Moderator: Hello and welcome to the third Thursday breakfast broadcast. Before we get started, I would like to ask that you please fill up your online evaluation. Continuing education credits are available and your feedback is helpful in planning future programs. We encourage you to let us know how we can best serve your needs. We are taking questions throughout the hour. 800-452-0662, or you can send written questions by fax. Today's program is food safety with Dr. Dale Morse. Thank you very much for joining us today.

Dr. Morse: Good morning. It's my pleasure to be here and to share some of my team's experiences with food borne illnesses.

Moderator: Thank you. Food borne diseases are changing. How have things changed from earlier times?

Dr. Morse: If you look at this quote from the Bible, "I'm poured out like water and my heart is like wax" and you would think that not much has changed. This illness has been around for a long time. And certainly, anyone who has had to hug a toilet due to vomiting and diarrhea related to food borne illnesses.

Moderator: We know that it has been around for as far back as we could remember. Do you have an example of food borne illness or outbreaks and what they look like in modern times?

Dr. Morse: Symptoms may have been similar for a long time. We've seen a change in the pattern of types of outbreaks and sources over time. To get a better look at this, perhaps we should back up historically to see where the most changes occurred over the last century. If you look at a typical food borne illness outbreak from 1940 to 1970, there was an outbreak in New York associated with a church supper. That was due to consumption of the vanilla ice cream that was contaminated by a food worker. That outbreak was typical of outbreaks at that time. 46 people became ill. An investigation was done by a small team of epidemiologists, Environmental Specialist, and a laboratory. All the illnesses occurred over a short period of time. It was able to be traced back very quickly and resolved. That was typical of a lot of outbreaks at that time.

Moderator: What sort of changes in types of outbreaks have occurred since then?

Dr. Morse: There have been a number of changes in the patterns of outbreaks. For example, instead of the local outbreak like a church supper outbreak, it has become more regional, national, or global in scope. Their occurrence can be widespread instead of isolated to a local area. The detection quite often occurs in the laboratory through modern methods, and less often in the field. The time frame could be propagated to, or occur, over several weeks or months. Also, the scale of contamination can now be very large and involve thousands or millions of pounds of product contamination versus a small amount.

Moderator: We know that food borne illnesses have been around for a long time. Have they always been caused by the same bacteria?

Dr. Morse: A lot of the bacteria that cause food borne illness have been around for a long time, but our recognition has improved with better laboratory tests and ability to recognize them. This slide shows
reportable food borne diseases in New York State. A number of them have been around for a long time. If you look at the ones in red, it's been the last couple of decades that they were originally identified and tested were developed. That has led to recognition of outbreaks with a new foods. Things that we did not recognize before.

Moderator: Where else have these new food borne concerns originated?

Dr. Morse: Recently, the use of antibiotics and humans and animals, the development of drug-resistant strains. This has been a problem because those infections tend to be more serious, a high risk of death, because they cannot be treated as easily. The next slide shows a typical headline that describes an outbreak that was caused by a type of salmonella that was drug-resistant and that was spreading throughout the country.

Moderator: You described an example with meat products. How about fruits and vegetables? Why have food borne illness associated with these staples changed over time?

Dr. Morse: With the globalization and the ability to move food items long distances, we've seen a dramatic increase in the amount of fresh produce available. For example, there's been a 28% increase in fresh produce between 1970 and 2000. Furthermore, a number of these fresh products have come from international sources with an increase from 11% in 1990 to 15% in 2005. We are now able to get food items from around the world.

Moderator: Would it be fair to say that instead of as the populations accidentally by diseases in terms of travel and what not, food borne issues are coming to us as opposed to the other way around? This is no longer an issue of what is growing in our own backyards.

Dr. Morse: As Dan describes in the next slide, we eat out of everybody else's garden. With the globalization and shipping food items from around the world, you know longer have to travel to foreign countries to develop a foreign sickness that your immune system is not able to respond to as well. Now you can get ill in your own home from organisms that you would not have been exposed to before.

