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Good morning, ladies and gentlemen, and thank you very much for that introduction. And I should say I'm very grateful for you for rearranging your schedule to meet my schedule. And I'm very pleased here to be in Des Moines to talk on this particular issue.

Before I get going, I must stress that the conclusions of the various research that I'll be presenting here this morning come from my work and should no way be interpreted as reflecting the policy standpoint or recommendations of either RAND or any of the sponsors of this research. I must get that thing in right away. Otherwise, I won't be having a job to go back to.

Agroterrorism – I guess it's a new term. And certainly about three days ago or even eighteen months ago, to think that agriculture, biowarfare, terrorism, security would be lumped together in the same sentence was not on anyone's radar screen. Suddenly we are beginning to... Well, we're living in a new era now. The attacks of September 11th have undoubtedly shaken our confidence in what we can and cannot expect from those who want to subvert the stability not only of the United States but of any country in the free world. Agroterrorism is one of these novel types of asymmetric warfare that is now being emphasized as possibly playing into this increased and expanded ___ of terrorist aggression.

Now, I'm not an agricultural specialist, and I certainly don't want to mislead you in thinking that I am. All of my work has been based on straight terrorism. When I first came to RAND, there was a lot of emphasis that we were doing at that stage looking at weapons of mass destruction, terrorism, specifically the use of biological agents, to afflict mass casualties against human populations. One thing we wanted to look at was whether or not many of the obstacles inherent in actually recognizing and developing human pathogenic agents still applied if the emphasis was shifted to agriculture, was shifted to livestock and animals. And that's how I became involved in this particular topic.

And what I want to do today, I want to take you through various aspects and components of what we see as a threat and vulnerability of agroterrorism. I want to look at the vulnerability of agriculture. I then want to look at the ease by which that vulnerability can be exploited; thirdly, the risks potential to the perpetrator of actually exploiting that vulnerability; and finally, the payoff in terms of what an extremist, what a terrorist, even what a criminal may expect to achieve by actually engaging in a deliberate introduction of a pathogen organism against agriculture.

Firstly, I guess the first point I want to make is that, since the Oklahoma bombing, considerable investments have been made in infrastructure protection in the United States. We have come ___ a public infrastructure that is now increasingly well-protected, and it covers the gamut from both conventional weapons right through to the more exotic mass destruction chemical and biological attacks.

Agriculture, however, is one area that stands a glaring exception to this particular focus that is being placed on infrastructure protection within the United States. And right away I want to say one thing: That is an oddity when we look at the economic worth and importance of agriculture to the United States. And I've just put up a couple of figures here to give you an indication. It's the largest employer in the United States, and we're not just talking about those directly employed in agriculture-related activities but also all the nonfarm industries that are affected by agriculture, which can rank from anything from refrigeration and transportation right through to the fast food chain. And it's also one of

the leading exporters for the United States in terms of the revenue that's generated from cash receipts for commodities sold overseas.

These figures, as significant as they are, only really represent a tiny fraction of the true worth of agriculture because they don't take into account the related and indirectly related industries that are dependent upon agriculture. And if we had a large-scale agriculture disaster occurring in this country, the effect would, therefore, not be specifically felt only on agriculture. It would set off a tidal economic wave effect, if you like, that would impact distribution services, that would impact on the food industry, and ultimately would impact on the individual, you and me, on a very personal basis. So we're not talking about a side issue here. We're talking about an industry that effuses the very way in which America sees itself. It is a critical sector, and it is one that is worthy of protection, simply for that factor.

What makes it even more incongruous that agriculture is being excepted from the focus on public infrastructure protection is that it is a vulnerable sector for a number of factors. Firstly, the way farming has grown up in the United States today, it is incredibly intensive, it is incredibly concentrated. Most dairies can be expected to have at least five to ten thousand animals. Many of the larger facilities would have many more animals, fifty, sixty thousand animals. They're kept very closely together. They are transported very closely together. The point being, they are confined in an artificial space that human beings are not. So if you've got an infectious outbreak occurring within one of these communities, chances are it's going to spread incredibly quickly. And it will spread beyond the geographic area very quickly simply because of the way in which animals are transported, not only interstate but between states as well. So the first factor is that, well, if you do get an animal disease outbreak, it's likely to spread.

