EXAMINATION OF FEDERAL AND STATE RESPONSE TO AVIAN INFLUENZA

HEARING

BEFORE THE

SUBCOMMITTEE ON LIVESTOCK AND FOREIGN AGRICULTURE

OF THE

COMMITTEE ON AGRICULTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTEENTH CONGRESS

FIRST SESSION

JULY 30, 2015

Serial No. 114–25

Printed for the use of the Committee on Agriculture
agriculture.house.gov

U.S. GOVERNMENT PUBLISHING OFFICE

95–814 PDF WASHINGTON : 2015

For sale by the Superintendent of Documents, U.S. Government Publishing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON AGRICULTURE

K. MICHAEL CONAWAY, Texas, *Chairman*

RANDY NEUGEBAUER, Texas, *Vice Chairman*
BOB GOODLATTE, Virginia
FRANK D. LUCAS, Oklahoma
STEVE KING, Iowa
MIKE ROGERS, Alabama
GLENN THOMPSON, Pennsylvania
BOB GIBBS, Ohio
AUSTIN SCOTT, Georgia
ERIC A. "RICK" CRAWFORD, Arkansas
SCOTT DESJARLAIS, Tennessee
CHRISTOPHER P. GIBSON, New York
VICKY HARTZLER, Missouri
DAN BENISHEK, Michigan
JEFF DENHAM, California
DOUG LAMALFA, California
RODNEY DAVIS, Illinois
TED S. YOHO, Florida
JACKIE WALORSKI, Indiana
RICK W. ALLEN, Georgia
MIKE BOST, Illinois
DAVID ROUZER, North Carolina
RALPH LEE ABRAHAM, Louisiana
JOHN R. MOOLENAAR, Michigan
DAN NEWHOUSE, Washington
TRENT KELLY, Mississippi

COLLIN C. PETERSON, Minnesota, *Ranking Minority Member*
DAVID SCOTT, Georgia
JIM COSTA, California
TIMOTHY J. WALZ, Minnesota
MARCIA L. FUDGE, Ohio
JAMES P. MCGOVERN, Massachusetts
SUZAN K. DELBENE, Washington
FILEMON VELA, Texas
MICHELLE LUJAN GRISHAM, New Mexico
ANN M. KUSTER, New Hampshire
RICHARD M. NOLAN, Minnesota
CHERI BUSTOS, Illinois
SEAN PATRICK MALONEY, New York
ANN KIRKPATRICK, Arizona
PETE AGUILAR, California
STACEY E. PLASKETT, Virgin Islands
ALMA S. ADAMS, North Carolina
GWEN GRAHAM, Florida
BRAD ASHFORD, Nebraska

SCOTT C. GRAVES, *Staff Director*
ROBERT L. LAREW, *Minority Staff Director*

SUBCOMMITTEE ON LIVESTOCK AND FOREIGN AGRICULTURE

DAVID ROUZER, North Carolina, *Chairman*

BOB GOODLATTE, Virginia
STEVE KING, Iowa
SCOTT DESJARLAIS, Tennessee
VICKY HARTZLER, Missouri
TED S. YOHO, Florida
DAN NEWHOUSE, Washington
TRENT KELLY, Mississippi

JIM COSTA, California, *Ranking Minority Member*
STACEY E. PLASKETT, Virgin Islands
FILEMON VELA, Texas
RICHARD M. NOLAN, Minnesota
CHERI BUSTOS, Illinois

CONTENTS

WITNESSES

EXAMINATION OF FEDERAL AND STATE RESPONSE TO AVIAN INFLUENZA

THURSDAY, JULY 30, 2015

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON LIVESTOCK AND FOREIGN AGRICULTURE,
COMMITTEE ON AGRICULTURE,
Washington, D.C.

The Subcommittee met, pursuant to call, at 8:31 a.m., in Room 1300, Longworth House Office Building, Hon. David Rouzer [Chairman of the Subcommittee] presiding.

Members present: Representatives Rouzer, Newhouse, Kelly, Conaway (*ex officio*), Costa, Nolan, Bustos, and Peterson (*ex officio*).

Staff present: Caleb Crosswhite, Carly Reedholm, Haley Graves, Jessica Carter, John Goldberg, Matt Schertz, Mollie Wilken, Mary Knigge, Matthew MacKenzie, and Nicole Scott.

OPENING STATEMENT OF HON. DAVID ROUZER, A REPRESENTATIVE IN CONGRESS FROM NORTH CAROLINA

The CHAIRMAN. This hearing of the Subcommittee on Livestock and Foreign Agriculture on the examination of Federal and state response to avian influenza, will come to order.

I would like to thank our witnesses for appearing before the Subcommittee this morning, and I appreciate the attendance of our colleagues here on the dias as we begin our formal review of the recent outbreak of highly-pathogenic avian influenza, or the bird flu, for short.

As we will hear from our witnesses, this was, without a doubt, one of the worst, if not the worst, animal disease outbreaks our country has ever faced. More than 220 farms were infected in 21 states, nearly 48 million chickens and turkeys were depopulated, and hundreds and millions of dollars have been spent.

The Subcommittee has been following these events for some months, but specifically chose to delay any formal oversight until the disease was under control to prevent diversion of the agency's attention in the middle of a crisis. As we begin this review, let me state that it is not, again, it is not, our intent to be a Monday-morning quarterback in any shape or form; rather, we want to learn from experience.

We want to highlight what was done right by identifying areas where improvement was made, where opportunities for further improvement exist, and most importantly, figure out where we need to focus as we prepare for another possible outbreak this fall.

As most observers know, the heat of the summer is primarily responsible for the interruption in disease transmission, but as fall

approaches and temperatures begin to drop, we need to be prepared for more cases, possibly covering a larger geographical area.

A number of issues have arisen that need further discussion. For instance, the approval of an effective vaccine is on the horizon. But if we utilize this tool, we will need to ensure that trade is not disrupted. Questions persist regarding the efficacy of the industry's biosecurity plans, while many farms have exceptional biosecurity procedures and mechanisms in place.

Some observers have raised questions regarding the degree to which biosecurity protocols are being followed. We are certainly aware of some of the resource limitations that delayed depopulation, disposal, and disinfection early in the outbreak. And as repopulation commences, several Members have heard from constituents raising questions related to some of the challenges that lie ahead.

We recognize that preventing further outbreaks is a critical priority. That said, we are mindful of the financial burdens producers are facing, particularly if they are unable to get back up and running in a timely fashion. After all, as my grandfather used to always tell me, time is money.

We will likely also hear about concerns related to indemnification. The law is fairly clear regarding the payment of fair-market value for animals that are destroyed. But how fair-market value is defined and determined, obviously, is subject to some discretion. We are faced with a set of issues here that are complex, and we will welcome any and all suggestions on how this Subcommittee might be helpful as we move forward.

In particular, I am aware of the program created in the Plant Protection Act for disease management and prevention, and wonder if it might not be time to examine whether a similar mechanism in the Animal Health Protection Act might yield a more responsive funding mechanism to facilitate a quicker and perhaps a cheaper and more effective response.

[The prepared statement of Mr. Rouzer follows:]

PREPARED STATEMENT OF HON. DAVID ROUZER, A REPRESENTATIVE IN CONGRESS FROM NORTH CAROLINA

Good morning. I appreciate the attendance of our colleagues and witnesses as the Subcommittee begins its formal review of the recent outbreak of highly-pathogenic avian influenza.

As we will hear from our witnesses, this was without a doubt one of the worst, if not the worst animal disease outbreaks our country has ever faced. More than 220 farms were infected in 21 states, nearly 48 million chickens and turkeys were depopulated, and hundreds of millions of dollars have been spent.

The Subcommittee has been following these events for some months but specifically chose to delay any formal oversight until the disease was under control to prevent diversion of the agency's attention in the middle of a crisis.

As we begin this review, let me state that it is not our intent to be a Monday morning quarterback. Rather, we want to learn from experience. We want to highlight what was done right by identifying areas where improvement was made; where opportunities for further improvement exist; and most importantly, figure out where we need to focus as we prepare for another possible outbreak this fall.

As most observers know, the heat of the summer is primarily responsible for the interruption in disease transmission, but as fall approaches and temperatures begin to drop, we need to be prepared for more cases, possibly covering a larger geographical area.

A number of issues have arisen that need further discussion. For instance, the approval of an effective vaccine is on the horizon, but if we utilize this tool, we will need to ensure trade is not disrupted.

Questions persist regarding the efficacy of the industry's biosecurity plans. While many farms have exceptional biosecurity procedures and mechanisms in place, some observers have raised questions regarding the degree to which biosecurity protocols are being followed.

We are certainly aware of some of the resource limitations that delayed depopulation, disposal and disinfection early in the outbreak.

As repopulation commences, several Members have heard from constituents raising questions related to some of the challenges that lie ahead.

We recognize that preventing further outbreaks is a critical priority. That said, we are mindful of the financial burdens producers are facing, particularly if they are unable to get back up and running in a timely fashion. After all, time is money.

We will likely also hear about concerns related to indemnification. The law is fairly clear regarding the payment of fair market value for animals that are destroyed, but how fair market value is defined and determined appears to be subject to some discretion.

We are faced with a set of issues here that are complex, and we would welcome any and all suggestions on how this Subcommittee might be helpful as we move forward. In particular, I am aware of the program created in the Plant Protection Act for disease management and prevention, and wonder if it might not be time to examine whether a similar mechanism in the Animal Health Protection Act might yield a more responsive funding mechanism to facilitate a quicker, and perhaps a cheaper and more effective response.

I now yield to the Ranking Member, Mr. Costa for his opening statement.

The CHAIRMAN. I will now yield to the Chairman of the full Committee, if he has any comments that he would like to make.

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

Mr. CONAWAY. No. Just anxious to hear from our witnesses. Thank you.

The CHAIRMAN. Thank you, Mr. Chairman.

I also see that we have the Ranking Member, Collin Peterson. Mr. Peterson, if you have any comments you would like to make.

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

Mr. PETERSON. Thank you, Chairman Rouzer, and Chairman Conaway. Thank you for holding this hearing today.

My district is probably ground zero of the outbreak that has happened. And as everybody knows, avian influenza has impacted the poultry growers not only in my district but in other places of the country. I think USDA and my State of Minnesota have done good work, and I want to especially single out Dr. Clifford and Dr. Hartmann for the work that they have done, and welcome Dr. Hartmann from our State of Minnesota here today, and to the Secretary.

As I have gone through this, I have been on the phone I don't know how many times talking about problems that have arisen, and they really responded, I don't think you could have done a better job in responding to the things that developed.

The situation, it hasn't been perfect, but perfection is hard to come by when you are in the middle of a crisis. So as the Chairman said, now is the time to go over the lessons that we have learned and figure out how this will help us develop a better plan if we have this kind of an outbreak in the future.

There are three areas that I would like to address today that have been brought forward by my growers. One of them is simplifying the indemnification process. I keep hearing that people are concerned about the amount of paperwork that they have to fill out. One grower had 77 pages of paperwork, so we have to do a better job of figuring out how to deal with that.

The other thing that comes up is this case manager issue, where, I, in fact, just last week, I had a grower I met with was on his seventh case manager. And so in that particular situation, they are still rolling them over. So somehow or another we have to figure out a way to address that.

And, Dr. Hartmann, I don't know if Minnesota has resources to help with that, but I may ask you about that later.

I also look forward to a status update on the workable vaccine. Dr. Swayne, we appreciate the work that you do and have done. Having an available vaccine is something that is very much high on the agenda of my growers as they repopulate. If we have a recurrence this fall, that is something that they want to have in their toolbox. And, I want to discuss that with you, how that all is going to come forward, when we get into questions.

And I also want to look at ways to speed up the depopulation effort. That is an area that I think we have learned a great deal about. It is especially in the layer operation it has been a real problem and this is one area that we need to focus more on.

So, again, I thank the Chairman and the Ranking Member for holding today's hearing, and look forward to the witness' testimony and the question-and-answer period. I yield back.

The CHAIRMAN. Thank you, Mr. Peterson.

As always, our Ranking Member has impeccable timing. Mr. Costa.

OPENING STATEMENT OF HON. JIM COSTA, A REPRESENTATIVE IN CONGRESS FROM CALIFORNIA

Mr. COSTA. Thank you very much, Mr. Chairman.

Timing is all about what we do. And the time for this hearing is today because the avian flu that has taken various regions of this country is serious, and it is dramatic. And it has been devastating when we look at the amount of flocks of poultry that has been impacted, not only as my colleague, the Ranking Member of the full Committee, stated, but also in California.

We have had a number of poultry farmers and processors that have been impacted, some in my home district, where the first reported cases of avian influenza took place. But unlike the Midwest, we have been able to contain it, and we have been able to control it. So my heart goes out to those in other parts of the country where it has continued to progress.

Two key producers in my state have reported the cases relayed to me and actions that were taken by the United States Department of Agriculture as well as California Department of Food and Agriculture, and they were very positive in their response. We were lucky, bottom line, in the outbreak, and it was contained and it didn't spread, due to a combination of factors. And I am looking forward to hearing the testimony today by our witnesses as to how

we can take those examples but also others that are being implemented around the country.

Our program, we think, is sophisticated. We think it is strong as it relates to biosecurity and one of the reasons our producers were able to, we think, control the spread in California. But there are other examples and methods that other states are employing that I hope we will hear about here this morning within the Eastern Flyway to prevent the spread of the disease.

As we know, it has been a part of the various flyways of the transmigration of this avian influenza that has caused the impacts. And while state regulations and biosecurity measures can only do so much, we need to do more to provide a vaccine for high-path avian influenza, and there needs to be more research and funds dedicated to that.

One thing we have heard industry representatives say is the need for more investment in the Southeast Poultry Research Laboratory, and I am pleased that Dr. Swayne is here to testify on that part. And while the Southwest Poultry Research Lab plays a critical role, especially when it comes to the development of possible vaccination, we also have research done in institutions in California, like at Fresno State, my alma mater, as well as Davis, where we have had a lot of efforts to provide support and assistance in discovering more information about the high-path avian influenza.