Moderator: Things are changing and they are changing rapidly. How big is the problem of food borne illness within the United States?

Dr. Morse: It is huge. If you look at the data looking at illness in the United States. Estimated 78 million illnesses and over 300,000 hospitalizations and over 5000 deaths on an annual basis. Most of this is erratic and it occurs individually. Over 1300 food borne outbreaks occur every year. Most of the people at highest risk for illness are in population of young, old, pregnant, and immune compromised. And the cost of this is also tremendous. If you look at the seven major infections that cause an estimated $9 billion to $48 billion each year in the United States.

Moderator: Incredibly huge. If the burden of illnesses is that large, and I certainly believe that it is that large, then why do we not hear more about this?
Dr. Morse: Partly because only a small part of the illness is recognized. If you take the estimates I gave earlier, they were extrapolated from data obtained that was part of a national network that works with the CDC to do surveys of different populations to get more accurate estimates. If you look at this iceberg pyramid type of figure, if you look at the top of the pyramid, that's the small number of cases that are reported to CDC and officially noticed. If you track that back, if you have a number of people exposed to a potential pathogen, not everyone gets sick. People who get ill get a range of symptoms. Some will be very mild and never seek medical care. People who are more severely ill will tend to go to physicians. That could be after two or three days. Only a small percentage would be recommended to get special cultures. Only some people will have a stool culture taken. Then you are dependent on the laboratory doing a proper test. Once the laboratory does that, you are dependent on them sending that to a reference lab for confirmation and potential DNA fingerprinting. It is estimated that only one out of 20 to one out of 30 cases are ever reported. It represents a much larger problem.

Moderator: And a tremendous challenge. What sorts of challenges are associated with this burden of food borne illness?

Dr. Morse: There are many challenges. It is a number of different pathogens and toxins. It's estimated that there are over 250 pathogens and toxins transmitted by food, and many more continue to be identified. Also, it's complicated because the pathogens can also be transmitted in other ways, through water, or from person to person. Making accurate estimates on how much is due to food is always a challenge. Also, these pathogens can be transmitted through different foods. There's a number of pathogens, as shown at the bottom, that affect the number of humans. This norovirus has been associated with cruise ships. We have one to two outbreaks each year related to nursing homes. That's relatively mild. Salmonella is a bacterial infection, which causes more severe illness. The most severe has been e. Coli 0157 and listeria, with smaller number of cases, but a higher number of deaths. The challenge of different pathogens and different food items is tremendous.

Moderator: What has New York's State's experience been with food borne illness?

Dr. Morse: Are we going to have a video clip?

Moderator: Sure. Let's take a look at the video. We know how much food in terms of subjects are to contamination. We discussed that a little bit. Let's take a look at the impact of food borne illness and some examples of that.

*Video Clip: The Tainted Dinner*

Husband: Hey, honey. I went food shopping at the amazing Foods mart.

Wife: Good. I heard they had all kinds of international food. It is a lot different than the stuff my grandparents use to buy.

Husband: I'm going to cook us an international dinner.

Wife: OK.
Voice: Are you sure you want to eat that?
Wife: Of course we want to eat that.
Voice: Pot-pies have been linked to a salmonella outbreak.
Husband: I will make tacos.
Voice: E. Coli.
Wife: Salad?
Voice: More E-coli.
Husband: I have a cheese ball.
Voice: Listeria.
Voice: Tomatoes have had Salmonella, same with apples. Chili sauce has had botulism. Salmonella has been linked to cantaloupe, and peanut butter. Even your salt and pepper could have some as well as your cereal.
Wife: Is there anything we can buy the store that has not been tainted?
Voice: Most of what you buy will be safe, but this day and age with mass production and food shipped from overseas, of the risk of wide spread food borne illness is greater than any other time.
Husband: Is there anything we can do?
Voice: You can find out more at food safety.gov. You can find out other information about staying safe in the kitchen.
Wife: I guess he is the only one eating tonight. Sorry.

