ends up transforming lives as well.

A couple of days ago when I gave the speech of the C A R E T group I had an interesting example that I used which was what I heard on the radio on Saturday on a NPR show - national public radio show called Wait, Wait, Don't Tell Me. Maybe some of you listen to that show as well. Peter Sagal show and in that particular show and I'll come back to what you're up to what's of interest to you here in just a second. In this show one of the questions was about double dipping. You know double-dipping potato chips or tortilla chips. People have wondered - inquiring minds have wondered, is double-dipping good or bad? What turns out, there's a guy from Clemson University. Now I was on my way to go to this to a store, running some errands and I immediately pulled out my iPhone and pulled up information on Clemson University. Typed in double dipping chips and salsa and it pulled up the website for Paul Dawson. Paul

Dawson is a professor of nutrition of food and food science and nutrition at Clemson University and so they've done this research. It turns out its pretty dang gross. Many of your microbiologist and they looked at the numbers bacteria count basically in double dipped and single dipped and undipped and there's a pretty significant difference. Then they go on in the same article with the five-second rule right and in fact you know that five second rule work has even been recognized with an Ig Nobel Prize. Well it turns out according to Paul Dawson and his colleagues is the five second rule really should be 0 second rule and they actually looked at various surfaces including carpeting like this and looked at the hardwood floors and tiles and mosaics and so on ceramic tiles and things like that. Turns out really should be 0 second rule again, they looked at the microbial count.

Then they looked at you know cakes, birthday cakes and we put a bunch of candles on them and you know as are thing to do here in America and around the world you sing happy birthday in it you know you blow on the those candles and turns out it's like the worst thing to do. The microbial count just went off the scale. So then I mean really seriously it's funny but the interesting thing is this work that they did was inspired by people asking these questions, particularly children asking these questions and they undertook the work, and now you know you're not going to probably do candles on your cake and you're not going to double dip, are you, and you are not going to do the five-second rule.

I know that when our when our daughter was very little she would drop her pacifier we pick it up and suck on it and then we would stick it back in her mouth. Okay, thinking that's the way to do it, right? But now you know. So your lives are being transformed by this amazing work that this Paul Dawson guy did.

A second example I want to share with you. How many of you know Barbara Valent from K-State? Barbara Valent is a well-known plant pathologist and we gave her a grant for about six and a half million dollars out of our AFRI funding, the Agricultural Food Research Initiative funding. Just the day before yesterday we had a press alert called EurekAlert! that came out she works and she is well known in the plant pathology world for her seminal work on Magnaporthe grisea the rice blast and she's also been looking at blast and its impact on wheat production in the Midwest and in the United States as well. This article goes on to talk about the really fantastic work that they have done and turns out that they discovered, when I say they it was not Barbara but probably people like yourselves discovered in Kentucky on wheat, a blast, and Marty Draper sitting right here, is nodding his head he knows about it because he was probably involved in helping provide the funding and all that for that particular project, and found that blast it is a pathogen that is native to the United States, and occurs on turf grass but interestingly it has the very similar genetic makeup as the blast that's devastating crops in Bolivia and in South America in other parts of South America as well.

So the concern is blast is considered to be a devastating pathogen that's likely to destroy our wheat crop and other crops as well for that matter and that people like yourself were involved in actually discovering it very quickly was dealt with and went on to take care of it. It was he only occurrence of that blast in that situation in Kentucky in wheat and the point of my sharing this story with you is again that there are folks out and about like yourselves and we've got this network across the United States of America the National Plant Diagnostic Network and then your counterpart the animal counterpart at

the Animal Health Laboratory Network as well and these two networks are truly our nation's you know involved in you know work and as our nation sentinels and sentinels not just from the inquest natural occurrence or the occurrence of invasive species or god forbid the intentional introduction of some of these pathogens and insects and weeds and things like that too and so you are between the natural or intentional or accidental introduction of pathogens and insects and all that and our very critically important food systems in this country and so I want to sort of stop there about this user inspired science that's transforming live and switch gears a little bit and tell you that and I'm sure some of you have thought about this, we have an existential threat, this existential threat is nutritional security.