The new national poultry improvement plan, which we will hear more about this morning, has allowed companies to participate in a surveillance program, coupled with 100 percent indemnity. And of course, that has been a part of the discussion in terms of how we deal with this. I can't say that our response in California was perfect, but we certainly didn't face the same scale of outbreak that has been faced in the Midwest.

And I hope through this hearing, Mr. Chairman, we can better understand what practices work best and learn from the successes of each state to minimize the negative impact that the high-path avian influenza has had during the spring fly season. And we know that there is going to be on upcoming fall fly season. Certainly, Congressman Peterson can testify to that; as an avid hunter, he is very familiar with the various seasons.

So I very much look forward to the testimony of those from the United States Department of Agriculture, the state representatives, and I hope this morning we can learn from each other. Thank you.

The CHAIRMAN. Thank you, Mr. Costa.

Mr. PETERSON. Mr. Chairman, I forgot, I would like to enter these economic impact analyses that were done by the University of Minnesota extension into the record. I was going to do that earlier.

The CHAIRMAN. Without objection, so ordered.

[The information referred to is located on p. 45.]

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

[The prepared statement of Mr. Walz follows:]

PREPARED STATEMENT OF HON. TIMOTHY J. WALZ, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

Farmers have long known that the financial health of our agricultural sector is beholden to certain external factors. Droughts, floods, disasters and disease can all have an impact on the farm which ripples outward and impacts the entire rural community. This dynamic necessitates effective government programs which can provide the tools for farmers to get back on their feet when calamity occurs and maintain farm country as the bedrock of our national economy.

In MN and the Midwest, we are facing such a calamity now with the onset of avian flu. This outbreak places both a financial and emotional strain on the producers in harm's way. You don't have to have a flock test positive to be impacted. The stress created just knowing the possibility of loss is out there is enough of a burden. I heard one producer describe it as living in a "constant tornado warning."

USDA has done an admirable job thus far in their response. The challenge is staggering, and the numbers bear this out, with reports of 48 million birds from 211 commercial barns in 21 states.

USDA cannot, and should not have to, address this situation alone. Congress should continue to provide the necessary resources which support efforts to enhance biosecurity research and deployment. Boots on the ground, visiting farms and sharing information on best practices will be invaluable, going forward.

Furthermore, we should continue to support development of a viable commercial vaccine while engaging in talks with our trading partners to make certain that vaccine use will not significantly impact export potential.

While it may be true that external factors affect the financial health of farm country, it is the resilience of our farmers working in concert with experts from State Departments of Agriculture and USDA who can overcome disaster and continue to feed and fuel the world.

The CHAIRMAN. The chair would like to remind Members that they will be recognized for questioning in order of seniority for Members who were present at the start of the hearing. After that, Members will be recognized in order of their arrival, and I certainly appreciate Members' understanding.

Witnesses are asked to limit their oral presentations to 5 minutes, if you can, please. All written statements will be included in the record.

I would like to welcome our witnesses to the table, and please note that in the interest of time, we have combined the two panels. Dr. David Swayne, Laboratory Director, Southeast Poultry Research Laboratory, USDA Agricultural Research Service in Athens, Georgia. Thank you for being here.

Dr. John Clifford, Deputy Administrator, Veterinary Services, USDA Animal Health and Inspection Service, Washington, D.C.

We also have Dr. Douglas Meckes, State Veterinarian North Carolina Department of Agriculture and Consumer Services in Raleigh, North Carolina.

And Dr. Bill Hartmann, Executive Director, Administrative Board of Animal Health, St. Paul, Minnesota.

Dr. Swayne, begin when you are ready.

STATEMENT OF DAVID E. SWAYNE, D.V.M., PH.D., DIRECTOR AND SUPERVISORY VETERINARY MEDICAL OFFICER, SOUTHEAST POULTRY RESEARCH LABORATORY, AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE, ATHENS, GA

Dr. SWAYNE. Chairman Rouzer, Ranking Member Costa, Members of the Committee, I am Dr. David Swayne, as I have been introduced, the Laboratory Director at the Southeast Poultry Research Laboratory in Athens, Georgia. We are part of the newly-formed U.S. National Poultry Research Center.

The Agricultural Research Service is committed to eradicating the high-path AI virus at the center of the current North American outbreak through providing cutting-edge research in diagnostics, molecular epidemiology, pathology, and vaccinology.

In response to the first detections of HPAI in the U.S., ARS refocused its high-path research program to the most imminent research needs. Within weeks, a rapid molecular test was developed to detect this unique Asian H5 high-path AI virus, which allowed quick differentiation from our North American low-path AI viruses.

This test was transferred to the National Veterinary Services Laboratories of APHIS, and is the core test used in diagnostic effort to rapidly identify infected flocks. We conducted studies to understand how the early high-path AI virus is infected and cause disease in birds. In chickens and turkeys, these initial viruses took high-exposure doses that were needed to produce those infections and bird-to-bird contact transmission was very inefficient. But all the infected chickens and turkeys became ill and died.

By contrast, domestic ducks and also mallards, a wild-type duck, became infected with lower doses of the virus and had more efficient contact transmission, but they did not become ill, nor did they die. Subsequent experiments using the later viruses from the Midwest, from Minnesota and Iowa and the Dakotas, found these viruses required less actual virus to infect chickens and contact transmission occurred more easily, thus indicating the later viruses had changed or were more easily transmissible to and among chickens and turkeys.

In extending laboratory data to the field, ARS researchers have teamed up with APHIS virologists and epidemiologists, as well as field and poultry veterinarians at universities by providing some genetic analysis of the high-path AI viruses in order to focus epidemiologic investigations. Genetic analysis support a point source introduction from infected waterfowl to poultry in the Pacific Flyway and in the early Midwestern cases.

However, the later Midwest viruses showed evidence of common-source introductions from outbreaks supporting farm-to-farm spread. In the United States, there is no vaccine approved or currently in use in commercial poultry for high-path AI. While some nations have attempted to utilize vaccine to protect poultry against the H5N1 high-path AI, their use of it as a primary focus through control has not always lead to immediate eradication.

Ninety-nine percent of all high-path AI vaccine has been used in only four countries, China, Egypt, Vietnam, and Indonesia, where the H5N1 virus is endemic. In these countries, their prolonged use of vaccine has been associated with vaccine failure and emergence of vaccine resistance, and this has necessitated continued surveillance for vaccine-resistant strains and periodic change of vaccine seed strains to more closely match those circulating field viruses for more effective control.

In support of APHIS, ARS conducts high-path AI vaccine seed development, and testing is one of our routine research activities. But we do not manufacture vaccines nor decide when or if vaccines should be used in the field. The licensing and the use of vaccine is determined by APHIS. Currently, ARS has developed a new vac-

cine seed strain for use in an inactivated vaccine and is conducting the final protection studies in both chickens and turkeys.

If viable, this vaccine strain will be transferred to a commercial vaccine manufacturer or manufacturers. In addition, ARS is evaluating some registered AI vaccines for protections in chickens and turkeys against the current outbreak viruses.

Vaccination can play a helpful role in disease eradication if it is properly implemented. But globally, vaccination has a negative impact on poultry exports, which is a crucial part of the U.S. poultry industry. Efforts to mitigate the effect of vaccination on exports include identifying infected poultry within vaccinated populations through reliable and cost-effective serological and virological testing. Such a strategy is often called DIVA testing. So development and validation of DIVA-testing strategies for our potential vaccine programs is a high-research priority for Southeast Poultry, and we have those studies underway.

In conclusion, the current HPAI outbreak represents unique and unprecedented challenges to the U.S. poultry industry with ARS and collaborators: first, immediately shifting their research programs to high-priority areas, infectivity and transmission studies in poultry and wild birds; second, rapid diagnostic test development for detecting Asian H5 high-path AI virus; third, molecular epidemiologic studies on virus spread; and fourth, development of efficacious vaccines and an effective vaccination strategy.

Thank you, again, for this opportunity to testify and for Congressional support as we continue to fight this virus.

[The prepared statement of Dr. Swayne follows:]

PREPARED STATEMENT OF DAVID E. SWAYNE, D.V.M., PH.D., DIRECTOR AND SUPERVISORY VETERINARY MEDICAL OFFICER, SOUTHEAST POULTRY RESEARCH LABORATORY, AGRICULTURAL RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE, ATHENS, GA

Chairman Rouzer, Ranking Member Costa, and Members of the Subcommittee, I am Dr. David Swayne, Laboratory Director and Supervisory Veterinary Medical Officer, at the Southeast Poultry Research Laboratory (SEPRL) which is part of the Agricultural Research Service's (ARS) U.S. National Poultry Research Center in Athens, Georgia.

I am sure you are aware of the great hardships that the U.S. poultry industry and producers have suffered because of Highly-Pathogenic Avian Influenza (HPAI). It goes without saying that ARS, and particularly the research staff at SEPRL, are committed to eradicating the H5N8 or H5N2 viruses at the center of the current North American outbreak through cutting edge research in diagnostics, epidemiology, pathology, molecular biology, and vaccinology. ARS is determined to aid our sister agency, the Animal and Plant Health Inspection Service (APHIS), and the poultry industry to ensure that this strain of avian influenza is understood and can be scientifically managed to protect animal agriculture and the food supply.

Background

ARS's Exotic and Emerging Avian Viral Diseases Research Unit at SEPRL has been conducting research on avian influenza since the mid-1970s. Our research has helped U.S. poultry farmers increase exports, led to the eradication of low-pathogenic avian influenza (LPAI) in U.S. poultry, and contributed to the overall global efforts to combat LPAI and HPAI. Today, SEPRL is USDA's national research laboratory for avian influenza and an international reference laboratory recognized by both the World Organization for Animal Health (OIE) and the Food and Agriculture Organization (FAO) of the United Nations. We also work within the OIE/FAO Animal Influenza Expert Laboratory Network (OFFLU) that cooperatively works internationally to control influenza in all agricultural species.

Initial Research Response

In response to the first detections of H5N8 and H5N2 in wild waterfowl and captive raptors in the United States in December of 2014, ARS refocused its HPAI research direction to the most imminent research needs to address the U.S. outbreak. Within weeks, scientists at SEPRL developed a rapid molecular test to detect the Asian H5 HPAI, which would quickly differentiate it from the North American LPAI viruses. The test was quickly validated by researcher at SEPRL for sensitivity and specificity, and transferred to the National Veterinary Services Laboratory (NVSL) of APHIS. In addition, SEPRL developed a rapid test for the identification of the N8 gene of the Asian HPAI viruses and helped NVSL optimize its neuraminidase sequence test.

Infectivity and Transmission

Representative H5N8 and H5N2 HPAI virus strains from the United States were tested in terrestrial poultry, domestic ducks, and captive mallards to determine how easy it was to infect birds and produce disease. The initial HPAI viruses required high intranasal doses of virus to infect chickens and turkeys, and contact transmission to birds was inefficient. However, all infected chickens and turkeys became ill and died. By contrast, the domestic ducks and mallards became infected with lower doses of virus and had more efficient contact transmission. They did not become ill or die, but shed virus into the environment through the feces and oral secretions for up to 14 days.

These studies suggest the early H5 HPAI viruses were best adapted to waterfowl and difficult to transmit from wild waterfowl to poultry. The HPAI virus detections in wild birds from the Pacific Flyway corroborate this observation as detections were observed at an unexpectedly high rate in several duck species, with more limited detection in backyard flocks and only two commercial poultry flocks.

However, the later outbreak of the H5N2 virus in the Midwest required less virus to infect chickens, and contact transmission occurred more easily than with the initial HPAI viruses. This demonstrated that the wild bird viruses had changed and were more easily transmitted to and among chickens and turkeys, potentially allowing for farm-to-farm spread of the virus.

Molecular Analysis of Virus Spread

It is critical in developing control and eradication strategies to understand how the viruses are introduced onto farms and how they spread. SEPRL researchers have been working with APHIS virologists and epidemiologists as well as field and university poultry veterinarians to provide molecular network analysis of the HPAI viruses. The data produced by this analysis supports the idea that the early outbreak viruses were likely introduced by wild birds. However, the analysis of later viruses showed molecular sequence evidence of clustering, which is a sign of farm-to-farm spread.

Vaccine Issues

In the United States, there is no vaccine approved or currently in use in commercial poultry for H5N8 or H5N2 HPAI. While some nations have attempted to utilize vaccine to protect poultry against the H5N1 HPAI virus, a primary focus on vaccines has not led to immediate eradicate of HPAI. Ninety-nine percent of the vaccine use to this point has been in China, Egypt, Vietnam and Indonesia were H5N1 HPAI is endemic.

Issues associated with vaccine use, including vaccine failure and vaccine resistance, have been identified in countries using the vaccine long-term. In addition, vaccine efficacy is limited over time. Similar to human influenza, avian influenza viruses change over time, and vaccine efficacy decreases as the outbreak viruses change. This has necessitated continued surveillance for vaccine-resistant field strains within vaccinated poultry populations of these countries, and periodic change of the vaccine seed strain to more closely match the circulating field HPAI virus for optimal protection. In countries vaccinating against HPAI, virological surveillance in vaccinated flocks is crucial to collect viruses for genetic and antigenic analysis to assess field protection between vaccine seed strains and current circulating field viruses.

ARS plays a critical role with APHIS and other public health authorities in providing scientific information and countermeasures to significantly and measurably mitigate the impact of HPAI disease outbreaks. When addressing the need for vaccination, SEPRL first evaluates new avian influenza outbreak viruses by sequence analysis and serologic characteristics, which provides a good estimation of how close the new viruses are to other influenza viruses and existing vaccines. Then we select the most representative challenge viruses to use in vaccine efficacy and challenge

studies. Because these are HPAI viruses, the studies must be conducted in high biocontainment facilities.