Secondly, there's a lack of biosecurity and biosurveillance on farms, generally because – it's certainly in terms of the deliberate introduction of a disease agent – just as a product of the fact that it's simply not something that most people have actually given much thought to over the years. Barn sales, feed lots, biosecurity of food processes within distribution services – all these areas tend to lack effective biosecurity and surveillance. We have what many have referred to as an inefficient disease-reporting system, and here this seems to reflect a general lack of trust between regulators and producers. In many cases farmers or producers are reluctant to quickly report an unusual disease occurrence that may have taken place on their farms, simply they are concerned what the ramifications of this will be in terms of inviting regulators in. They might close the farm down. Even if they don't close the farm down, the image of a regulator coming in to a farm may send a message to the wider community that that particular farm is unsafe.

So the tendency is to delay, which obviously mitigates between the rapid and effective containment of the disease should it be _____. And the reason why we have this lack of mistrust, I think, is largely because compensation is done on an ad hoc and sporadic basis within the United States. We don't have a standardized compensation system that can be brought into play, and if we did, perhaps the level of confidence between regulators and producers may be increased.

Veterinarian training has also tended not to emphasize foreign animal diseases. I guess that's inevitable. It tends to focus upon diseases that are inherent within the United States. And as a result – we see this in many respects the same effects occurring with health department officials dealing with human infections – that we have a lack of sufficiently qualified veterinarians, not only at the local level but at the state level and at the federal level that lack the ability to quickly and accurately recognize foreign animal diseases and to treat them.

And there's also the tendency within veterinarian training to focus on small animals, domestic pets, if you like – I guess that's where the market is – as opposed to large-scale husbandry. So the

combined effect has been to mitigate against the effective treatment of large-scale husbandry, which is the type of livestock that is most likely to be targeted when we're talking about animal diseases.

And the final point about prevailing statistics providing a focus on aggregate statistics, here again, because we do this or because there is a tendency to focus on the overall picture again mitigates against the early recognition of a problem when it may become apparent. Sometimes producers may only be aware of something when overall milk yields begin to fall. And if we're talking about the need to actually get in place effective containment measures immediately, we need to have a system and have a general mechanism that is in place that provides for that rapid reporting of any problems that may be inherent.

So there are a number of factors that underscore the nature of farmers that suggest vulnerabilities. But these aren't the big ones.

When we go on to the agricultural dimension, a number of other factors become apparent which further exacerbate the vulnerability. Firstly, there is a multiplicity of agents that are both lethal and highly contagious. We know of at least 22 foreign animal diseases that would be devastating to the United States, and that's far more than the human pathogens that the Centers for Disease Control have identified as posing a threat to human beings. Moreover, many of these diseases are environmentally hardy; they can exist for long periods of time, both in organic matter and beyond organic matter. And many of these diseases, because they are foreign animal diseases, livestock, are not routinely vaccinated against. So you've got a problem with the type of agents that are available.

Secondly, it has been suggested that livestock itself has become a bit more disease-prone as a result of steroid changes and husbandry changes that have been introduced to increase the volume, quality and quantity of meat production or to meet the requirements of specific vendors. Argument here is that these types of artificial treatments have elevated the stress that is being imposed on animals and in so doing has undermined their natural tolerance and resistance to diseases, particularly given particularly these very contagious and virulent diseases that exist on the high end of the spectrum.

Diseases can quickly spread. I'm sure you've been following the anthrax cases that have occurred over the last few days. One factor that is being consistently stressed by health officials is that it is very, very difficult to develop anthrax in such a way that it can be aerosolized to ensure a large-scale outbreak. This really doesn't apply with the agricultural dimension, for two reasons:

Firstly, many of the diseases are highly contagious in and of themselves. Foot and mouth disease, which the UK has recently been grappling with, is one of the most contagious diseases known to medical science – highly contagious. If you add that to the fact that the nature of farming is intensive and concentrated, the animals themselves become the mechanism and the institution by which diseases can spread. So if you do get the introduction of one of these diseases, the likelihood is that you will get a large-scale epidemic, which is one of the obstacles that is often emphasized in terms of why you wouldn't get a large-scale human epidemic, because it's difficult to actually (a) get the right disease and (b) ensure that it can spread amongst a large community of a wide area. But that doesn't really hold true with agriculture.