I like to frame it as nutritional security I used to also like many people around the world you know think of only food security and that it was all about making available calories but several years ago start thinking that it's not just about calories and in fact it's the excessive amount of calories is why we have a situation in America and other parts of the world with obesity and other devastating diseases, cardiovascular diseases as well but we need to be mindful of it and start thinking of the fact that we've got to have health outcomes as well, nutrition and health outcomes as well. At the end of it, the calories that we consume must result in something positive and so I frame it as nutritional security and it is an existential threat you know we all talk about oh you know year 2050 blah blah blah nine billion people blah blah blah you know we added an item we talk about these things but this is happening right now, not something that's going to happen in another 30 years or so, it's happening right now, in our lifetime right now, not in our children our grandchildren's lifetimes and the reason I say so is we have a situation today, globally of about a tad bit shy of 1 billion people about 850 million people that's going to go to bed hungry tonight, globally and in the united states where we know how to produce food and literally feed the world we've got just about seventeen percent, pardon me, 17 million households in America that are food insecure tonight.

That's about 45 million people in the United States of America we know how to grow food we know how to make this available to the entire world and yet we've got people that are going hungry tonight and then the flip side of it, sort of the yin and yang situation, is that we've got tonight, globally we'll have about 1.3 billion people that will go to bed tonight before they go to bed they're going to take Lipitor for cholesterol high cholesterol they're going to take baby aspirin for heart disease they're going to take medication for hypertension they're going to take medication for like metformin for type 2 diabetes on and on and on so we've got this yin and yang situation.

This group taking all this medication is because of the excessive amount of calories being consumed and this group dying because of lack of food and in both situations we've got, ultimately its death that's going to take place and that's the situation that we've got in fact even in America one out of six adults ends up having to take these medications to deal with the situation that we've got, because of the excessive amount of calories that's being consumed and you know low quality calories for lack of a better term in fact Ursula Bauer with the Centers for Disease Control in a really outstanding study she published in 2013 says to us that America's health-care costs look at the entire health care costs in fact that's like the biggest fastest growing part of our economy as you know although you know the Affordable Care Act has really taken that curve and scrunched it down significantly, she says that

seventy-five percent of that health care costs are attributable to chronic disease such as heart disease, cardiovascular disease, hypertension etc. and she also says that this chronic disease is completely preventable and she says that it's the result of three things food or the you know quality and quantity of food, the behaviors, and lifestyles.

In fact she says you can be a total couch potato and just reduce the number of calories you're consuming and improve the quality of those calories as well and you can get better outcomes, health outcomes as a result of that and again that goes back to this existential threat that we've got right now and one last point about this existential threat that we have is you know starting in the late eighteen hundreds in America every generation has lived a little bit longer than the preceding generation to the extent where today men and women in America live to about 80 years of age men live a little bit of a little shorter than do women but approximately about 80 years of age and for the very first time children born in the first decade of this century those children will have a shorter lifespan than their parents and the reason for it is simply is the excessive amount of calories being consumed. Children having, these are eight and ten year old children having hypertension. It's an old person's disease! Children having cardiovascular disease again it's the calories being consumed and we all say oh yeah it's also the inactivity and all that of course those are as well but if you look at the data it suggests that activity in and of itself is not sufficient, it is literally the number of calories we consume and the quality of those calories as well that's the this sort of an existential threat.

So that's one part of it, the second part, how much time do I have? Ok, the second part of it, I do have a you know I gotta go yeah I gotta run to another meeting here in just a little bit in the district and so traffic is going to be a problem for me as well, so another component that is along with this existential threat that we've got I like to think of is the perfect storm that we have. And what do I mean by this perfect storm? You know imagine in your mind's eye Katrina and that eye you know that we saw of the hurricane itself that came through and this perfect storm is a whole series of things that are happening it is the population, it is the changing incomes, and diets that are contributing to you know and people in China and India and other places because of increasing wealth they're consuming more and more food they want more meat they want more fruit and vegetables and things like that so the pressures on our ability to produce food increases there is diminishing land and water resources there's environmental degradation all of these, oh by the way you combine with all of that also this anti-science, anti-intellectual environment we have particularly in America a land blessed with the most amazing educational systems, blessed with the most incredible media that we can utilize, and yet we have a situation where we have this anti-science, anti-intellectual environment as well and there are various types of individuals you know, on the left and right you've got individuals that are pushing this anti science, anti-intellectual environment creating this environment in the United States, you've got the food babe Hari Vani or Vani Hari, I should say.