Moderator: Dr. Morris. Just what types of foods are going to make us sick? Is it as widespread as we think it may be?

Dr. Morse: Despite the tongue in cheek nature of this video clip, our food supply is incredibly safe. There's a number of safeguards to keep it that way. However, we must maintain constant vigilance along the food chain because the potential exists for contamination. That means we need to have an educated public to understand risks and not cross contaminating items. From the farm, there need to be best practices to minimize contamination of produce. It's a constant vigilance. We must maintain the safeguards we have through regulations or face potential consequences.

Moderator: The video says the risk is higher than ever. Is that the case?

Dr. Morse: I think that is probably referring to the widespread nature of the outbreaks and a greater awareness that they can occur because we are producing food items in large quantities that are shipped
throughout the country. There’s a potential for these widespread outbreaks. A number of steps have reduced some of the outbreaks.

Moderator: Now let’s take a look at New York State’s experience with food borne illness and diseases.

Dr. Morse: Unfortunately, in New York, we’ve had lots of experience with food borne outbreaks. This shows outbreaks since 1980. It shows some patterns of the types of outbreaks. When I first came to the state in 1980, we saw the typical, local outbreaks. At that time, we trained a number of sanitarian environmental specialists, and nurses around the state in the best methods of conducting food borne outbreak investigations. That was fortuitous. We actually saw a change in pattern with a number of very large outbreaks associated with clams, oysters, and eggs. The clams and oysters caused a viral illness. The eggs were associated with salmonella. These outbreaks involved large numbers of people. During that decade, New York reported 23% of the National outbreaks, while only having 7% of the population. That was not because of food practices that were worse in New York, is just that we have trained our field staff to do better investigations. We also had a very strong Commissioner, Dr. Axelrod, who believe in taking strong action to prevent illness. It was also a time of weak federal regulations and the state had to take actions to prevent this type of illness. There was a reduction in those illnesses. The number of outbreaks has gone down, but we’ve seen an increase in the number of multistate outbreaks of food items that continue to occur and draw headlines.

Moderator: Can you tell us a little bit more about what approaches were used to investigate and control the shellfish and egg-Associated ones that you described?

Dr. Morse: I said, we have a public health champion in Dr. Axelrod who believe in using science to take action, as shown by the next quote. “We must remain devoted to the canons of science that are so much part of the practice of medicine and the practice of the allied arts. To do otherwise would be to build public policy on quicksand.” He used that knowledge as when the clam outbreaks were occurring, and the headline focused attention on a problem, Dr. Axelrod insisted on strong science and epidemiology.

Moderator: What was the epidemiology of that outbreak?

Dr. Morse: That is summarized in the next slide, from an article in "The New England Journal of Medicine." It describes the number of outbreaks that occurred over a five-year period. During that time, we had over 100 outbreaks. There’s a part of the pyramid -- there are 30 illnesses for each one we recognize or have identified. There was an association of illness with clams or oysters. There was a dose response relationship, the more you ate, the higher your risk of illness was. We were also able to identify for the first time that these outbreaks were due to a virus. To show that, we were able to trace them back to sources in multiple states in the Northeast.

Moderator: What actions were taken?

Dr. Morse: There were several actions, beginning with education, which is on the next slide. Warnings to the public not to eat raw shellfish, how to cook shellfish properly, and properly clean, handling, and
storage. And enforcement actions, such as inspections and giving citations to sellers that did not have the proper tags. 14% of those were fined because of that. We were able to trace it back to food and water where people were harvesting, we were able to shut those down. And a powerful tool called embargo. The State would stop a shipment from a producer until they took proper action. This, along with scientific and legislative briefings, which were the long-term solutions, helped control this.

Moderator: Did New York partner with anyone in tackling this issue?