You also have foodborne attacks, and here I'm taking a wider spectrum of the agroterrorism debate. Here what we're talking about is the introduction of a contaminant directly into the food chain. A lot of the food processes within the United States are at the small- or medium-scale level. We have thousands of these facilities scattered throughout the country. Many do not have very effective biosecurity or surveillance, many do not conduct any checks on seasonal employees that come in and out

of the facilities, there is very little restriction of movement onto or off these sites. The point being is that they themselves pose fairly vulnerable and open sites if you wanted to introduce a pathogen or a heavy metal or some other contaminant into the food chain and then to initiate an attack – and in this case would not only be an economic weapon, it would also be a human weapon because you're likely to get human sicknesses as a result of the foodborne epidemic. And we should realize that, up until the anthrax cases, the one case of bioterrorism that the United States had faced was the 1984 poisoning of salad bars in Oregon by the Raznishi cult.

So what I've said up to this point, to recap, we have a highly critical sector that is vulnerable, and it's not that difficult to exploit that vulnerability. So we've got two aspects of our threat vulnerability assessment in place. The third is to look at: What is the risk to the perpetrator of doing this? And again a theme that is commonly emphasized in terms of bioterrorism is that there are sufficient detractors that would prevent most groups from going down the unconventional level. And these are typically framed in the form of threat of mass reprisals from states, the fear that by engaging in an act of bioterrorism, you're going to undermine your political support base because these weapons are seen as so evil that they could never be justified. And another factor is that, if you're dealing with agents that are designed to kill human beings, you've got to know what you're doing; otherwise, you'll kill yourself in the process of making these agents. So there's always a risk of latent or accidental infection.

Let's take a look at agriculture. Well, if you kill a lot of cows, you're unlikely to get the same sort of state reprisals and counter-reaction as you would if you killed a lot of human beings. That's reality. So the risk of unfettered state reprisal is much less. And the same thing flows into political support. It has even been suggested that if a group actually specifically targets livestock as opposed to human beings, their aggression may almost be seen as benign because you're specifically going away from the human dimension – you're going to agriculture. So the perceived risk in terms of undermining your political support base would be lower.

Thirdly, what about the risk to the perpetrators themselves? Well, if you use nonzootic diseases, i.e., those that cannot go from animals to humans, there's going to be no risk of latent or accidental infection. So you can handle these diseases very well. And again, what we are now getting, we have a vulnerable agricultural sector. Those vulnerabilities can be exploited, and they are within the capabilities of many groups, and there's conceivably little or no risk of actually doing that. So we are now setting up a fairly significant threat vulnerability assessment.

But none of this would make any sense, and would all be meaningless, if there was no point in actually targeting agriculture. Why would a terrorist bother. I mean, terrorists are concerned with theater; they are concerned with image. No one will forget the images of those two planes crashing into the World Trade Center. It is an in-your-face statement. They seek to shock. So it's argued, "Well, none of that applies to agriculture. You're not going to get that public statement. You're not going to get that in-your-face message. There would be no point in attacking agriculture, for that reason."

Well, on the basis of pure theater, if you can call it that, that would be true. But terrorism is not just confined to that level. Many groups have undertaken secondary campaigns of so-called infrastructure terrorism in order to undermine the economic well-being of their primary target. Provisional IRA, prior to its cease-fire in the UK – most of its English campaign was focused specifically on bringing London to the negotiating table by targeting the financial heart of London. It was a form of economic infrastructure terrorism. If we take that sort of reckoning and look at agriculture, the same thing would apply. And I'll go on to look at the economic dimensions of that. But it's more than just economics, because the way in which an agriculture disaster would unfold are likely to have social and political ramifications and may even have the possibility to set up mass panic as well.