Vaccine and Testing

SEPRL conducts vaccine seed strain development and testing as well as routine research activity, but it does not manufacture vaccines nor decide when or if vaccines should be used in the field. The licensing and use of a vaccine is determined by APHIS. Currently, SEPRL is evaluating registered HPAI vaccines and has developed a H5 vaccine seed strain for protection in chickens and turkeys against the current H5 HPAI outbreak viruses. If viable, the appropriate vaccine seed strain will be transferred to a commercial vaccine manufacturer.

Measuring Efficacy

Vaccine protection or efficacy is measured primarily by two means in vaccinated poultry: (1) prevention of clinical disease and death; and (2) a reduction in virus shedding, which reflects the growth of the challenge virus and release of the virus in body secretions (oral secretions and feces). Decreased virus shedding is important in reducing environmental contamination, and thus reducing virus transmission and infection. Low quality vaccines or vaccines with antigenic mismatches do not prevent infection. Thus birds challenged with a high dose of HPAI virus will become infected and excrete a great deal of virus into the environment.

Vaccination can play a helpful role in disease eradication if properly implemented, but historically vaccination negatively affects poultry exports, which is a crucial part of the U.S. poultry industry. Efforts to mitigate the effect of vaccination on exports include the use of testing that can identify infected birds within a vaccinated poultry population using reliable and cost effective serological and virological testing; *i.e.,* so termed DIVA strategy. This differentiation approach has been shown to work experimentally, but with only limited field experience for HPAI vaccine. SEPRL is evaluating all the vaccines being tested for the ability to identify infected birds within vaccinated poultry. Because of the many types of vaccines proposed for use, some strategies need more research work for development and validation. The validation of this approach is a priority for SEPRL and its collaborators.

Conclusion

The current HPAI outbreak presents unique and unprecedented challenges to the U.S. poultry industry. The widespread presence of HPAI in wild birds provides an ongoing threat to the U.S. poultry industry. That is why SEPRL immediately began to work to identify specific strains of the virus, and develop a test to detect the HPAI virus in affected poultry. In addition, SEPRL continues to work, develop and test an effective vaccine for the specific strains of the virus impacting the U.S. As mentioned before, we are in the initial testing phase for the H5 HPAI strain. While testing looks promising, much more work is needed before a registered vaccine is found to be a viable option.

We will continue to develop new and improved tools for containment of the virus, and work to make these tools commercially available, where possible, as a means to prevent the widespread losses the poultry industry and producers have sustained during this outbreak. The Agricultural Research Service, along with Animal and Plant Health Inspection Service, will continue to work hard to address this complex problem. Thank you again for the opportunity to testify and for Congressional support as we continue to fight this virus.

The CHAIRMAN. Dr. Clifford.

STATEMENT OF JOHN R. CLIFFORD, D.V.M., DEPUTY ADMINISTRATOR, VETERINARY SERVICES, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

Dr. CLIFFORD. Thank you, Mr. Chairman, and Members of the Committee. I would like to thank you again for the opportunity to testify on behalf of the United States Department of Agriculture.

As I sit here today, it has been almost 2 full months since our last detection of high-path AI in Minnesota and about 7 weeks since any detections in Iowa. Over 60 farms have started restocking with new, healthy poultry. Over 30 have finished the

cleaning and disinfection process and are on their way to restocking.

Those numbers will continue to climb in the coming weeks as a positive sign that we are recovering from this devastating outbreak, the largest animal health emergency in our country's history. USDA will continue to stand with those producers helping them to get back into production as quickly as they can.

Much of our effort in recent weeks has been with an eye toward the future. We have been meeting with our state and industry partners to plan for any potential fall outbreaks. We learned a lot from what happened in the spring, and we are taking those lessons, identifying gaps and needs, and revising our plans. I can assure you that we will be ready to face any outbreaks in the fall.

I just came from a conference in Des Moines where we, along with our state and industry partners, discussed the outbreak and steps for the fall. Our conversations there and in previous meetings have identified several key things: First, we all need to improve our biosecurity. It is truly a shared responsibility. We need to wash equipment, limit the number of people on farms, and we need to take steps to limit contact with wild birds. As part of this effort, we need to improve outreach to producers. We have been working with the industry in states to share information and materials so we can be ready to stop disease spread.

Second, we recognize the importance for rapid depopulation of birds. The longer we take to depopulate sick birds, the more virus they produce; and with more virus in the environment, the greater its chances to overwhelm our biosecurity efforts. We are working with our partners on all the logistical challenges, and we need to have the right equipment and materials in the right places and the right disposal options to eliminate any unnecessary delays.

Third, we need to continue to have discussions about the vaccine policy. We have made the decision to stockpile vaccine but have not decided whether or not to use it to control disease spread. Our discussions with trading partners to date suggest that many of them would ban all poultry exports until they could complete a risk assessment.

We will continue to actively engage these partners about how to minimize the effects on trade should we need to use vaccine in the future. But if we want the conversation and attitude of our trading partners to change, it is likely that all of us will have to change some of our policies and concerns about the use of vaccines for high-path AI and other foreign animal diseases.

We are planning for a worst-case scenario, and we will be ready for it. While I don't think it will come to that, this planning is important to ensure that we can handle any potential outbreaks in the fall no matter the size. To that end, we are adding additional staff, over 450 term positions, including 210 animal health technicians, and 90 veterinary medical officers. We are working with our Federal and state partners to increase surveillance of wild birds which brought the disease here initially.

Close monitoring of wild birds let us identify and respond to this disease as a rapidly as possible. Our hearts go out to everyone affected so far, producers, their employees, and the communities they live in and support. And we are making sure we are doing every-

thing we can to help those who may be possibly affected in the months ahead.

Mr. Chairman, this concludes my testimony, and I would be happy to answer any questions you or the Members of the Subcommittee may have. Thank you.

[The prepared statement of Dr. Clifford follows:]

PREPARED STATEMENT OF JOHN R. CLIFFORD, D.V.M., DEPUTY ADMINISTRATOR, VETERINARY SERVICES, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.

Chairman Rouzer, Ranking Member Costa, and Members of the Subcommittee, thank you for the opportunity to testify today on behalf of the U.S. Department of Agriculture (USDA). I serve as the Deputy Administrator for USDA's Animal and Plant Health Inspection Service (APHIS). In this capacity, I am the Chief Veterinary Officer of the United States.

Today, we are facing the largest animal health emergency in this country's history. We are dealing with an unprecedented outbreak of highly-pathogenic avian influenza (HPAI) that is taking a heavy toll on the poultry industry. People have lost their jobs and have seen their livelihoods put in grave danger by this outbreak, and our hearts go out to them. I can assure you, however, that this disease has USDA's fullest attention, and we are committed to standing with our producers and industry to get them—and the communities they live in and support—back on their feet.

USDA has been and will be there every step of the way with producers, industry, and our state partners. We've worked closely with them to respond quickly and decisively to this outbreak. More than 400 USDA staff and nearly 3,000 USDA-contracted personnel have been working around the clock in every affected state on the response. We've delivered over $190 million in indemnification payments to producers to control the spread of disease, and to help them recover from it. Should the need arise, we have the authority to request even further funding. All told, USDA has committed over $700 million—an amount more than ½ of APHIS' yearly discretionary budget—in addressing this outbreak. We've seen trade cut off by trading partners concerned about the devastating effects of this disease, causing over $1 billion in poultry products to be directed to other markets at a cost to producers. We understand the devastating impact this outbreak has had upon all, and we are committed to helping those affected. And we will help protect those producers who have not yet been—and we certainly hope, will not be—impacted by this disease.

The Outbreak

The outbreak started in December 2014. Western Hemisphere migratory birds commingled with Asian birds in the northwestern part of the continent. These birds acquired a variant of HPAI that is currently widespread in Asia. Wild ducks and geese (which have lower mortality for this variant) brought the disease first to the Pacific flyway, and later to the Central and Mississippi flyways. Initial detections in the United States were in wild birds and backyard flocks, and may have resulted from direct contact with sick migratory birds. As the virus spread through the Midwest, it came into contact with some of the largest segments of the poultry industry; it took an especially heavy toll on turkeys and egg-laying chickens, primarily in Minnesota and Iowa.

APHIS scientists have been conducting an epidemiological investigation into the origins of the disease. Based upon the results of the preliminary investigation the agency released in June, we believe wild birds were responsible for introducing HPAI into the environment, and from there it was spread into commercial poultry houses. However, given the number and proximity of farms affected by HPAI, it appears the virus is spreading in other ways as well. For instance, one analysis provides evidence that a certain cluster of farms was affected by identical viruses, pointing to possible transmission among those farms. In addition, genetic analyses of the HPAI viruses suggest that independent introductions as well as transmission between farms are occurring in several states concurrently.

Our investigation shows that the virus has been introduced into commercial poultry facilities from the environment (*i.e.,* water, soil, animal feces, air) or from farm-to-farm transmission on human sources such as boots or equipment. After conducting an analysis of over 80 commercial poultry farms, APHIS cannot associate transmission of the disease with any single one of those factors, but it seems clear that lateral spread occurred when biosecurity measures that are sufficient in ordi-

nary times were not sufficient in the face of such a large amount of virus in the environment.

USDA—through the APHIS National Veterinary Services Laboratories—has confirmed HPAI in 21 states, which includes nine states where we identified it in commercial poultry. We have confirmed the disease in 232 total poultry premises, with 211 of those being commercial facilities. As part of our disease control strategy, we've depopulated 7.5 million turkeys and 42 million chickens and pullets. This is approximately 3% of the U.S. annual turkey production, and approximately 10% of the egg-laying chicken population.

USDA's Response to HPAI

USDA has extensive experience in responding to animal disease outbreaks, especially in poultry. In 2003 and 2004, we successfully fought off an outbreak of Exotic Newcastle Disease in the southwestern United States and low-pathogenic avian influenza, which spread through the Shenandoah Valley in Virginia. The bulk of our response to the current outbreak has been based upon the existing USDA avian influenza response plans we've developed and refined over the years. These existing plans have allowed USDA and its state partners to respond quickly and decisively to address this outbreak using the authorities given to us under the Animal Health Protection Act and state laws and regulations.

The goals of USDA's HPAI response plans are to (1) detect, control, and contain HPAI in poultry as quickly as possible; (2) eradicate HPAI using strategies that seek to protect public health and stabilize animal agriculture, the food supply, and the economy; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products. In addition we want to ensure that the Federal Government, producers, states and local governments are well-positioned to effectively respond to future outbreaks. Achieving these goals will allow individual poultry facilities, states, Tribes, regions, and industries to resume normal production as rapidly as possible and minimize losses from future outbreaks. They will also allow the United States to regain disease-free recognition from our trading partners without the response effort causing more disruption and damage than the disease outbreak itself would be were it left unchecked.

The plan has five basic steps when the disease is detected: quarantine, eradicate, monitor, disinfect, and test.

- *Quarantining* allows us to restrict the movement of poultry and poultry-moving equipment into and out of the control area. Simply, we must stop the spread and transfer of the disease as much as we can.
- *Eradication* is part of our "stamping-out" approach to HPAI, which requires the depopulation of clinically affected and in-contact susceptible poultry to eliminate the disease where it exists and to further reduce the risk of spread. USDA has provided indemnification payments to producers for those birds that must be depopulated, which helps serve as an incentive for them to report potential infections quickly, which can further reduce the potential for virus spread.
- USDA *monitors the region* to better understand the viral spread. We monitor birds in a broad area around the quarantine area to see if there are other incidents to which we must respond.
- *Cleaning and Disinfection* of the premises where affected flocks are located is a key piece toward eradication. We must know that facilities are clean and disease-free before we can allow them back into production.
- *Testing* is the last step. After the disinfection is complete and before we can release the quarantine, we test the premises and environment to ensure that it is disease-free, so that operations may safely resume.

USDA has the best avian influenza surveillance system in the world. Our program exceeds international standards and allows us to identify the disease, and upon detection, to ramp up our emergency response activities. Our strong surveillance system assures our trading partners that we take disease eradication and control seriously and will be of great benefit to us as we try to resume trade with the foreign trading partners who have cut off access to U.S. poultry and poultry products.

How This Works for Producers

USDA wants impacted producers to get back into business as quickly as possible, and APHIS and its state partners work very closely with those affected.

Following confirmation of HPAI in their operation, a producer will need to develop a flock plan for all premises with confirmed infections or exposure. The flock plan

sets out the steps to eradicate the virus and prevent its spread to other flocks. It also specifies the procedures required to get the facility back into production, including requirements for quarantine release. The flock plan will include cleaning and disinfection requirements. The flock plan must be signed by the owners, a state animal health official, and an APHIS official before an indemnification payment can be processed. An APHIS case manager will work with the producers to walk them through the process and the information required to complete all steps.

APHIS will then prepare an appraisal document for indemnification and present it to the producer as quickly as possible. Affected producers need to sign the appraisal document before depopulation can occur. The Animal Health Protection Act limits indemnity to the fair market value of the animal being depopulated; our indemnity payments are not intended to make the producer whole, such as by covering production losses during the time a barn is down for the disease response activities. APHIS economists developed a series of species-specific appraisal calculators that use publicly available prices, costs, and productivity data to develop a value per animal that varies by the age of the animal. The calculators are updated monthly to account for changing feed costs, values, and assumptions.

The value per animal type multiplied by the number of each animal type is used to calculate total indemnity. For HPAI, APHIS provides 100 percent of that indemnity amount. One important distinction: the Animal Health Protection Act limits indemnity to the fair market value of the animal being depopulated.

A compliance agreement must be developed if depopulation, disposal, or cleaning and disinfection will be performed by personnel other than Federal or state officials, and if the producers will request indemnity for those activities. A compliance agreement is separate from the flock plan. The flock plan specifies the necessary procedures for the premises to resume normal production; a compliance agreement indicates what tasks will be completed, who will be responsible for each task, and how much the work is expected to cost. A compliance agreement is comparable to a statement of work—a plan that lays out the activities to be done and the expected costs to accomplish those activities.

Provided the terms of the compliance agreement are met, USDA will provide funding for those cleaning and disinfection activities, and compensation or indemnification for any items or equipment that are destroyed or damaged as a result of the cleaning and disinfection process.