Dr. Morse: At that time, New York was taking more unilateral action. There were weaker regulations. Our commissioner took a very strong action. That big stick work for a while in that time, but things have changed to dramatically since then. We have many more agencies and partners. We have a much more collaborative approach currently.

Moderator: What was the outcome of these actions?

Dr. Morse: We saw a dramatic success story and a reduction in outbreaks associated with clams and oysters. Better enforcement allowed easy to trace back to the product, and uniform standards in terms of labeling. The next slide shows how this affected a dramatic decrease in the number of clam and oyster outbreaks.

Moderator: Since the shellfish outbreak, have there been more since then?

Dr. Morse: Only a small number, and they usually are associated with a new source or a contamination of a product in an area with heavy rains or runoff occurs. The number has dropped dramatically.

Moderator: And I imagine the nature of the outbreaks have changed.

Dr. Morse: Yes, now we see multistate outbreaks.

Moderator: It looks like the control measures produced those outbreaks. We continue to hear about large scale outbreaks. What is going on?

Dr. Moderator: I often think of this quote by David Brown. He said at that time, "There's something morbidly fascinating about plagues. They are the car wrecks of history that keep us rubbernecking." Not only the traffic on the other side will stop, but the traffic going in the other direction. People are also interested in what is happening. The same is true with food borne illness. The headlines seemed to grab attention.

Moderator: I think many of us remember an outbreak associated with this pathogen in a fast-food chain. Can you talk a bit about how this outbreak led to further changes, and how New York state and nation approached the safety and food borne illness investigation?

Dr. Morse: I think you're referring to this next headline. It's talking about the pathogen E. coli. This grabs people's attention. People relate. They want to know more about it.
Moderator: I understand that changing techniques in the laboratory make fingerprinting diseases easier.

Dr. Morse: Yes, E. Coli 0157, this pathogen was first recognized in the 1980's, but as a public health threat in the 1990's. There was an outbreak associated with a hamburger chain. There were over 500 cases and 4 deaths would this jack in a box outbreak. It obviously got people concerned because of a number of hamburgers consumed throughout the country. The most common is 0157 that causes bloody diarrhea and a severe illness that can lead to kidney failure and death, especially in young children, which also brings tremendous attention. It is estimated to cause 73,000 illnesses per year in the United States. It is something to be concerned about.

Moderator: And the tracking and fingerprinting of that E. coli pathogen.

Dr. Morse: Yes. At first we were very frustrated with dealing with this organism. What we have learned and Minnesota described their type of outbreaks. This shows the typical annual cases of E. coli in the early 1990's. These types of illnesses increase in the summer, which is typical of a number of bacteria, where numbers increased during warmer temperatures. We would investigate these cases and try to figure out what the source was. We asked a series of questions to try to find out. We were always frustrated by trying to find out that the food items came from multiple different sources. We made longer questionnaires.

Moderator: What did they find out? Was it one large outbreak?

Dr. Morse: The new, modern methods, where we can do DNA fingerprinting were applied to the same islet of those cases. Each color represents a different strand of e. coli. Instead of one outbreak, there were a series of outbreaks. This allowed us to look at the blue, red, or yellow, and see what they had in common. By applying questions to those cases and comparing it to people who had a different color, we were able to show that we could trace those back to a particular source. This revolutionizes the way we do food borne outbreaks. It allowed us to pinpoint potential clusters and trace it back to food items. The challenge of this is that it takes several weeks to get from somebody getting ill to go to the doctor to go to the laboratory and do this kind of testing. With a two week delay, you have to interview people a long time after they ate something. I do not know how you will remember what you ate yesterday or last week or last month, but it gets more and more difficult the further you get away from the exposure.

Moderator: Speaking of outbreak investigation, let's take a look at the laboratory.