Firstly I'll deal with the economics. The biggest, undoubtedly, impact of an agriculture disaster would be economic destabilization. We're going to get at least three types of economic costs. Firstly, you're going to get the direct cost of containment and eradication. And those costs can be enormous, and it really depends on the type of agent you're dealing with. The study here that has been conducted in the 1980s tried to estimate the eradication containment costs of African swine fever in the U.S. Another five years it was put at that stage, and it ran about \$5.4 billion. But that's only in containment and eradication.

If you take into account the indirect multiplier of costs that would also result, the true cost becomes far greater. Here you've got costs that may be imposed as a result of compensation paid to farmers and producers suffering from widespread losses as well as losses accruing to industries that are either directly or indirectly related to the agriculture sector in question. And the best example here is the UK and their recent experience. Compensation alone to farmers has so far exceeded one billion UK pounds. On average, 116,000 pounds has been paid out to individual farmers for compensation. That has also set off a ripple chain effect. You've now got tourist industries asking for compensation as a result of the loss of bookings brought about by foot and mouth. You've got restaurants and other services that are asking for compensation. And if you take the tourism industry itself, we also get the feel for the indirect ramifications of an agricultural disaster. The tourism industry in the UK this summer suffered enormously as a result of the quarantine of farms that were located in or very near popular tourist destinations such as the Lake District. Rambling trails were closed, and sales receipts were down by as much as 70% in some areas. So you've got the indirect multiplier costs also resulting.

But perhaps the more significant are your long-term international costs mostly resulting from the imposition of trade embargoes, protective trade embargoes, by major trading states. In 1997 in Taiwan they suffered a huge outbreak of foot and mouth disease, and it had an enormous effect on Taipei's gross domestic product, as a result of the curtailment or the banning of Taiwanese agricultural exports that were affected by that outbreak. Taiwan is still suffering from that today. The recent outbreak in Argentina of foot and mouth disease this year is going to cost millions in the loss of export commodities and only in export commodities. And until the international community is fully confident that the outbreak has been fully contained and eradicated, those trade embargoes and those restrictions are going to have long-term effects on the continuing economic and fiscal viability of the state in question.

So firstly, at the most fundamental level, if you had a large-scale agricultural outbreak, you will get mass economic dislocation.

But as I said, we can't limit the effects to that dimension. And when I get onto these other areas, perhaps now we're getting into the types of motivations that we more traditionally associate with terrorists.

The first would be loss of confidence in government. If we had a major disease outbreak amongst cattle or in the food supply or in the food chain, people would certainly lose confidence in the safety of the food supply. They would also start to ask, "Well, why did the intelligence services not know that an attack was imminent? Why was agriculture left exposed? Why don't we have sufficient preparedness measures in place?" All of which combine to set off a chain reaction that leads to a significant undermining of the public's confidence in the ability of the state to fulfill one of its primary functions, namely, to ensure for the safety and welfare of its citizens. In some places it's even been suggested that the public may start to equate an increased ability to infect livestock with an increased ability to affect human beings. And so there may be questions raised about the effectiveness of weapons in mass destruction preparedness in general, all of which could unleash a chain of reactions that fundamentally alters the critical relationship between the citizen and the state and the government.

But it's not just at that level. Even once a disaster has occurred, we may well see criticism directed against the types of measures that governments seek to institute to try and control the outbreak, and again, here I go back to the example of the UK. Britain has already lived through a catastrophe in the name of mad cow disease. There would have been a lot of vested interest to ensure that another type of agriculture outbreak did not have as significant results. The government went in and concluded that the best way of containing this disease as quickly and as effectively as possible was through mass culling. They initiated several firebreaker operations, and they slaughtered hundreds, hundreds of thousands of animals. They didn't just slaughter sickened animals; they slaughtered those that were susceptible and those that were likely to come down with the disease in the future.