The Importance of Biosecurity

One of the lessons we've learned is that we all need to be vigilant about maintaining stringent biosecurity measures, especially in the face of a disease outbreak. In June, APHIS released a partial epidemiology report on the Agency's findings about the origins and spread of the virus. While the results of our preliminary epidemiological investigation didn't show a single source of transmission, it did emphasize the importance and need for improved biosecurity. The strength of our biosecurity efforts depends entirely on all of us—producers, their employees, USDA, and our contractors who are responding to this outbreak.

Part of this involves more outreach to producers. We've made more information about basic biosecurity practices available on our website, and we've shared materials such as a checklist of best practices and information sheets with industry groups for distribution to their members. These recommendations include items such as allowing only essential personnel access to poultry premises and thoroughly disinfecting boots, equipment, and vehicles that enter and exit those locations.

We're also meeting directly with State Veterinarians and industry to discuss the need for more biosecurity. On July 28 and 29, 2015, we held a stakeholder meeting with those groups to discuss those issues to ensure that our collective biosecurity is more stringent and that we are prepared for any future outbreaks. We also participated this week in an industry-sponsored meeting in Des Moines, Iowa to talk about the importance of our shared biosecurity responsibilities, as well as to stress the importance of proper planning for the fall.

We know that proper biosecurity begins at the farm's edge. What this outbreak has taught us is that the biosecurity measures that extend on the farm into each individual barn or facility are equally or, at times, more important than the farm's edge approach. Based on the belief that "an ounce of prevention is worth a pound of cure," we plan to work with our producer and state and local partners to strengthen biosecurity measures. This may require changes to current practices or assumptions, and USDA is engaging our partners in these critical issues.

APHIS appreciates the cooperation of poultry producers in providing the information needed for these epidemiology investigations. APHIS values its partnership with industry and believes that with their continued support and assistance, the agency will be well positioned to learn all it can about this virus. We all have a

role in—and a responsibility for—our nation's agricultural health, and we will work together to ensure that we are in the best position possible to address this disease.

Preparedness for the Fall

USDA is treating the potential threat of more infections in the fall with the utmost seriousness. Although we hope that we will not have additional or more widespread outbreaks, it's very likely that wild birds will carry the virus with them when they begin migrating south in the fall. Although states in the Atlantic flyway have not been affected by this HPAI outbreak, it's important that our state and industry partners begin preparations should the disease occur there.

I can assure you that this need for preparedness has the attention of all of USDA. The Secretary is leading these efforts, and has directed USDA to do everything it can to respond to this virus, assist producers, and maintain trade markets. As we look to the fall, we plan to be ready for the challenge.

To that end, we recently concluded a planning workshop with our partners focusing on the worst-case scenarios and the responses needed. We're identifying the resources we would need under various scenarios and how we can better partner with states and industry to manage this disease.

We've encouraged our partners to review the existing avian influenza response plans so they understand what we will expect and what actions we will need them to take should the disease strike. Along those lines, we've urged states and industry to develop site- and county-level specific depopulation plans for landfilling or composting birds. Our experience in the Midwest showed that the biggest roadblock to efficient depopulation (which is key to reducing the spread of the virus) is the lack of ready sites to receive and process dead birds.

Should the disease strike in the fall, USDA and its partners will be ready to tackle it head-on.

Vaccination and Trade Issues

As part of USDA's ongoing response, the Department evaluated the efficacy of current vaccine options for HPAI in addition to the economic impacts of vaccination. Some in the poultry industry asked if USDA would consider allowing the emergency use of vaccines to halt the spread of the disease. In June, after conducting that evaluation, USDA determined that we would not, at this time, allow for the use of vaccines to assist in the eradication of HPAI.

Right now, we do not have a closely matched vaccine to the outbreak H5N8 or H5N2 HPAI viruses. USDA's Agricultural Research Service (ARS) is evaluating a current vaccine in chicken and turkey protection studies against our specific outbreak viruses. In addition, ARS has developed a reverse genetic H5 vaccine seed strain that antigenically matches the field virus and it is undergoing the same protection studies. Only the most efficacious vaccines should be considered for field use as any infection in the vaccinated population would still require the entire barn to be depopulated.

Aside from questions about its effectiveness, USDA believes that if a vaccine were used, some additional trading partners would ban all U.S. exports of poultry and eggs and not necessarily just those from the states currently affected by HPAI until they could complete a full risk assessment. The loss of these markets could cost U.S. producers at least $3 billion in trade revenue with uncertain reductions to the mortality rate of birds from this disease.

In the weeks and months ahead, we will continue to support efforts to develop more effective vaccines. ARS scientists are working diligently on a better vaccine based on the specific genetics of this strain of the virus. We have said that we may reevaluate our vaccination decision as more effective vaccines are developed and ready for use, carefully considering both the efficacy of the vaccine and the potential trade impacts. If used, vaccines will serve as an additional tool in our eradication efforts and will be targeted in the states and poultry sectors where they can be most effective.

USDA has been working very closely with our trading partners to minimize the effects of this outbreak on producers. The World Organization for Animal Health (OIE) guidelines encourage a regionalized approach to animal diseases, and we have urged our trading partners to adopt that approach, just as we would with them should they be struck by an animal disease. Despite the OIE guidelines, 18 trading partners have suspended imports of all U.S.-origin poultry and poultry products. However, 38 trading partners have adopted a regionalization approach, limiting imports of poultry and poultry products only from those states or counties affected. We speak with our partners regularly, and are already working with them to restore market access from the areas where the outbreak was limited and has been con-

trolled. We'll continue to work with them to restore full market access as quickly as possible as the overall outbreak subsides.

Conclusion

There are a few key points I want to leave you with. There have been no human infections from these viruses and the risk to the general public is low. It's also important to understand that our food supply is safe. Properly prepared and cooked poultry and eggs are safe to eat.

I think despite the difficulties we've faced, we've had some good news. We have not had a single detection of the disease since June 17, well over a month ago, and 60 farms are eligible to repopulate with new poultry. The restocking guidelines we and our state partners have put in place give us the assurance that the premises and the local environment are free from the disease, and that we have enhanced biosecurity measures in place to reduce the threat of re-contamination. Most importantly, successful restocking is a sign that our techniques and approaches in confronting this disease can and do work. That might not seem like much consolation for the producers who've lost so much, but it should provide reassurances to those nervous about the potential approach of the disease through wild waterfowl come fall.

I really want our producers to understand that they have USDA's support. Our experience in quickly and successfully responding to previous animal disease outbreaks and the lessons we've learned from the Spring on this outbreak will inform our response and allow us to minimize the effects of this disease, going forward. Every day, we are further refining our prevention, detection, and response based on the latest science and the lessons from this outbreak. We will continue sharing what we learn with our state and industry partners through regular conversations and meetings. We will also continue to work with Congress to ensure that we have the necessary tools and resources to fight this disease. Together, we will meet this challenge and protect the health of the nation's poultry.

The CHAIRMAN. Thank you very much.

Dr. Meckes.

STATEMENT OF R. DOUGLAS MECKES, D.V.M., STATE VETERINARIAN, NORTH CAROLINA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, RALEIGH, NC

Dr. MECKES. Yes. Chairman Rouzer, Ranking Member Costa, Members of the Livestock and Foreign Agriculture Subcommittee, I am Dr. Doug Meckes. I am the State Veterinarian in North Carolina and the lead for the veterinary division in the North Carolina Department of Agriculture and Consumer Services. Thank you for the opportunity to be here today to speak to our efforts to prepare for and to respond to highly-pathogenic avian influenza should it come our way this fall.

First and foremost, please understand that in North Carolina the department has approached this task knowing that appropriate response is beyond the scope of any single entity in state government. From the beginning of the endeavor, we had fully embraced our colleagues in the department and in particular the staff of the emergency programs division, which includes both emergency responders and veterinarians who are uniquely qualified through their training and experience to address this disease.

In addition, we have aligned ourselves with the department's environmental programs leads, who serve as the liaison with the Soil and Water Conservation Division in the Department of Environment and Natural Resources. North Carolina's diverse topography from the mountains to the coast necessitates consideration of environmental impacts of every aspect of response activity should we experience unprecedented mass mortality.

Other partners in the department—Marketing, Forestry, and Food and Drug Laboratory—have also been included to varying de-

grees. Outside of the department, we have engaged with the poultry industry, our Federal partners, North Carolina State University, the cooperative extension service and state emergency management in our efforts to assure a unified approach to the potential for disease outbreak.

The department's efforts for preparedness began in earnest after requests for disease management assistance were received from Minnesota in March. We immediately responded and deployed depopulation teams to support Minnesota's efforts. And during the early April period, the Midwest experienced a blowup in premise numbers of infected with the avian influenza virus and existing resources were overwhelmed, leading to a backlog in disposal efforts.

During two additional deployments, North Carolina response teams traveled to Minnesota and to Iowa and, again, assisted the state's response team in depopulation of infected birds. Recent reports indicate that the presence of this backlog of infected birds contributed to the lateral spread of the virus in several areas, but by the time our teams returned to North Carolina, that backlog had been managed.

These deployment experiences were the cornerstones for our preparedness efforts in North Carolina. And over the past 3 months, we have established work groups to address many of the lessons learned during deployments. Those groups include operations, biosecurity, laboratory capacity, disposal, decon, and disinfection, communications, outreach, and permitting. Internally, the Emergency Programs Division, the Veterinary Division, and the Environmental Programs staff are fully engaged in every aspect of these working groups.

Our external partners are also participating in each of those areas. Three particular areas are deemed critical and effective timely management of disease outbreak, operations, particularly depopulation, biosecurity, and disposal. As previously noted, the delay in depopulation contributed to the lateral spread of the virus in the Midwest. We are determined that will not be the case in North Carolina.

The department has long conducted training sessions for staff and others in the use of North Carolina foaming equipment, typically twice a month in the eastern and western parts of the state. More recently, the department conducted foam training for industry partners on 2 successive days and held three regional meetings in the eastern, central, and western North Carolina for industry and agency partners to discuss preparations for a robust response to high-path avian influenza.

In addition, our marketing division and Commissioner of Agriculture Troxler have solicited funding from our industry partners for construction of ten additional units. Once these units are completed, North Carolina will have 16 foam units available, ten of which will be fully manned and ready for deployment in the event of disease outbreak. The department has also worked with our colleagues in forestry to rent fire trucks with foaming equipment suitable for use in depopulation activities.

While delays in depopulation are believed to have contributed to the lateral spread of a virus, of equal significance and consequence are the breaches in biosecurity that have been documented by

USDA. Suffice it to say, all would be well served to implement more stringent biosecurity procedures. Our goal in North Carolina is no lateral spread. And to accomplish this, the biosecurity lead on each of our response teams will seek to ensure compliance with biosecurity protocols by our team members, by all grower staff, and all movements on and off premises.

Since North Carolina grower facilities are typically in much closer proximity to one another than in those states which have already been affected, there is greater need for comprehensive biosecurity practices to reduce the spread of high-path AI. Consider, for example, that in some identified 10 kilometer control areas in North Carolina we have over 500 individual poultry houses contained within that perimeter.

Disposal is the third critical tenet of the department's response effort, and given constraints on burial throughout of North Carolina and the limitations on landfill and rendering facilities, composting is the first choice for management of poultry carcasses as has been the case throughout the Midwest.

Finally, the economic impact of catastrophic mass mortality disease outbreak could have profound implications for counties, and for the state. The North Carolina poultry industry is responsible for as much as $34 billion in total economic activity and creates and supports as many as 109,000 jobs.

North Carolina has a longstanding commitment to agriculture and has responded to and recovered from agriculture disasters in the past: Drought, disease, and weather events. But high-path AI's unprecedented in its potential to impact our state and the entire Southeast.

The department and its partners are committed to preparing for and responding to this disease should it arrive on the wings of migratory birds this fall, and we are at the ready to quickly and effectively manage the disease to the best of our ability. If successful, we will minimize the impact on North Carolina poultry industry, on its growers, on our economy, and the citizens of our state.

I am prepared to answer any questions you might have.

[The prepared statement of Dr. Meckes follows:]

PREPARED STATEMENT OF R. DOUGLAS MECKES, D.V.M., STATE VETERINARIAN, NORTH CAROLINA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, RALEIGH, NC

Chairman Rouzer, Ranking Member Costa, and Members of the Livestock Subcommittee:

Thank you for the opportunity to speak to you about the ongoing efforts of the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) to prepare for and to develop capability to respond to Highly-Pathogenic Avian Influenza (HPAI). First and foremost, please understand that in North Carolina, the Department has approached this task understanding that appropriate response is beyond the scope of any single entity in state government. From the beginning of this endeavor, the Veterinary Division has fully embraced our colleagues in the Department, in particular the staff of the Emergency Programs Division which includes both emergency responders and veterinarians who are uniquely qualified, through their training and experience, to address this disease. In addition, we have closely aligned ourselves with the Department's Environmental Programs lead who serves as the Department's liaison with the Soil and Water Conservation Division. We have also engaged colleagues within the Department of Environment and Natural Resources (DENR), including Solid Waste, Air and Water Quality and Confined Animal Feeding Operations Specialists. North Carolina's diverse topography, from the

mountains to the coast, necessitates consideration of environmental impacts of every aspect of response activity should we experience unprecedented mass mortality.

Other partners in the Department—Marketing, Forestry, and the Food and Drug Laboratory have been included in varying degrees as well. Outside of NCDA&CS, we have engaged with the poultry industry, our Federal Partners, North Carolina State University, the Cooperative Extension Service, NC Department of Labor, NC Department of Transportation, NC Public Health and State Emergency Management in our efforts to assure a unified approach to potential disease outbreak. NC Emergency Management has agreed to handle all HPAI logistical support at the state and local level.

The Department's preparedness efforts began in earnest, after requests for disease management assistance were received from the state of Minnesota in March; we immediately responded and deployed depopulation teams to support Minnesota's efforts. During the early April period, the Midwest experienced an unprecedented increase in numbers of HPAI-infected premises. According to the State Veterinarian of Minnesota and USDA officials, existing resources were overwhelmed, leading to a backlog in depopulation and disposal needs.