*Video*

Nellie Dumas: I’m the associate director of the bacteriology Laboratories, which are the laboratories for the state of New York. We do a lot of public health work. This is what we're talking about today, testing food when there are outbreaks, and what our procedures are, and how we incorporate this with the epidemiologists and local health departments, and how we do investigations. We are involved in a surveillance of food. We test the food, as needed, within the investigation of an outbreak. The highlight is our in house developed molecular techniques. Over the past 10 years, we have developed molecular
real time tests, looking for DNA and amplifying that the DNA in these food items. The gold standard is what we call conventional testing. You grow them and identify them by biochemical’s. Tim is starting his process of working on the food item. What we are working on today is ground beef. The process we will take you through today is how we test for e. coli 0157. Tim will weigh the product because we use conventional standardized testing. Tim is using an enrichment broth that will help enrich the meat, if the organism is there. Tim will take the bag and put it in the grinder. Then we take this material. It will be placed in an incubator. It will be incubated for 24 hours. Leanna will be doing in the conventional testing of the meat. She is looking at the actual organisms that grew from the meat. It was placed here and incubated. She is now working with the organisms that have grown. She will be testing to see if it is possibly E. coli 0157, or if it is what is normal bacteria that grows in meat. They look alike. She will look for suspicious pathogen organisms. She will test and identify them by conventional methods. Tammy is working in the process of genetic testing. She has the enrichment broth from the meat that was incubated, and she will star the molecular testing. Tammy is putting the samples that are being processed for DNA extraction onto the machine. It is an automated machine that will extract out the pathogenic dna that we are looking for. This is for sugar toxin DNA from e. coli that we’re looking for. This is the final version of the molecular testing. She is analyzing the DNA data from our molecular test. She is analyzing the DNA from the meat for E. coli is present or not. Diana is making a DNA plug. We started with live organisms. She is taking the organism and has extracted out the DNA and put into these plugs. This is part of the end of the process. Diana had prepared the plugs. They are placed in this piece of equipment. After the gel is removed, it is stained. The DNA shows up as these black bar codes in the software that we used to analyze the DNA patterns. This is our message before fingerprinting of these pathogenic organisms. Diana has E. coli 01757 on the screen. This testing is standardized. All public health laboratories in NYS use this procedure for DNA fingerprinting of patients and food items. Our piece is very integral it in public health and getting this done as quickly and as accurately as possible and to help epidemiologists and local health officials to remove the source of the infection.

Moderator: That was a terrific video and a really takes us through the great things that are happening with the New York state food safety laboratories. There are some clarifications. All of our food has some form of bacteria.

Dr. Morse: bacteria are normal on a number of food items. That is why we refrigerate foods. What we want to avoid is viruses that can cause human illness.

Moderator: OK. We are going to be taking calls throughout the day. You can call in or fax and your questions at any time. 800-452-0662 is the toll-free number, or you can send your questions by fax. I am little lost here. Has Technology caught up to the changing outbreaks?

Dr. Morse: We’ve used in these modern methods. In New York, we started using those right after the paper was published. This illustrates three major outbreaks that we were involved with that were large scale in nature. The first was in 1998. It was a salmonella outbreak involving cereal. Shortly after, there was one associated with hot dogs and Deli meats. There were 49 in New York, including a number early ones. In 1999, at a very large County Fair outbreak, there was contamination of water and sno cones,
and leading to a large amount of illness. There was also an illness with a second pathogen. This technology was put to use the very rapidly and help document these types of outbreaks and helped lead it back to the actual source.

Moderator: Sounds like these outbreaks involve multiple states and multiple agencies. House information shared between them?

Dr. Morse: One thing that was developed out of this was a system that is a network of laboratories that share DNA fingerprinting of testing results from humans, food, and animals. By sharing these patterns across state boundaries, we’re able to pool individual cases together to identify clusters of unusual strains. This technology was akin to the Hubble Space Telescope, which led to the identification of never known before galaxies. Molecular fingerprinting allowed for recognition of outbreaks that would have been completely unidentified before then.

Moderator: What has happened since then? What has the impact been in New York?