People, the public, started looking at these images of carcasses upon carcasses upon carcasses. An uproar was sparked off, particularly when the public realized that healthy animals were being killed and particularly when they realized that foot and mouth itself didn't actually kill the animal in question. There was enormous criticism directed against the government, even though at the time it was seen that mass culling was probably the most effective and efficient way of dealing with the disease as it then occurred, because there hadn't been any large-scale vaccination program in place. Think of those effects if they occurred in the United States. You must remember here that we haven't had a large-scale animal disease outbreak in the era of public television. So there has been no visual point of reference available to the public to prepare themselves for the consequences of the types of containment measures that would be necessary to contain that. And I'm sure that the type of criticism that we saw in the United Kingdom would be equally if not greater because of that in the U.S.

Then what do you do with all these carcasses? You've got to dispose of them. Mass carcass disposal creates problems, and it may well generate a lot of environmental questions against the government. Animal rights groups and environmental groups may take this an opportunity to carry out their own acts of violence against the government. So what I'm saying is that there are a lot of underlying social and political ramifications that could naturally flow from the initial disease outbreak, all of which would impact again on the public's confidence and support for government, which again is a fundamental objective of terrorism, when we go right back to the textbooks.

Social instability: Here I'm talking about the possibility of a disease outbreak actually engendering mass panic. And up to this stage we haven't really been going down that route. But if a disease outbreak actually did have the ability to jump from animals to humans, you're likely to get a mass panic. Certainly we saw indications of that in Malaysia with the nipa virus that actually killed 108 Malaysian farmers. It led to the wholesale desertification of large areas in southern Malaysia of farms as people were fleeing to get away from the affected areas. W___ virus outbreak in New York also provides at least a slight indication of the types of social dynamics that could be instituted if a zoonotic disease were ever to become entrenched within the United States and if that disease did lead to large-scale or even moderate-scale loss of life or infections.

I've put "Criminal Enterprise" there because one other aspect that some commentators have emphasized is that, if you are a wily investor, you could actually make appropriate investments on the commodities future market before carrying out your attack, to cash in on your elevated dividends as the affected states shares fall. And if you had done that prior, if you had investment appropriate prior, say, to the foot and mouth disease outbreak in the UK, you could have made a lot of money. So there has been the suggestion that it could be a novel form of criminal enterprise.

While we haven't had, as far as we know, any agro attacks, I'll just put a couple of examples there. There was a case in Kenya which involved the use of African bush milk to infect steer, which was part of the Mau Mau campaign. In Shalanka, Tamul militants threatened to unleash or to carry out

poisonings and contamination of tea and coffee plantations as part of a total economic war against the Colombo government. But we really, when it boils down to it, there haven't been that many cases. And so the obvious question is, well, why? Why haven't we had any attacks, particularly given the fact that we have a vulnerable sector that can be exploited, there's little risk of doing so, and the payoff can be enormous? Well, who knows, but I've just put a couple of suggestions.

Maybe terrorists haven't thought about it. I mean, traditionally, terrorists have been concerned with human aggression, the gun and the bomb. Here the implication is that, as terrorists become more adaptable, more innovative, they may seek to supplement their traditional tactics with more exotic or unconventional means. And because biological attacks against the agricultural sector are that much easier to institute than against humans, it may be the agricultural sector that is the one that is chosen. Remember, terrorists act like bodies of flowing water – they will always choose, as far as possible, the course of least resistance. And certainly if you compare agriculture with human attacks in the biowarfare, the agricultural route is the one of least resistance.

Maybe more attacks have taken place than we actually know about. And here the implication is that when investigations to disease outbreaks have occurred, the possibility of a deliberate introduction is something that has not really been at the forefront of investigations. There were suggestions in the UK that the foot and mouth disease outbreak was deliberately orchestrated – no evidence to support that, but it is starting to creep in. There have been suggestions as well that, again, with no verifying or substantive evidence to support it, that the foot and mouth disease outbreak in Taiwan was instituted, was part of a deliberate act that was instituted out of mainland China.