During three additional deployments, North Carolina response teams traveled to Minnesota and Iowa to assist those states in the depopulation of infected birds. Recent USDA epidemiological reports indicate that the presence of this "backlog" of infected birds contributed to the lateral spread of the virus in several areas; however, by the time of our team's return to North Carolina, the "backlog" of infected birds had been managed.

These deployment experiences became the cornerstones for preparedness efforts in North Carolina. Over the past 3 months, we have established Work Groups to address many of the lessons learned during deployments. Those groups include: operations, biosecurity, laboratory capacity, disposal, decontamination and disinfection, communications, outreach and permitting. Internally, the Emergency Programs Division, the Veterinary Division and Environmental Programs staff are fully engaged in every aspect of the Working Groups; our external partners are also participating in each of these areas.

The Laboratory Capacity group is collaborating with the North Carolina Veterinary Laboratory Diagnostic System's four state laboratories which will be a critical component in the response efforts. These facilities provide the first line of defense and have the capability to diagnose highly-pathogenic avian influenza virus and perform tests required for movement of poultry to maintain the flow of commerce. The Communications Group developed messaging early in the process to ensure consistent information to the public; that information is posted on the NCDA&CS web site and is available for public reference. The Outreach group has worked across a spectrum of players to ensure timely release of information. Significant amongst this group is the State's Cooperative Extension Service; they are "on the ground" on a daily basis and have close working relationships with both small and large producers and back yard poultry owners. North Carolina also reached out early to special avian collections and created an annex to our HPAI Response Plan. Special Avian collections include birds of special value due to their endangered status or exotic birds on display to the public such as those in the NC Zoo in Asheboro.

Four working Groups have been focused on specific operational aspects of response, to include Biosecurity, Depopulation, Disposal and Decontamination. These working groups include a variety of subject matter experts.

As previously noted, the delay in depopulation is believed to have been significant to the lateral spread of the virus in the Midwest. We are determined that inadequate depopulation capability will not cause similar problems in North Carolina. The Department has long conducted training sessions for staff and others in the use of our North Carolina foaming equipment, typically twice a month, in the eastern and the western part of the state. More recently, the Department conducted Foam Training for industry partners and interested parties from other states on 2 successive days. Three Regional Meetings (eastern, central, and western North Carolina) were held for industry and agency partners to discuss preparations for a robust response to HPAI emerging from the Atlantic flyway this fall.

Breaches of biosecurity documented in the current United States Department of Agriculture (USDA) *Epidemiologic Report* are believed to have contributed to lateral spread of the virus. During response activities, Animal and Plant Health Inspection Service (APHIS) personnel observed sharing of equipment between infected and non-infected farms, employees moving between infected and non-infected farms, lack of cleaning and disinfection of vehicles moving between farms, and rodents or small wild birds inside poultry houses. APHIS is compiling their observations and will present those findings in a final report. Stringent biosecurity will be paramount to preventing lateral spread.

Our goal in North Carolina is "No Lateral Spread" and to accomplish this, the Biosecurity lead on each positive farm will ensure compliance with biosecurity procedures by our team members, all grower staff, and for all movements on and off the premise.

Since North Carolina grower facilities are typically in much closer proximity to one another than in states which have already been affected, there is a greater need for comprehensive biosecurity practices to reduce the risk of HPAI spread. Consider, for example, some identified 10 kilometer Control Areas in North Carolina's Animal Health Data Base have over 500 individual poultry houses within the perimeter. Given that all movement between farms and within farms need to be conducted under the assumption that the disease may be present, the biosecurity mechanism is monumental, but doable.

Disposal is another critical tenet of the Department's response effort. Given constraints on burial throughout much of North Carolina and limitations on landfills and rendering facilities, composting is recommended as the first choice for management of poultry carcasses as has been the case throughout the Midwest. The compost disposal method is also a preferred biosecurity measure in that no diseased birds need to leave the farm. Rapid establishment of mortality compost windrows on site is key to disposal of birds and inactivation of the influenza virus. Timely and effective composting also aims to minimize "down time" for the impacted farms to the extent possible.

The Disposal Work Group is actively pursuing the identification of various carbon sources across the state that are of appropriate type and of sufficient quantity to develop effective compost recipes on each infected premise. The Work Group is also in the process of developing guidance for land application of finished compost for agronomic use as a soil amendment with "fertilizer" value. Additionally, the Workgroup has planned a composting demonstration associated with Commissioner Troxler's annual Food Safety Forum in August. The Department's Incident Management team will create a working "mortality compost pile" near the meeting location for growers from around the state to attend.

Finally, the economic impact of a catastrophic mass mortality disease outbreak in North Carolina could/would have profound implications for counties, regions, and even the entire state. The North Carolina poultry industry is responsible for as much as $34 billion in total economic activity and creates/supports as many as 109,000 jobs. For each $100 million loss in North Carolina poultry farm and poultry processing industries, total state spending falls by $230,000 million, total income in the state falls by $68.8 million, total labor earnings fall by $44.6 million and total employment falls by 1,010 jobs. We've already seen that Minnesota and Iowa have realized a $1 billion economic loss associated with HPAI infection on 180 premises. As many as 500 premises nationwide could be affected this fall.

North Carolina has a long-standing commitment to agriculture and has responded to and recovered from agriculture disasters in the past—drought, disease and weather events, but HPAI is unprecedented in its potential to impact our state and the entire Southeast. The North Carolina Department of Agriculture & Consumer Services and its partners are committed to preparing for and responding to HPAI, should it arrive on the wings of migratory birds this fall, and we are at the ready to quickly and effectively manage the disease to the best of our ability, incorporating the latest USDA lessons learned. If successful, we will minimize impact on the North Carolina poultry industry, its growers, our economy, and the citizens of our state.

I am prepared to answer any questions you might have.

The CHAIRMAN. Thank you, very much.

Dr. Hartmann.

STATEMENT OF WILLIAM L. HARTMANN, D.V.M., EXECUTIVE DIRECTOR AND STATE VETERINARIAN, MINNESOTA BOARD OF ANIMAL HEALTH, ST. PAUL, MN

Dr. HARTMANN. Mr. Chairman and Members of the Committee, my name is Bill Hartmann. I am the Executive Director of the Board of Animal Health and the State Veterinarian in Minnesota. I want to thank you for providing me with an opportunity to testify to this group on the outbreak of high-path avian influenza that we had in Minnesota.

First, I wanted to thank Congressman Peterson for his efforts in Minnesota and for his support during this event.

I also wanted to acknowledge John Clifford and the USDA for what they have done in Minnesota. Our success depended on them being there, and we really appreciate the help that we have received from them. At one point, there were 140 USDA employees working on high-path AI in Minnesota.

It is an understatement to say that high-path AI in Minnesota has been devastating and extremely difficult for all involved. A University of Minnesota study estimated the losses to the economy of Minnesota at $650 million and that was a few weeks ago. The hardest part of this disease has been to see the emotional impact this disease has had on those growers who have affected farms and on the whole industry in Minnesota.

Why Minnesota was so affected, a few reasons: One, we are the Land of 10,000 Lakes and so we have a lot of migratory waterfowl that stop in Minnesota. We produce more turkeys than any other state in the United States, and there is a concentration of those turkey farms in the west central part of Minnesota. And last, the weather was right. It was nice and cool and damp in Minnesota during the spring and that is what the virus likes.

The outbreak started on March 4, and we haven't had any new cases, as Dr. Clifford said, since June 5. So we have gotten a break this summer. And, as Dr. Clifford said, we are making great progress in recovering. There was a 3 week gap between the first case we had and the second case, but then after that we had cases almost every day.

And at the height of the outbreak we had eight cases; that is eight farms that were found affected in 1 day. This included farms that are relatively large in size. We had a turkey farm that had 310,000 turkeys on it and a chicken layer operation that had over two million birds in the facility.

During the course of the outbreak, over nine million birds died or were depopulated to prevent the spread of the virus. Minnesota has extensive experience with low-path avian influenza. We have had that disease just about every year since I have been there. The difference is that that virus doesn't kill birds; it rarely makes them sick, but we still want to make sure that we respond to it.

Working together with USDA, we followed the guidelines that USDA has outlined for eliminating this disease. All 110 farms were quarantined, appraised, and depopulated. After depopulation, turkeys were composted in the barns, and when that compost material was taken out of the barns, the barns had to be cleaned and disinfected, which is quite a job, and then the environment has to be tested before we can release quarantine on the farms.

Neighbors with poultry had to be identified and tested, and during the outbreak we tested over 1,000 flocks for high-path AI. Over the last 10 years, USDA funded development of a scientifically-based permitting system to allow for movement of poultry and poultry products in control areas during a high-path AI outbreak.

Fortunately, they did this because the economic impact could have been much greater if we hadn't been able to move poultry and poultry products out of these control zones. As a matter of fact,

Minnesota issued 6,000 permits for movement of poultry and poultry products within Minnesota and out of Minnesota.

We are working hard with our partners to get all the affected farms back in business as usual. Of the 110 farms that were quarantined and depopulated, 49 are no longer classified positive, 38 have restocked, and eight have been released from quarantine. All of the control zones have been eliminated, so we no longer are required to do this permitting because all those control zones have been taken care of.

What did we learn from this outbreak that we might share with other states in preparation for the fall? It is very important to develop relationships before a crisis, with not only the state, Federal Government, but also local government. We need to prepare and train. We need to be able to depopulate farms within 24 hours. We need to identify a facility in the area where poultry are raised in the state where we can establish an emergency operation center.

We need to make sure that our laboratories have adequate capacity to handle the incredible demands that are made of that laboratory to run tests. All poultry farms should have an emergency carcass disposal plan.

And finally, a new level of biosecurity is going to be required to deal with this virus. We are doing these things in Minnesota, and we are sharing our lessons learned with other states.

Thank you.

[The prepared statement of Dr. Hartmann follows:]

PREPARED STATEMENT OF WILLIAM L. HARTMANN, D.V.M., EXECUTIVE DIRECTOR AND STATE VETERINARIAN, MINNESOTA BOARD OF ANIMAL HEALTH, ST. PAUL, MN

Background

The Minnesota Board of Animal Health (Board) is the lead state agency for emergencies involving domestic and foreign animal diseases. When the first case of Highly-Pathogenic Avian Influenza (HPAI) was found in Minnesota, the Board took the lead in responding. The Board has a Memorandum of Understanding with the Minnesota Department of Agriculture (MDA) to support the Board in the event of a foreign animal disease because such a situation requires resources beyond what the Board has available. So as we found more infected farms we enlisted the assistance of MDA using the incident command structure. Eventually the outbreak exceeded the capacity of Minnesota to respond and we requested an incident management team from USDA:APHIS:Veterinary Services. On April 23, 2015 Governor Dayton declared a peace time emergency. This emergency declaration allowed for the State Emergency Operations Center to be activated and provided access to all of the state government's assets. Other agencies that assisted in the response include the Minnesota Departments of Health, Natural Resources and Public Safety and the National Guard.

Minnesota Poultry Industry

Minnesota is ranked number one for turkey production. The state's 450 turkey farmers raise approximately 45 million birds annually on 600 farms, bringing more than $600 million in income for farmers, processors and other related industries. Minnesota has more independent turkey farmers than any other state in the U.S. Many of these farmers are third, fourth and even fifth generation family farmers. As the nation's largest producer and processor of turkey, Minnesota is home to three turkey processing companies with a total of seven processing plants around the state. The state is also home to the largest turkey hatchery company in the world. Every Minnesota turkey generates $17.46 of direct economic activity to the state, providing $807 million in economic impact. The turkey industry also is responsible for 6,000 direct jobs in on-farm and processing activities. The majority of turkeys raised in Minnesota are more likely to be shipped outside the state.

- Ninety (90) percent of turkey products processed in state are exported out of Minnesota.

- Of that 90 percent, approximately 15 percent are exported to international markets.

Minnesota's egg farmers currently rank number 8 for egg production in the U.S. Farmers care for approximately 11 million egg-laying hens and produce about 2.9 billion eggs annually. The production value of Minnesota's egg industry is approximately $170 million, and accounts for over 2,900 jobs. Minnesota's broiler chicken farmers raise 47 million birds on an annual basis, with an economic value of $123 million. Processing activities add $19 million to the value of broilers produced in Minnesota, and the industry contributes 1,300+ direct jobs on farm and in processing.

The Outbreak

It is an understatement to say that HPAI in Minnesota has been devastating and extremely difficult for all involved. The outbreak in Minnesota started on March 4, 2015. This first case was in a turkey breeding facility. Increased death loss led to samples being tested for HPAI at the Minnesota Veterinary Diagnostic Laboratory. The test was positive and samples were sent to the National Veterinary Services Laboratory for a confirmatory diagnosis. By the time a diagnosis was made all but a few of the 20,000 turkeys in the affected barn had died. The owner did not receive any compensation for the dead birds. There was a 3 week break between that first case and the second case. After that there were one or more new cases almost every day. On the worst day, there were eight new cases. At the height of the outbreak we had 110 farms quarantined in 23 counties. This included a turkey complex with 310,000 birds and a chicken layer complex with over two million birds. Over nine million birds have died or were depopulated to prevent the spread of this virus. The hardest part of this disease has been to see the emotional toll it has taken on affected growers and the industry as a whole.

Minnesota's Response

Minnesota has extensive experience in responding to animal disease outbreaks, especially with low-pathogenic avian influenza (LPAI). In the past turkeys were raised outside in Minnesota and exposed to wild waterfowl. This resulted in many cases of LPAI each year in turkeys. Representatives of the poultry industry, the University of Minnesota and the state worked together to develop a prevention, notification and response plan for LPAI. One of the changes made was that most turkeys are raised indoors now. This greatly reduced the number of LPAI cases. Working together with USDA Minnesota has followed the USDA guidelines for responding to HPAI. All 110 farms that were quarantined were appraised and depopulated with the USDA paying indemnity for the live birds. After depopulation the birds were composted in the barns. When the composted material is removed from the barns the barns have to be cleaned and disinfected and finally environmental tests are run before quarantine release.