Dr. Morse: There has been a paradigm shift. We’ve been involved with multiple state outbreaks. From 1998 until 2008, we were involved with 31 outbreaks involving 24 different food items. Ground beef was the most common. There were also new food items that had not been identified previously. These outbreaks, as shown here, had a number of states involved. There were an average of 16 states. U.S. cases ranged from nine to 1400. New York contributed 18 cases to these outbreaks.

Moderator: What has the impact been nationally?

Dr. Morse: There has been a similar pattern. If you look at last four years of outbreak investigations, this shows 20 large outbreaks. Of note, in red, 12 of the 20 involved the identification of a new food vehicle. You can think back to the video clip with the shopping bag. You could see items such as carrot juice, tomatoes, frozen pizza, peanut butter, pot pies, and even dog food. I guess my favorite is cookie dough which as prepackaged can be a source of illness. That could be a potential risk of illness if you use raw eggs.

Moderator: Can you use one of these outbreaks to illustrate how these outbreaks were recognized?

Dr. Morse: Since the ground beef has been associated with E. coli, we can focus on one that occurred in 2007. At the time that began, 12 cases were identified through this DNA fingerprinting and were shared through pulsenet. New York contributed four. All four of those people had eaten ground beef. Two of those people had 17 frozen hamburger patties leftover. They were frozen in the freezer. We were able to test those at the state lab and identify four that were identical to the outbreak pattern, and four had a different pattern. New Jersey also had several people ill. 18 patties from those people were tested and were negative. The USDA held off until further testing to take action.

Moderator: What happens next?

Dr. Morse: In New York, we wanted to identify the source, so we tried working with our agriculture markets and health departments to look for unopened boxes of this product. We issued a joint
consumer advisory based positive and were able to test some patties from boxes that were not opened. We confirmed that E. coli was in those. USDA posted a recall notice.

Moderator: What was the total impact of this outbreak?

Dr. Morse: It was fairly dramatic and widespread. This summary is in the next slide. This involved 10 states with 43 cases. They were able to test 10 meat samples that were positive. It showed 11 different patterns. Five of those were found in people who became ill. In New York, we had 13 cases. 12 of those were recalled concerning ground beef. 10 of 12 were recalled concerning this brand. Once it was identified and we could link the human cases to a food source, it led to a nationwide recall of 21 million pounds of ground beef. This was traced back to a Canadian firm in Alberta. This was the second-largest recall in the United States. It was the equivalent of a year’s production from this plant. This shows a massive, a potential nature of contamination that could occur at a plant and over time.

Moderator: That is incredible. Does the usually takes such a large number of cases in order to identify the source?

Dr. Morse: It is easier if you have more cases. If you have a smaller number of cases, it is difficult to show a clear association. However, we've had several episodes with one case of illness where we've been able to make a dramatic difference. As this example shows, in this situation, we had one person that became ill in New York with E. coli confirmed. She had an open package of ground beef patties in her freezer. When that was tested, show the same DNA fingerprint. Then we were able to use the information on the labeling. We were able to find an unopened package in Michigan that showed the same pattern. This led to a nationwide recall of thousands of pounds of beef from California. This shows how one case can make a difference. If you think back to the pyramid I showed, with one case representing a potential 20 cases or 30 cases, we were able to use the information to educate local health departments. I ask why we are investigating a single case, we can say we may be investigating a whole outbreak. This gives them time to interview the cases because of potential outbreaks like this.

Moderator: Thank you. We are taking your questions throughout the hour. You may send your written questions by fax. how is this technology affecting the way we conduct investigations today?

Dr. Morse: As a result of this, things have gotten much more complicated, as you can imagine. Think back to the church supper where it was a small, local, isolated outbreak. Now with widespread outbreaks of and multiple states and a number of agencies, we still have the investigation that starts at the local level. Then we have regional groups involved and state health department individuals from the environmental, laboratory, epidemiologists, and public affairs. On a national basis, involving agencies such as the USDA, CDC, epa, fda, and even in cases where there's a potential suggestion of tampering, we are able to have the police involved. This requires a very coordinated effort. It's probably a good time -- I did not prepare an acknowledgments slide, but I want to recognize the work of all the individuals who contributed to the information for this. I wanted to recognize all the work that they've done to try to solve this problem.
Moderator: This is a terrific slide. It illustrates not only how comprehensive the partnering is in terms of addressing food borne outbreaks, but it also is very complicated.