The biggest reason at this point may be that it's aggression that is viewed as too dry. Here, as I said, you don't have that visible, in-your-face shock statement that a more conventional bombing campaign may unleash. But if we take the view of agroterrorism not as a primary form of aggression but more as a secondary form of aggression, the utility of the agro dimension becomes far more manifest, particularly when we emphasize and when we can understand and appreciate the widespread economic and sociopolitical ramifications that could result.

And I should also say that, well, maybe an agroterrorism attack does have the ability to attract media attention, both locally, regionally, and even internationally. Certainly that occurred with the foot-and-mouth disease outbreak in the UK, and the images of all these carcasses splattered across people's televisions did have a powerful social effect. So in that sense it could be viewed as a form of theater that may be attractive to certain groups.

These are just some of the policy recommendations that may be instituted to help undermine or mitigate some of the vulnerabilities that I've been talking about. We can't change the nature and practice of farming in the U.S. It's going to be intensive; it's going to be concentrated. So we can't get away from that. And we can't certainly seek to cover up all of our vulnerabilities in an open society. It's just not possible without fundamentally altering the way in which we live.

These policy recommendations that I've put, such as investment in human and physical resources, increased veterinarian training of foreign animal disease recognition, changes in the veterinarian curriculum to focus on large-scale husbandry, greater involvement of states and local veterinarians in the overall USDA management system – that would obviously fulfill an important multiplier effect, and more effective biosecurity and surveillance.

I think the worth of these is not so much in their ability to mitigate against terrorism per se, but they all have absolute utility in that they would be very effective for mitigating against a naturally

occurring disease outbreak. And I think that's what we need to be looking at in terms of policy recommendations as we go down the track. And this applies not only to investment in the agricultural sector, if we're talking about terrorism, but it applies to terrorism investment generally.

We need to be putting in place measures that have a viable dual use capacity, ones that can be brought to bear for dealing with naturally occurring phenomenon as well as the deliberately orchestrated ones. And we've got to remember that naturally occurring outbreaks, both on the agriculture field and in the human field, are much more likely to occur than the deliberately orchestrated ones. If we had in place an effective system that could mitigate against both types of scenarios, I think we would have done a worthy job of increasing both the security and preparedness and stability of the United States. And I certainly think that a forum like this, which highlights some of these novel forms of these unforeseen areas, is a particularly useful way of getting that message out across.

And I thank you for your time this morning. Thanks very much.

Question/Answer with Dr. Chalk

Q- Floyd Horn from the USDA, and I want to compliment you. I think you should eliminate any qualifier that says you don't know a lot about agriculture. That is a tremendous piece of work, and I think we would endorse everything you've said. With regard to compensation, we have to be very careful, though, because it can become more valuable to eliminate a herd to sustain it. And I think we'll see that in Britain, in fact, that was the case. And so people were not encouraged to quickly report and eliminate their animals; they rather saw benefit in keeping or even moving and distributing their animals. So, would you comment on that please because of the comments you made about an insurance system?

A- Yeah. I was actually there when a lot of the cases were coming out about the unregulated movement of animals out of a quarantined area with people either (a) not reporting them but knowing that regulators were about to come in, and so that they got them out under the sly. And that certainly was one of the factors that was seen as exacerbating the potential spread and the rapid spread of the disease. And obviously that mitigated against even the firebreaker operations that could be instituted because the United Kingdom as compared to the United States is geographically very small, and you can get quite far in a fairly small period of time. So the whole issue of... I think it comes back down to the sense of responsibility that regulators and producers must have in terms of how they deal with these sorts of things. And often, unfortunately – and this doesn't just apply to agriculture; it applies to any industry – it's the bottom dollar that counts. And people don't really want to take on board any risks that could undermine that bottom dollar. But if you take a wider perspective and look, "Well, in doing this, I may actually be really instituting a chain of events that could be devastating, not only to my own livelihood but in terms of the greater livelihood, that would mitigate against it."