Neighbors with poultry had to be tested and monitored for the disease (over 1,000 flocks were sampled). A permitting system had to be set up to allow poultry and poultry products to move into, within and out of the control zones around the infected farms. We have issued permits for over 6,000 movements. It was so vital to have a science based, continuity of business permitting system in place prior to this event so that safe poultry and poultry products were able to move. Without this system in place the economic and animal welfare impacts of the outbreak would have been much worse.

Current Status

We are working hard with our partners to get all of the affected farms back to business as usual. As of July 21, 2015 of the 110 farms that were quarantined and depopulated:

- Forty nine are no longer classified as positive,
- Thirty eight have restocked, and
- Eight have been released from quarantine.

In addition, 98 of the control zones (6.2 mile radius around infected farms) have been eliminated. Even though we haven't found an infected flock in 7 weeks we still have over 100 state, Federal and contract people working on the completion of this response.

Lessons Learned

This is the most extensive multi-state animal health emergency we have ever faced. Our response was well coordinated and we worked well with the poultry industry, state and local officials, and USDA. The relationships the Board has built

with key stakeholders over the years greatly assisted in a unified response. The most important lesson learned is that building relationships before a crisis is crucial.

It is also crucial that USDA and all states prepare and train. We need to have the resources necessary to depopulate infected flocks within 24 hours of diagnosis. When this is not done the virus quickly infects more birds which then sheds the virus in large quantities creating a heavily contaminated site, increasing the chance for lateral spread. The needed resources include equipment for depopulation and trained personnel. There should be facilities around the state where you can set up an emergency operations center near where the cases are found. Your laboratory must have enough trained technicians and equipment to manage the increased volume of tests. All poultry farms must have an emergency carcass disposal plan. A new level of biosecurity is also necessary to stop the spread of this virus.

Preparations for the Fall

Having lived through the spring outbreak we understand what is necessary to prepare for the possibility of a recurrence in the fall. We are procuring depopulation equipment adequate to be able to depopulate farms within 24 hours of diagnosis. We are exploring methods to rapidly depopulate large chicken layer complexes. Our personnel are well trained and ready to respond. We have identified a facility in the heart of Minnesota's turkey industry to use as a center of operations that is available to lease for a year. Our Veterinary Diagnostic Laboratory has hired and trained staff to meet the anticipated increase in volume of testing. Funding has been provided to increase the size and capacity of our Minnesota Poultry Testing Laboratory that is close to the poultry operations to supplement the testing of our diagnostic laboratory. We are working with poultry producers to audit their biosecurity and to make sure they have an emergency carcass disposal plan. Several meetings have been held to discuss strategy for the future bringing together industry, academia, local, state, and Federal Government.

Though we know that new challenges may be presented in the months to come, we are ready for and committed to a swift and unified response.

The CHAIRMAN. I would like to thank each of the witnesses very much for their testimony.

We will now go into a round of questions. And I have a few here myself. In fact, we are not going to have the time limit on Members, but I ask Members to try to keep their questions as concise as possible, and I will certainly try to do the same so that we can get through this in a timely manner.

Dr. Clifford, we, in North Carolina, are very fortunate that the virus has not made it into our state or region yet, but it certainly has a potential to come this fall. What outreach is USDA currently doing to prepare states that have not yet been impacted for a potential outbreak?

Dr. CLIFFORD. Thank you, Mr. Chairman.

We have actually had several meetings with the industries and with the states in preparing for this fall. We have actually sent a survey to the states to prepare them and to prepare us to make sure that the states have identified beforehand the necessary needs for disposal of birds in those states, whether it be a landfill, and have plans ready and prepared so that we know exactly where those birds need to be taken or how we plan to dispose of those birds in those states.

In addition, besides our other types of outreach that we have done, we are planning on sending out a survey to the industry itself throughout to address some of the questions that we have for them in making sure that they are prepared.

From all of this outreach and things that we are doing, we are preparing a USDA plan that will be provided to the Secretary of Agriculture and then provided also to our stakeholders across the U.S.

The CHAIRMAN. Are the states being fairly responsive?

Dr. CLIFFORD. Absolutely.

The CHAIRMAN. Dr. Meckes and Dr. Hartmann, both of you covered this to an extent in your testimony, but if you could highlight again any changes that you think would be necessary based on your experience, particularly in Minnesota, that states need to be doing and prepared for?

Dr. HARTMANN. Mr. Chairman, the most important thing that we have all highlighted is that heightened biosecurity. That is something that we think is so crucial to this. And to that end, Minnesota is going to fund a group of poultry veterinarians who are going to go out and visit each of the poultry farms in Minnesota and go over their biosecurity plans with them in detail so that we are prepared to make sure that we are not spreading this disease.

The CHAIRMAN. Dr. Meckes, anything?

Dr. MECKES. Chairman Rouzer, we are quite fortunate in North Carolina in that we have an Emergency Programs Division within our Department of Agriculture. They have long served our state, as I indicated, in a variety of different disasters, from the disease outbreaks, the hurricanes that so frequently befall North Carolina, drought several years ago. So they are keenly attuned to preparedness activities.

And as I indicated, our teams worked with the foaming machines every month for the last 6 years in preparation for what might come to pass. And as a matter of fact, our USDA colleague frequently had to fund the use of foam in North Carolina when we reported our budget on an annual basis through our cooperative agreement.

So I certainly think that we are well prepared. We are looking forward. We are moving toward to be ready to respond this fall.

The CHAIRMAN. Dr. Clifford, I know there is some interest in the poultry industry to form a first responders team of sorts that is already trained to handle these situations and can work with government employees to provide the needed assistance. Is this something that you all are exploring? Are you familiar with this?

Dr. CLIFFORD. So with regards to the first responders, as we prepare for the fall, the first responders have to be able to pass a test, a health exam basically, because of the personal protective equipment. It is very strenuous work in these houses that they are doing, and with that equipment on, with the Tyvek suits, with the type of personal protective equipment that is necessary in these cases.

So yes, we are preparing and the people that we will be bringing on board, the additional 300 field personnel that will be used for this purpose, one of the first things we will do is preparing them and training them on that behalf.

In addition, the contractors that we use, part of that contractual agreement is that they will have had personnel trained as well prior to any outbreak.

And we are able to put systems of 300 to 600 people in a matter of a few days, and about 1,000 within a week on the contracting side. We are also using our National Animal Health Emergency Response Corps, which is private veterinarians basically willing to do work for them too.

We are training or have trained a number of them already and will continue to do that, but our first priority is to making sure our personnel are trained.

The CHAIRMAN. Are you finding that there is any communication or logistical obstacle at all here?

Dr. CLIFFORD. Well, not with this particular issue, *per se,* but, it is a limiting factor. In other words, how many people we can get trained and ready by the fall is, and plus how many people that we have employed. It has been mentioned; we have deployed about 1,100 people during this process on the past outbreak, but that is 1,100 people that probably makes up probably 200 or 300 individuals and many of them have had multiple deployments.

We have four response teams within USDA APHIS Veterinary Services. In a worst-case scenario we are going to be needing probably ten response teams to prepare for a worst-case scenario and maybe even more.

The CHAIRMAN. Outside the current research that is being done on H5N2 and H5N8, what additional research is needed in order for the industry and government to combat this virus long term? Dr. Swayne.

Dr. SWAYNE. Yes. There are other threats around the world besides just the H5N8, H5N2. For example, in Mexico, the south, there is an ongoing H7N3 outbreak in the central part of the country that is a high-path virus. And also throughout a large part of the country there is a low-path H5N2. So those are continual threats that could enter the U.S. so our laboratory, as part of a global effort to control or eradicate high-path AI works with the Mexican Government on these and we coordinate this research with our partner to the north, Canada.

On research that is needed, there is a wide variety of research that is needed for control programs. Of course, right now, we are highlighting having vaccines prepared and ready to use, but also there is research in other areas, which is maintaining rapid diagnostic tests that are sensitive and specific development of DIVA testing for potential use with vaccines. That would allow us to identify infected flocks within vaccinated populations.

And if we did find infected flocks that are vaccinated, we would have to depopulate those just as if they were unvaccinated. And then also studies looking at the way the virus is transmitted on and off of farms and how to develop mitigation strategies to prevent those transmissions from occurring.

The CHAIRMAN. How is USDA working with the World Organization for Animal Health to develop a policy favorable to vaccine use? What are you hearing there? What has taken place?

Dr. CLIFFORD. Mr. Chairman, the World Organization for Animal Health sets basic international standards on animal health issues, such as avian influenza. The policy and the standards within the World Organization for Animal Health would allow the use of vaccine. It is more the tradition in history of the use of vaccine as being seen as potentially unable to control a disease.

And that is what I was referring to in my testimony. It is the culture of that that we need to move away from. We have what Dr. Swayne has referred to as DIVA strategies, which means that we can distinguish between a vaccine strain and a field strain virus.

And it is those types of strategies that would allow us to reduce the destruction of animals and be able to utilize more the protein. And we need to develop those strategies and implement them worldwide.

The World Organization for Animal Health recognizes that today. It is the countries and some of our own regulations that are, in my mind, I would say, a little outdated, but we are trying to modernize many of those. And such as, right now, today, in some of our own regulations, we wouldn't allow product to come in, fresh product, or hatching eggs or day-old chicks from countries that vaccinate for high-path AI.

Now, vaccine is a tool. It is a tool that we need to use wisely. It is not something you should use consistently and continue, because then its effectiveness is dropped. It is kind of like with the human flu virus, they change that regularly. It is the same thing here. And you would only use it in high-risk areas and only use it when needed during those high-risk times.

The CHAIRMAN. Have any of our top trading partners indicated they will be seeking retaliatory trade measures if we were to start vaccinating commercial birds?

Dr. CLIFFORD. We spoke to a number of our members that we are trading partners with, and basically what they said was, as most of them indicated that still trade with us today and regionalize us today, countries like Japan, they would do a risk assessment first. They would initially shut us off, do a risk assessment. And if the risk they felt was minimal or very low, they would reopen the markets. But that risk assessment can take months.

So the plan is, early this fall, actually in September, late summer, I will be making trips as well as other members of my staff, trips to members of countries around the world to explain to them our specific plans and how we would use vaccine to see if we can get them to accept that and not shut off trade. Because right now, we would be concerned of losing as much as $3 billion or $4 billion in trade annually through the use of vaccine.

I would also like to say those many countries, countries such as South Korea, countries such as China have shut off the entire U.S., and it is not about a vaccine. It is they just won't regionalize us. And so those countries we need to continue to work on that issue and get them to recognize regionalization, which is also well accepted by the OIE, or the World Organization for Animal Health.

The CHAIRMAN. That will conclude my questioning for the time being.

Mr. Costa.

Mr. COSTA. Thank you very much, Mr. Chairman.

Dr. Clifford, just to follow up on your last comment. As you know, we are concurrently undergoing negotiations for the TPP effort with many of these Asian nations and also with Canada, and we have had a problem with Canada on the poultry issue specifically.

One, has the high-path avian influenza impacted Canada, and are they treating it in the same fashion? And number two, are there any attempts by any of these countries to use this as an excuse to invoke non-tariff-like barriers as it relates to our ability to export poultry product. As you indicated, it is a multibillion dollar

industry for the United States, and clearly, we want to do the right thing for the right reasons.

But I remember, in a more recent example, with Mad Cow Disease, we saw certain countries use this not based on best science but as a excuse, in my view, to invoke barriers, even though we were following all the proper phytosanitary protocols.

So could you give me an answer to those two questions. So, one, is this taking place in terms of our negotiations *vis-à-vis* TPP; and two, how has this impacted Canada? And if so, are they treating it appropriately as we are attempting to do?

Dr. CLIFFORD. Let me first address the question with regards to Canada. With Canada and the U.S., we have had a longstanding Memorandum of Understanding or actually an Agreement. It really shouldn't be referred to as an MOU. It is more of an agreement on how we would treat each other relative to these types of issues.

So specifically, on AI, we have had agreement for a number of years now where we definitely regionalize. So Canada and the U.S. really have set the stage in developing a model for other countries to follow. So, yes, Canada treats us very fairly and we treat them the same way, and we do this very quickly based upon the recognition that we both have similar types of animal health systems and the protections of those systems. And so that works very, very well.

And we have actually taken that model in trying to get other countries to adopt something very similar with us. And we have some discussion, actually, with that, with some of our Asian partners as well. With regards to the TPP discussions and non-tariff barriers, I think oftentimes sanitary, phytosanitary issues are raised to a level that are not based on science.

Mr. COSTA. Correct.

Dr. CLIFFORD. And we definitely thought that this is the case with a number of these countries. There are, though, having said that, there are also a number of these countries that have regionalized us and have done it in a complementary way and have supported us.

And, in fact, my friend and counterpart in Japan, Dr. Toshihiro Kawashima, was under a lot of pressure, I know, to shut off the U.S. And he stood with us, and that I much appreciated. In fact, he wants to develop some strategies that we have with Canada between the U.S. and Japan, something we are going to continue to talk about and move forward with.

Mr. COSTA. All right. You might want to provide the Subcommittee with more information on that effort. Let me move back to the domestic front. What has the Department done with the various states to prepare for this fall fly season? And do you think we are adequately prepared for the fall fly season?

Dr. CLIFFORD. I think that we are preparing for that season. I think we are a lot more prepared than we were. But I also think we will be totally prepared before the fly season starts.

Mr. COSTA. And you are talking about regionally, as we talk about the Eastern Flyway and——

Dr. CLIFFORD. I am talking about the entire U.S., sir.

Mr. COSTA. That includes California?

Dr. CLIFFORD. That includes California, yes, sir. Absolutely.