Dr. Morse: That is correct. To imagine the communication issues. How do you share information rapidly? One way is through electronic information, shared information. You can move data quickly. You can get lab results immediately instead of waiting for them to be shipped in the mail. And also, conference calls, video conference calls with partners throughout the country. And imagine how we did this years ago.

Moderator: What is happening at the national level to address this very rapidly changing landscape?

Dr. Morse: A number of things are going on nationally. We talked about some of those, such as the Food Net, Pulse Net. There are also groups like the council to approve food borne outbreak response. There are a number of acronyms listed. These are a group of organizations from the local, state, and federal level who have been collaborating to work on various outbreaks.

Moderator: They are developing the guidelines and building consensus, and constantly shaping how to better conduct these investigations in a more collaborative way.

Dr. Morse: Yes, and with a team approach from different people in different disciplines, different technologies, and learning how to share information rapidly in this age of globalized food supply.

Moderator: Since you talked mostly about changes in outbreaks over time, what changes have there been in food borne illness in general?

Dr. Morse: That's a great question. We focused mostly today on outbreaks and investigations, which is a small percentage of illnesses that occur. We have a number of diseases that are food borne. We have tracked those over time. They are shown in this next slide. This is data provided by the 10 states with the CDC that are tracking illnesses that occur in different communities throughout the United States. These are individual cases that are not necessarily associated with outbreaks. Through the 1990’s, there were dramatic drops after the Jack in a box outbreak. It led to a drop in E. coli and Listeria. There were no significant changes in salmonella and the organisms like the one shown on the slide. We actually had a 47% increase. We've seen some progress. It's slow. We need to take further actions to try to be more successful.

Moderator: We've made significant inroads, but we still have a long way to go.

Dr. Morse: That’s correct.

Moderator: We have several questions. Here is the first question. You did not mention mad cow disease. Do you find that it is a concern in the United States? Are our priorities considered, are these considered a pathogen?

Dr. Morse: Mad cow disease service in the United Kingdom in the 1990’s. A major concern because of pathogen’s transmitted through beef products to humans that were developing a delayed neurological
disorder. We have not had cases linked to our own food supply. We did use some of the same food practices as were used in the United Kingdom. We have to be aware of the potential. There have been a few cattle identified with it. We must maintain vigilance. We're one of several states that have been tracking cases of the CJD disease. There is a network of states that have been following those cases, which normally occur one per million, just to make sure that it's not occurring in this country. So far we've been very fortunate. The only cases that have been identified are individuals that have been exposed in the U.K. or other countries.

Moderator: Thank you. Here's another question. Has there been a correlation between injecting antibiotics into livestock and increased food borne illnesses?

Dr. Morse: There've been several studies that provide evidence that use of antibiotics in cattle has led to development of some resistance. At different times, they use this as a practice, not to treat the ill animals, but to give preventive antibiotics to a whole group of animals. That has led to development of various resistances.

Moderator: Thank you so much, Dr. Morris, for being with us today and providing us with this extremely useful and current information that hopefully will impact what our public health workers are doing. Thank you very much for joining us today. Please remember to fill out your evaluations on line. Your feedback is always helpful to the development of our programs. We're now archiving our programs on itunes as podcasts. They will be up by early next week. Our standard Web stream archive will be up in a week or two. Please join us for our next Webcast on February 25. This will be a special addition called "Building healthy communities through universal design." See you next time. Thank you very much.

Dr. Morse: Thank you. Thank you to my team out there.

Moderator: Yes, thank you.