She has a degree in computer science and she has about a hundred thousand Twitter followers and she says that GMOs are terrible you shouldn't eat it so mom's you know are following her and say oh my gosh you know GMOs are terrible never mind there's no science that says GMOs are bad but people follow Vani Hari the food babe and you've got Bettina Siegel, the pink slime lady, remember a few years

ago this is you know craziness about pink slime and then we have the Alar story as well that was on 60 minutes for example and then you've got Jenny McCarthy the anti-vaccine lady, never mind that we got to have vaccines, they've been shown to have a positive impact, the herd effect as they call it and there's zero data to say that vaccines cause autism and the one paper that was published had to be retracted because the fellow you know that published that paper had faked some of the data it was one of the promoters that he had used allegedly that was contributing to this situation had to retract that paper as well and then on the right you've got to Rush Limbaugh.

And Rush Limbaugh is a climate change denier and there's many many others as well I mean we had one of the presidential candidates remember was saying that God asked people to build these pyramids in Africa and Egypt to store grain you know and we've got individuals running for office that deny various types of things and again they don't want to be nailed down about scientific fact as well so Rush Limbaugh said a few years ago that the four corners of deceit that are foisting deceit on everybody are academia, scientists, the government, and media are the four corners of deceit and that's the environment that we've got that's also part of this perfect storm.

That's the situation you got the existential threat, you've got the perfect storm so now you and I collectively as scientists you know we can't say oh my gosh what are we going to do about this? You know if you're a scientist if you're a farmer you've got to be an optimist, you can't be a pessimist about these sorts of things and I know there's, and you'd agree with me, there's a path forward and this path forward includes the need for us to discover new knowledge you know all the knowledge that's being gained today in the world of all the omics and all the big data stuff and you know smart systems and ecology and soil health and on and on that's all part of these new discoveries that we need that's the pathway that we've got along with that to take that knowledge and translate that into innovations and solutions and to deliver to the end users through what we call as extension in this country and along with that you know new farming systems and new ways of educating young people and communications and things like that all of that is part of this path forward. And one of those paths forward is what we like to refer to within NIFA as the tactical sciences that we need, and these tactical sciences that we need, include everything from the diagnostics that we have, to integrated pest management, to the kind of work that folks in the IR-4 world do developing tools for problems right now these are tactics that we need to be developing this is not some long-term thing that's going on but something that we need right now we therefore refer this as tactical sciences and so the National Plan Diagnostic Network and the National Animal Health Laboratory Network and oh by the way the third component of the Food and Agriculture Defense Initiative for those of you that don't know is EDEN the Extension Disaster Education Network.

And so these are we believe are critically needed, today, and demonstrably NPDN and now with you know previously about few years ago back about 10-15 years ago we had West Nile virus that came in remember that and again a mosquito-borne disease and our National Animal Health Laboratory Network was very critical in making sure that we were able to figure out where this disease was spreading, how was it spreading the, involvement of mosquitoes and things like that as vectors that was the kind of work that was done in the case of West Nile virus, today the conversation's switched over to

the Zika virus and there is unbelievable angst and just yesterday in the Washington Post there's an article that talked about how you know here we are going crazy about Zika virus and the Washington Post says that in the united states we've basically eliminated that network that we had of these university-based and community-based, county-based you know health departments that have folks that are actually going and monitoring for mosquitoes and things like that and you know the State Department of Agriculture used to have this incredible cadre of individuals that were involved in these things, they were doing the surveillances, all that's been wiped out and you know we had these mosquito abatement districts particularly along in the southeastern part of the United States and up along the Atlantic seaboard that were at their not only monitoring working with the county and the folks and the land-grant university folks, but actually going in and deploying tools, tactical tools to deal with the mosquitoes as well and we dealt with these things but we have over the last many years with increasing population with increasing encroachment into lands that would ordinarily be left as either as natural areas or agricultural areas is increasing encroachment and you have a situation where because of that we're coming in contact with areas where we ordinarily wouldn't have like you know down in the Everglades and other places or down in Louisiana and Mississippi in places where there's encroachment taking place so there's increasing contact with reservoirs and increasing contact with various types of arthropods and other things that are carrying these critters and increasing you know travel and globalization as well all of this is happening at the same time we've reduced our budget and eliminated these cadres of individuals that we need and if you look at the National Plant Diagnostic Network very specifically you know thanks to the American Phytoplast Society, they were one of the first ones to think way ahead of the 9/11 tragedy that we had to create the sort of a network and within our agency Kitty Cardwell is one of the individuals that was involved in working with folks around the country that started thinking way ahead and 9/11 happens of course in all of this network is now completely created significant investments were made between the animal and plant health inspection service and NIFA back in those days it was called CSREES and the network was created, people were hired, equipment was created you know investments were made for equipment for the network itself diagnostics, digital diagnostics and things like that things were great.