Mr. COSTA. You alluded to in your comments, and, again, we all understand it is a multi-billion dollar industry and we know a lot of flocks that have had to be eradicated as a result of this, a worst case scenario. What is in your mind a worst case scenario?

Dr. CLIFFORD. So we just came through a pretty bad scenario of nearly 50 million birds and 211 commercial premises affected. In our worst case scenario evaluation, it would be 500 cases in commercial flocks and——

Mr. COSTA. Give me the number again, how much have we just, the number that——

Dr. CLIFFORD. Two hundred and eleven.

Mr. COSTA. Two hundred and eleven nationwide?

Dr. CLIFFORD. No. In a worst case—oh, now, today?

Mr. COSTA. Yes.

Dr. CLIFFORD. We had 211 commercial flocks. We had more than that.

Mr. COSTA. Nationwide?

Dr. CLIFFORD. Nationwide.

Mr. COSTA. And you say 500——

Dr. CLIFFORD. Five hundred in ten states.

Mr. COSTA. Is a worst case scenario?

Dr. CLIFFORD. And that is the worst case scenario that we are planning based upon some modeling work we did.

Mr. COSTA. All right. Dr. Swayne, as a laboratory director, do you believe that what we have done in California is a model or applicable elsewhere? Or did we just get lucky?

Dr. SWAYNE. California had some very unique situations that arose. In this case, there was the entry point of the virus through the Pacific Flyway. And studies that we had done in our laboratory clearly showed a couple of things.

One is that virus that came in was highly adapted to migratory waterfowl but was not highly adapted to chickens and turkeys. So transmission farm to farm was much more difficult. And that was to the benefit of California and the farms within that region.

The other thing about this particular scenario, we did some high-level molecular analysis. And we could see that to California's benefit, that those two commercial flocks and the few backyard flocks that were in Washington, Oregon, and California were really point-source introductions. The waterfowl virus that was introduced into those commercial farms, either directly or indirectly. And that was to your advantage in that allowed the local officials to identify, quarantine, and eliminate those before they could spread to other farms.

This just emphasizes the lessons learned in California to other states is that the identification quickly of infections in farms and that rapid euthanasia, the 24 hour timeline, and rapid disposal is key to keep it from spreading.

Mr. COSTA. To get on top of it as quickly as possible?

Dr. SWAYNE. To get on top as quickly as possible. In the Midwest——

Mr. COSTA. Acknowledge it, eradicate it, and get rid of it.

Dr. CLIFFORD. That is exactly right. In the Midwest, unfortunately, the virus changed. And they didn't have as much time as California did in that the virus in, after the first several outbreaks

became much better adapted to chickens and turkeys, meaning it took a lot less virus to infect flocks. And, therefore, the spreading was much more rapid, having farm-to-farm spread.

And that is the part that really emphasizes excellent biosecurity, early detection, rapid depopulation, and then rapid disposal. We can't afford to have infected flocks sitting around producing virus, shed in environment. And we also need to get them in a proper disposal method to prevent that transmission to other farms.

Mr. COSTA. All right. Two final questions, Mr. Chairman, and then I will submit the rest as written questions. Dr. Swayne, I have been told that the funding for your facility falls dramatically short of what you believe or what is believed to be, maybe not you, needed for further efforts. Do you agree and could you elaborate?

Dr. SWAYNE. Yes. I can provide you a little more information. Science is essential in developing and implementing control and eradication programs for high-path AI. And that is what the role of research is. The research that we generate and other partners at universities in many of your states, as well as the CDC and other organizations, is essential in developing control policies that become what is used in the field. Those are long-term issues.

And for our laboratory, over the last 10 years, our staffing for avian influenza has declined from 35 to 20 people. And that is just the financial reality. Research is a long-term process because you have to hire people. They have to be trained. And we are all aware of the biosafety issues that we have to deal with in laboratories. You have to train these people, they have to operate in high-containment labs, work with these viruses.

So, for us, the issue has become long-term permanent funding has not kept up with the mission demands. And so, therefore——

Mr. COSTA. Could you give us an estimate what is needed? I mean, simply replacing those 15 personnel that have been cut back, is that a start?

Dr. SWAYNE. That is a start. And also we have had, of course, a new emphasis to making sure we do all of our research safely. And so that is not just replacing researchers, but it is adding biosafety officers, animal care, our other issues that are all part of the research process. And those are permanent funds we need because you have to have the research staff. The other issue is facilities——

Mr. COSTA. On that point, Mr. Chairman, I would suggest that maybe the Subcommittee considers, if there was some interest to submitting a bipartisan letter to the Appropriations Committee.

Obviously, it is going to be a fragmented approach I believe again this year as we do our budget. But when they are considering the final package later this fall, we might want to make a suggestion or a recommendation. But we can consider that among ourselves. Go ahead.

Dr. SWAYNE. And the second piece is facility issues. And Southeast Poultry, our facilities are quite aged. The U.S. Department of Agriculture did a critical infrastructure study across all facilities in the Department for capital improvements. And Southeast Poultry was the number one requirement across the whole agency for the last 3 years.

Mr. COSTA. So how close are we or where are we, would you estimate, scientifically from developing a vaccine?

Dr. SWAYNE. So, yes, we are near completing the first phase of the research data. We are now in discussions with APHIS on the analysis of this data. So Dr. Clifford's office and my office are, have started those discussions. We have started the statistical analysis of that data. So next week we will have a meeting to discuss the very specifics of what that data means. And then we will have additional studies that we are working with some university partners because that is the lab data we are generating and then we have to work with the field as far as how do you possibly implement an effective program or not——

Mr. COSTA. From a layperson's perspective or for a poultry farmer who may be facing this or for a local region where you have a television station that is covering this and they are making the report—and I see that Dr. Clifford, you are anxious here to comment—I mean we have to, when these things happen, we have to respond to the public. And so where are we?

Dr. CLIFFORD. Congressman, we will have vaccine availability in our stockpile for the migration period. To Dr. Swayne's point, there are several companies actually, besides the research that they are doing, there are several companies that have vaccines that they are prepared to have available.

So we will be going out with a request for a proposal specifically to be able to stockpile vaccines. And some of these will come in in different levels and stages throughout this period.

Mr. COSTA. For this fall?

Dr. CLIFFORD. For this fall and spring.

Mr. COSTA. Okay. Well, thank you, Mr. Chairman, for this very important Subcommittee hearing. And I want to thank my Ranking Member, Congressman Peterson, who is always on top of these issues, and the rest of the Committee Members. Certainly we want to cooperate in every way possible to provide support for our nation's poultry industry.

The CHAIRMAN. Mr. Newhouse.

Mr. NEWHOUSE. Thank you, Mr. Chairman, especially for holding this hearing on this important topic. This is certainly, seems to me, one of those things that is an all hands on deck kind of situation. And I appreciate the focus on it. I appreciate the panel being here this morning discussing these issues.

As a former director of my state agency, my agriculture department, I certainly appreciate the presence of our State Veterinarians here and your approach to helping us learn and be prepared for whatever happens into the future. It seems to me that when the next outbreak occurs, there will be no time for hand-wringing but positive action, quick action is what is key. Certainly, in my experience, I appreciate Dr. Clifford's valuable help in dealing with animal health issues in my state. And we are very appreciative of you being here this morning. I love this no time restraint. That is very valuable.

The CHAIRMAN. Well, be careful because we all may be in trouble by the time this is over.

Mr. NEWHOUSE. No, I appreciate the opportunity to delve into this subject. It is very important to all of us. Just a couple questions to begin with, Dr. Clifford, concerning the National Animal Health Laboratory Network. My understanding is that the funding,

Federal funding currently supplies approximately five percent of the costs of operating the state lab system. The same system, though, is critical to detection, response, recovery from disease outbreaks similar to what we have just experienced.

So for this year, can you tell us how the initial cases in any given state were detected and by whom? And then to follow up on that question, as part of this year's outbreak, the Iowa lab has been open I believe 24/7, running multiple shifts, keeping up with all the demands for testing and so forth. Do the labs, do you think, have the support they need to sustain this type of workload and this effort?

Dr. CLIFFORD. Thanks, Congressman, for that question. The National Animal Health Laboratory Network is an extremely important part of our infrastructure in the United States to be able to address not just this issue, but a lot of animal health issues. As you are probably well aware, there was language in the farm bill that addressed this issue for the NAHLN laboratories. But that did not come with funding. The NAHLN laboratories throughout this country are at different levels of funding, but we definitely need resources for those laboratories to be able to do the work that we so urgently need them to do and be prepared.

To speak to a specific lab in a specific state, we would have to probably defer more to the states themselves and the labs themselves to address those specifically. But, yes, funding is needed for those laboratories. And we do the best we can with the funding we have to provide them resources. I know that the House markup had additional resources for the NAHLN laboratories which was very welcomed and very much appreciated.

So as far as who does the diagnosis, it will vary in any particular location or state. But I can tell you a lot of these state NAHLN laboratories are very much involved in all this testing. And I know, for example, in Minnesota and Iowa, during this outbreak, there has been a huge effort there with regards to putting and having personnel available to do around-the-clock testing. We pay based upon or we basically destroy animals, depopulate these animals based on presumptive positives. And those presumptive positives are done by the NAHLN laboratories.

Mr. NEWHOUSE. Another question, Dr. Clifford, and you touched on this in previous questioning, concerning trade and economic issues and the steps that APHIS and USDA are taking as far as negotiating with foreign governments about vaccines and the potential that they hold as far as the impacts that that could have on poultry exports. But, on the other hand, there is interest in grocery and food producers industries about the flexibility with imports of poultry products, egg imports specifically, due to the many shortages that we are experiencing. Could you talk about any progress on that front?

Dr. CLIFFORD. Actually we have had shipments from the European Union. And also we have had recent shipments of eggs from layer facilities from Mexico into the U.S. now to help address some of the shortages that we have.

And I know of two countries right now, one is Mexico, the other is the Netherlands. And I am not sure if we are bringing in from other countries from the European Union or not, right off the top

of my head. But that is something I can find out. So that has definitively and will definitely continue to help us be able to address some of the shortages we have in the U.S.

Mr. NEWHOUSE. Thank you. Dr. Swayne, Mr. Costa asked you some questions about the production of viable vaccination. So I appreciate your comments there about steps in this process to help stop the spread and eradicate the virus.

I hate to think about the sky is falling kind of scenario. But based on your observations, when you are talking about the spread of this disease and the additional or potential risk to poultry operations around the world, specifically in other countries, Central America, South America, certainly through Europe and Asia, these flyways, obviously, go back and forth every year. What are we looking at in the future here? Are we just keeping our fingers in the dikes, so to speak, in trying to control something that is way bigger than us?

Dr. SWAYNE. We can look back at data generated in Asia, for example, from our Korean colleagues. So they have had 2 years of incursions from migratory waterfowl into their country bringing H5N8 high-path virus in. The worst year was actually in the fall of 2013, winter 2014. The second year it reoccurred but it was not as severe. The lesson, this has also been repeated in the last 15 years, where you would have an incursion with migratory waterfowl. You would have a real severe year, then it gets mild, then it kind of disappears in waterfowl, and it is only propagated in the farming system.

For us, the advantage we are at this point in the U.S. is all the surveillance evidence would suggest that we don't have the virus in current farms. So our real risk is what would come back through the migratory flyways. And that emphasizes the role of colleagues in wildlife health, including the USGS, USDA Wildlife Services, and surveillance programs that are being set up across southern Canada, northern U.S., even down the Atlantic Flyway coast trying to get a handle on is the virus in birds that are migrating or not. And if the virus is identified in particular flyways in geographic areas, then there should be information disseminated within those geographic areas for farmers to be extra vigilant in biosecurity and to very quickly report any abnormal clinical signs that might occur.

One thing that is really to our advantage is that the flyways we have in North America do generally go north and south in four different flyways. But the viruses don't readily go into Central and South America from us, nor from their viruses coming north. The mixing is much smaller, it is really a small area with a very few number of species that cover those, across both of our hemispheres. That is to our advantage, and it is also to their advantage. It is sort of a critical point, is if we can control outbreaks in poultry populations by preventing those, we reduce the likelihood of poultry infections and that would be a way of amplifying it.

And if we can do that, hopefully, the virus will self burn out in wildlife populations. But surveillance by USDA Wildlife Services, USGS, and university partners is critical to find the virus.

Mr. NEWHOUSE. Thank you. Dr. Clifford, going back to the authorization for the National Lab Network, what beyond diagnostic

capabilities should we be considering to enhance this disease prevention?

Dr. CLIFFORD. Congressman, specifically to the NAHLNs themselves?

Mr. NEWHOUSE. Yes.

Dr. CLIFFORD. I think probably making sure that we have the proper infrastructure within those laboratories to deal with diseases that are zoonotic and have zoonotic potential.

Mr. NEWHOUSE. That would be your priority? Okay. Then I have a question I would like to ask—Mr. Kelly from Mississippi had to leave early. He had a flight to catch.

Mr. COSTA. Would the gentleman yield?

Mr. NEWHOUSE. Oh, Mr. Costa. Please.

Mr. COSTA. Just for us lay people here, what is zoonotic?

Dr. CLIFFORD. It is diseases that can cross from animals to people.

Mr. COSTA. Okay. Got you. Thank you.

Dr. CLIFFORD. Like AI. This one doesn't, thank goodness but——

Mr. NEWHOUSE. Good question. Mr. Kelly has an extensive broiler industry in his State of Mississippi and is concerned about, apparently there are no infected birds, at least that have been detected there yet. So his question was why? Why do you think broilers have not yet been affected, if anybody has an opinion on that? Maybe they just do a great job in Mississippi as far as control.

Dr. MECKES. Congressman, it is age related. The broilers typically go to market in 56 days. And most of the birds that have been infected with this virus have been older than that. As a matter of fact, one of the opportunities for managing the virus has been the early marketing of birds, particularly turkeys. I know in parts of the Midwest, some of the turkeys have gone to market much sooner than they would under ordinary circumstances. At least those are our thoughts in North Carolina. I will defer to my USDA colleagues and Dr. Hartmann.