But again it goes back to this national, not only a national insurance scheme, but to be workable it would have to be at a state level. And I think that if there was confidence that by early reporting farmers – if there was a problem at hand – and producers were able to deal with the problem, that would help. But I think also another lesson from the UK – I don't know, and again I'm not a disease eradication specialist – but maybe there's a renewed case for vaccination. I was talking to one chap in Washington who was actually involved in some of the culling operations in the UK. And he was saying that maybe we have to look again at the vaccination programs now, particularly given not only the mechanics of undertaking mass culling and elimination but also

when one considers the sociopolitical ramifications of actually going down that course. So I think there's a number of issues that are in place here, but I certainly...

Yes, this sort of underground movement of animals, if you can call it that, was seen as a factor that did help to spread the disease and to mitigate against some of the quarantine mechanisms that were instituted to try and keep a particular outbreak in place in one specific geographic area.

Q- ... Clark, Texas A&M University. Wanted to come back to the comparison that you made between the accidental and the intentional introduction of either a crop or livestock agents and wondered if you believe that the intentional introduction might be done under a substantially different kind of a scenario in which there wouldn't be a single-point introduction where you would have the opportunity to surround and deal with it, but rather where such an intentional event might be done at multiple locations.

A- Yes, I can. I only want to talk in very general terms, because I suppose you've got to draw a fine line at a forum like this in terms of actually getting the information out as opposed to giving people ideas of how to do things. But certainly if there were multiple introductions of disease agents across the country and if these pathogenic agents were not of the same variety but were of different sorts, you're going to compound the problems of (a) instituting preparedness and containment and also... I mean, the USDA Emergency Management Program, as far as I know, isn't geared up for dealing with multiple viral outbreaks, particularly if they did involve several animal disease agents at one time. And that could cause a lot of problems.

And that goes again back to the idea... I mean, we shouldn't be relying on the USDA solely to deal with this issue; we just can't. The USDA doesn't have the resources to fully contain it, just in the same as the Department of Health and Human Services doesn't have the resources to contain a major human disease outbreak. It all really bears down on local responders being brought in effectively to act as force multipliers. And in that respect, that in turn goes back to the whole education and awareness at the local and state level. If that is in place, that will obviously facilitate any national levels that are instituted to augment that.

But, yeah, if you had multiple disease outbreaks across the country, you are setting yourself up for a chain of events that could create widespread economic dislocation, and it would be very difficult to actually contain that.

Q Dave Channon from the United Kingdom. I just wanted to congratulate Peter on his clear understanding of the situation in the U.S. You might tend to think that some of these comments are exaggerated. I can tell you they're not exaggerated. The effect on the government, the effect on the public, the effect of the television is very dramatic, and you should be well aware of a similar situation happening with a large feedlot in the U.S. It will be quite a dramatic situation. Congratulations, and thank you very much for your clear presentation of the UK situation.

Q- A fair, quick question. I'm June ... from Rhode Island College. And I think that you very distinctly pointed out problems, and the solutions to those problems were very obvious. And I just wonder if those solutions, do you see any movement towards some of those solutions?

A- I do, in a number of respects. Certainly there has been heightened awareness of the problem, and that has filtered up to the federal government. An agroterrorism bill has now been introduced, and there have been a number of Senate hearing committees, which in the past have merely focused on the introduction of contaminants into the food chain as part of the traditional

bioterrorism scenario but are now increasingly broadening the focus to the agricultural dimension as a whole. So I think that there has been movement. And the newly created office of Homeland Security that Tom Bridge is going to be heading up, I understand that representatives from the USDA will be within that. So again there seems to be across-the-board recognition that the agricultural sector needs to be protected as well as any other.

I only hope that as we go down the road – and this comment applies across the board, not only to agriculture – but that the way in which resources are invested find their way to local responders. Because at this stage the anti-terrorism budget that the U.S. has spent over the last seven years has ballooned. And a lot of that money has been invested in federal hands and hasn't found its way down to the local responders where it's needed. And the result has been that, if you ask a lot of local responders, "Are you getting what you need?," they say, "No."

So I think that there has been a greater awareness of this issue, and I also think that as we go over the next few months and years, we are going to see awareness of the need to assure that resources that are pumped in are also instituted in such a way that they do filter right down through the system. As long as that occurs, I think we will be making substantial progress in our ability to deal with the issues of terrorism in general.