And then 9/11 you know slowly fades from our memories because it's a few years later and we have budget cuts at the state level budget cuts at the federal level and suddenly that network that was created you know starts fraying to the extent that just within NIFA's portfolio for the FADI for the Food and Agricultural Defense Initiative the budget dropped it started out well above 20 million dollars drops to below about five million dollars about four and a half million dollars is where it lands, and this to protect a farm gate just looking at the farm gate value, farm gate value of about 380 billion dollars but if you really look at the food that comes to our dinner table that entire food system the economic research service says that it's about a trillion and a half to two trillion dollars and so were investing a measly amount of about four and a half million dollars to protect a 2 trillion dollar enterprise and then you throw in the public health needs and all that that the National Animal Health Laboratory Network is critically necessary for you know health is the biggest part of our GDP and were investing a very small sum of money and we've tried for the last several years and we you know connect with our AFIS colleagues and commiserate about how we go about doing these sorts of investments in the context of

the continuing budget pressures we've got, we've been asking for more funding for this enterprise every year at least since I've been there and for the you know so we got a little bit of an increase, and a little bit of an increase to where it's about six and a 6.7 million dollars this year in 2016 and luckily our insistence at seeking the additional funding finally was heard, and in the President's budget we have a request for 10 million dollars for the Food and Agricultural Defense Initiative.

My own vision is that we need to get it back up to around you know around 30 million dollars or so to ensure that we're protecting the interests of this two trillion dollar enterprise that we've got overall and but this is headed in the right direction and we have our hearings next week so last week no two weeks ago we had our meetings with the Senate staffers they're deeply interested in this and they would like to do everything they can to support this increase that we've asked for FADI as well as overall as some of you have seen you know we've asked for the our Agriculture and Food Research Initiative we've asked to double it basically to 700 million dollars and so we hope that Congress buys into that next week is our hearing on the Hill and I hope that there will be some questions that will be asked of me about the importance of FADI and hint hint, you might want to plant those questions so I hope I'm going to be asked the question and I hope to be able to make a compelling argument for why it is that we need this this network called the National Plant Diagnostic Network and the National Animal Health Laboratory network and EDEN itself in fact I was asked a question, one question asked by the folks in the Senate where will I put those dollars the increase by about 3 million dollars and change.

I said our intent is to put it exclusively on NPDN and NAHLN so it's not going to divided up three ways to go to EDEN then NPDN and NAHLN our intent is to invest it very exclusively on National Plant Diagnostic Network and the Animal Health Laboratory Network okay so I want to wrap up here and ask you to speak to this incredible enterprise you know Jim stack I don't know if Jim stack is around in the audience or not he's a buddy of mine from many years ago and he is there some place, is he hiding? Are you hiding out there? Geez man ok he came to me, he's come and you know met with me every year for the last few years trying to make a compelling argument about needing more money and all that and I said I'm already bought into it so he doesn't need to make that argument to me but really it's the public at large that needs to know about it this is a very well-kept secret and in fact you know he told me I can tell you some things and if i were to tell you he'll have to kill me you know about the kinds of things that NPDN is doing and seriously it is a well-kept secret and you and I have to do everything we can to let the public know about it. Do articles in your local paper, do uh you know op-ed pieces, get on the radio and be interviewed about it, and do television pieces, do blogs, tweet some of you do i know that, you know post on Facebook, post on Instagram, and things like that and unless we get the sort of a mass movement of people wanting to support NPDN and not just NPDN but in general the food and agricultural systems itself we're not going to be successful because there's a lot of noise as well as you know and in this environment we're going to have to do everything we can to make sure that we get the kind of resources that we need as well that I want to thank you very much and right on time.