Dr. HARTMANN. Well, Congressman, it is interesting to note that it was, that did happen in Minnesota. We had broilers right in the heart of our turkey growing area where there was infection. And the broilers never were affected at all. I think that chickens are a little harder to be infected, it takes a higher dose, and they don't transmit it as much. But also the age factor was there as well.

Dr. SWAYNE. If I might make just a quick comment. There are probably two factors that have impacted the lack of broiler infections.

One is that there appears to be from field information an age susceptibility. So older birds are more susceptible than younger birds. And broilers are all very young, so they are less susceptible.

The second thing is that in farm operations, there are fewer entry point on a broiler farm because generally most of those have a family taking care of them and feed trucks only come usually at the third or fourth week of grow out. So there are very few points of entry *versus* if you look at a layer farm, where you have very large farms, lots of people going on lots of farms, lots of trucks, vehicles, equipment that may be shared, turkey farms where the birds are on the ground longer, you have a greater chance for mov-

ing a virus onto a farm that is a turkey or a layer farm than you do a broiler farm.

Mr. NEWHOUSE. Well, thank you. And thank you, Mr. Chairman. I will submit my other questions for the record. But I appreciate all your input.

The CHAIRMAN. Mr. Peterson.

Mr. PETERSON. Thank you, Mr. Chairman. I have a series of questions here that are from my producers back in Minnesota, things that have come up.

Dr. Clifford, one of the big concerns that growers have is the depopulation. I think you know that. You have heard it from them. Talking about other kinds of methods that could be used the next time around that would speed up this depopulation process and I guess maybe for Dr. Hartmann too, you both have talked about a goal of depopulation of 24 hours. And I can see that the turkey operation is much simpler. But on the layer operations, which some of these big layer operations, they have two or three million birds, it took some of them 3 weeks to depopulate. And during that time, the virus is pluming out of the building and so forth, potentially causing other kinds of problems.

So I guess the question is how can we, how are we going to get to a 24 hour depopulation? Or can we even accomplish that.

Dr. HARTMANN. Congressman, we are exploring a way that they have depopulated in Canada. And they are using CO_2 gas in the whole barn. I sent one of my employees up to a demonstration that they had. We are hoping that that will be a method that we could use in our layer barns.

One of the issues that I have been told may make it not available in the United States or, at least, in Minnesota is that our layer operations are five cages high. In Canada, they are three cages high. So it is hard to get the CO_2 up to the top level. But we are still exploring that.

And the only other method that we know of is to shut the ventilation down in a barn and heat it up. And that is not an, at this point, considered an acceptable manner of depopulation.

Mr. PETERSON. But if you let the birds die over 3 weeks, I am not sure that is very acceptable either. None of these options are very good.

Dr. HARTMANN. Right.

Mr. PETERSON. Dr. Clifford?

Dr. CLIFFORD. Thanks, Congressman Peterson. So basically our goal is to get the birds dead as quickly as possible. And 24 hours is our goal. To do that, we are looking at several options. There are some other things that we are looking at as well, besides the CO_2. And I have forgotten the particular product, but we are looking at another product.

We care about the humane treatment of birds and putting birds down as humanely as possible with regards to euthanasia. There is a definite distinction between euthanizing a bird *versus* mass depopulation. And so all these things have to be considered with regards to the overall situation, the concern for both animal health and human health. We need to basically look at all of these tools as we go forward and try to get the birds killed as quickly as possible, as humanely as possible, without further spread of the virus.

And as you indicated, Congressman, it is important to get that done within 24 hours. If we don't and we continue to have more birds dying from the virus, then there is more virus in the environment and more spread. And we know this to be a fact.

Mr. PETERSON. Thank you. Also in this regard, I have had concerns about disposal in the layer operations, where they don't have room in the barns, and so they have been composting them outside which people are concerned that this potentially would spread the virus as well.

So I guess one of the things you are looking at, and maybe Dr. Hartmann, you know about this, that there are some kind of bio bags that they are using to try to put them in the landfills. But there hasn't been agreements with the landfills and so forth, and so that slowed that process down. Where is that at? Is there going to be a way to deal with these layer operations without doing this outside if we have another outbreak?

Dr. HARTMANN. Congressman, I think the key here is, and we had one layer operation that did this, is if you can depopulate that quickly, within 24 hours of a diagnosis, the composting outside isn't as big a concern because you don't have a lot of virus. You have a very, you maybe have in a two million bird operation, you maybe have 50 dead birds that have virus. The rest don't.

The key to not spreading the virus that way is you can continue to compost outside, but you need to catch the disease very quickly. And you need to depopulate within 24 hours.

Mr. COSTA. Would the gentleman yield just for a point of clarification?

Mr. PETERSON. Yes.

Mr. COSTA. I am trying to understand the pathology on this and how the bacteria, these are unartful terms from a lay person again, but the shelf life of the organism that is living in this high-path influenza, from the time it is detected, from the time the flock is terminated to the disposal, does that bacteria, once the bird is no longer alive, does it still live on until the time it is buried?

Dr. HARTMANN. Yes. It does live on. And I might defer to Dr. Swayne to talk about that.

Mr. COSTA. So that is an important step then. I am just trying to understand this better.

Dr. SWAYNE. In this process, I think the critical issue that has been emphasized is that the quicker you can stop the birds from living, that means you stop producing more of this virus. And the influenza virus does not keep growing after the body is dead, after the carcass is produced.

Whereas in bacteria, *Salmonella, et cetera,* is that the bacteria can grow after you remove it from the carcass. But the virus, the peak amount of virus is when the birds are alive. So if you can euthanize, depopulate those birds, they stop producing virus. And then over time, that virus is inactivated. And it is very time and temperature dependent.

So composting is an excellent way to dispose of the carcass and kill that virus, deactivate that virus. Because the composting process has microbes that generates heat. And that heat kills, inactivates that virus, and also digests that virus. So that the compost

itself is completely innocuous other than it has nutrients that have value and could be land applied.

Mr. COSTA. So it is not just the euthanasia but it is quickly burying or composting the carcasses?

Dr. SWAYNE. Right. Because if you just leave the virus sitting in the environment, it can be tracked on people's shoes or clothes. If it is on equipment moving farm to farm, you can track it that way.

Mr. COSTA. Yes, I have heard that is possible. I thank the gentleman for yielding.

Mr. PETERSON. Thank you. The other related issue that I just heard about a couple days ago, in some of these layer operations, it has been a real problem cleaning it up. With, the belts and all of this sort of thing, it is a big problem.

And so this particular grower had heard about the potential of having a 120 day period that would change the way, you wouldn't have to go in and clean everything out, that the 120 day period would be, would potentially work, is that the case?

Dr. CLIFFORD. Congressman Peterson, yes, it is. We are looking at that and evaluating that, as well as maybe trying to look at heating the buildings up during that process in order to reduce the amount of cleaning and disinfection that has to be done. Because our primary goal here is not to clean the building, *per se,* it is to destroy the virus.

Mr. PETERSON. Kill the virus, yes.

Dr. CLIFFORD. So we are looking at those methods. And we have had discussions with University of Minnesota researchers as well as Dr. Swayne and his folks about that. And we are going to continue to try to evaluate that.

So it is one option that we are definitely looking at. And, hopefully, it will work. Because, to me, it would save and reduce a lot of work and a lot of resources that are currently having to be spent to clean these houses up.

Mr. PETERSON. And this particular producer said that he is probably going to be out 120 days anyway by the time he goes through all this process.

Dr. CLIFFORD. Right.

Mr. PETERSON. So it would be a lot cheaper for everybody.

Dr. CLIFFORD. Correct.

Mr. PETERSON. The other thing, as I mentioned in my opening statement, is there is a lot of concern about all the paperwork that is being required. It is the Federal Government so I understand that. But as we move forward, are you looking at ways to try to streamline this?

Are you looking at things like standardizing these payments based on the square footage of the barns or something, so that you wouldn't have to have 80 pages of forms? And if you did something like that, you might be able to actually lower the amount that is paid. You would have more competition, people competing to do it. Are you looking at that?

Dr. CLIFFORD. So, Congressman Peterson, there are really three different things we are talking about here. One is indemnification. That process has and continues to be simplified. It is not 70 to 80 pages long with regards to the indemnity part.

Mr. PETERSON. I should have mentioned, it is not——

Dr. CLIFFORD. It is the flock plan.

Mr. PETERSON. Right.

Dr. CLIFFORD. And it is the other document that they need to sign that deals with the C&D. That document can be very, very extensive and long. We hope to definitely simplify that. And I don't buy into the fact because we are the Federal Government it should be that long and complicated.

Mr. PETERSON. That is good.

Dr. CLIFFORD. In fact, I believe simplification is much better and oftentimes better understood. It is kind of like having a biosecurity plan that thick that nobody reads *versus* having a sheet of paper or two that somebody does read.

I think we can simplify this. One of the things that we are doing with the industry in the states on this is looking at maybe a square foot cost or a house cost with that and basically allowing the producers to handle that themselves.

Mr. PETERSON. There has been this discussion, the Secretary alluded to it a couple of times, about having an insurance system instead of the indemnification. I have some concerns about that. The indemnification works pretty well because it creates the incentive for people to find out as soon as they can whether they have the virus and you can get in there and depopulate quickly. I think it has worked pretty well.

And I have a real, I don't see how you can make the insurance system work. Because you are going to substitute APHIS employees for insurance companies it seems like if you ended up doing that. There might be a role for insurance maybe in the business interruption part of it. But the indemnification, that part of it, I don't know that we want to change that to some other kind of system because I think it is, I don't know what you think about that but——

Dr. CLIFFORD. Congressman, I am very much a believer in indemnification. In fact, I am not sure that Secretary Vilsack believes——

Mr. PETERSON. Well, and I should clarify because it was reported after he had the oversight hearing here that he was pushing an insurance——

Dr. CLIFFORD. Yes.

Mr. PETERSON. But I don't think that is what he said.

Dr. CLIFFORD. I think that is more for the downtime issues.

Mr. PETERSON. Right. And that is not what he said. But the impression was, and some people have talked about changing the system and trying to have some, have this be like the Livestock Disaster Program or have crop insurance, which the crop insurance companies have said there is no way to underwrite this. So they are not really interested.

So I just think it is good that we clarify this because it has been reported a couple times, including yesterday, from that Des Moines thing that said the Secretary was pushing insurance. Well, I don't think he really is in terms of what people think about this.

Dr. CLIFFORD. Right. Let me make one comment about indemnity. If you look at the countries around the world that do a good job of controlling disease, they pay indemnity. If you look at the countries that don't, they do not have indemnification.

Mr. PETERSON. Right. So, Dr. Hartmann, first of all, I want to have you, compliment you, your folks there and also our Governor and legislature for getting on the ball, setting up that emergency center. I think it was part of why we had a good response in Minnesota. And so you guys did an excellent job responding as best as you could.

This issue of the consistent case manager, are you able to augment what the USDA does in terms of personnel so we can have a situation where these case managers can stay with the operation the whole time and not be shifted every week.

Dr. HARTMANN. Congressman, at one time, we had to manage 110 sites. And when we had to do that, Minnesota didn't have the personnel. So we were relying on USDA employees as well. And they rotate into Minnesota for 3 weeks at a time, and then they rotate out. And that was the reason for the inconsistency in case managers. We are getting down now to the point where most of, we are about 50/50, Minnesota case managers and USDA case managers. So we continue to improve on that.

But it is something that I have heard before too. I heard somebody tell me that they had 12 different case managers. And that is not good because some of them tell, they get a little bit different story from everybody that comes in. So it is something that is of great concern to us. And we are certainly moving in the direction of having all Minnesota people working on it because then they can stay with the person the whole time.

Mr. PETERSON. Dr. Clifford?

Dr. CLIFFORD. Congressman, I agree too. And we are working to this fall and winter migration period, that if we do have those case outbreaks, that we want to try our best to provide one case manager per producer.

So having said that, a lot of this is because of the rotation of people. It is hard to take somebody away from their home for 10, 12 weeks. That is really not fair to them as individuals. So we are working on ways that we can do this a lot better.

Mr. PETERSON. Thank you. And I appreciate that. Dr. Hartmann, one of the other concerns we had when this was really going was getting these flocks tested and people having to drive to Minneapolis or some of them drove to South Dakota.

Where is the situation of trying to beef up, well, move some of the testing to Willmar? Is that being considered? Is that a possibility? It would make a much better situation, it would have been if we would have had that availability this time.

Dr. HARTMANN. Congressman, yes, the Minnesota Legislature dealt with that and the Governor signed a bill for $8.5 million for renovation of our laboratory in Willmar, to provide space and the technology to do the PCR test out there. I was very encouraged, they had put it on the fast track, and they said it would be done by February. I just got a note that the State of Minnesota slowed the process down. And I don't understand exactly the mechanism of that. But instead of February, now they are talking about next summer being done.

So anything you could do to encourage that move along quicker would be appreciated. But that was the pinch point. And we had

to hire a courier service to get the samples from out in west central Minnesota to St. Paul. And it cost a lot of money.

Mr. PETERSON. Yes. And I went through the lab in St. Paul. They had a problem keeping up when we had so many potential positives out there. And even with the situation there, I mean once they got the thing into the lab, they still had a back-up there sometimes.

Dr. HARTMANN. Yes. And they did get help from, some other states sent some technicians to Minnesota. And that helped. And then our laboratory hired three new technicians too. So one of the issues was the timeliness of it. They were working nights and weekends, which laboratory technicians aren't used to doing. We are used to doing that. So we are going to have a meeting with the University of Minnesota to talk about that before the fall.

Mr. PETERSON. Thank you. And last, I want to focus a little on this vaccine issue. We appreciate you saying that you are going to be commercializing this, stockpiling it. Did I understand you to say that you are going to do it even if it is not 100 percent?

That you are going to stockpile vaccine that is not a 100 percent? I thought that you were wanting to have the vaccine be 100 percent before you——

Dr. CLIFFORD. Well, let me state it like this. We are going to stockpile vaccine. We want the best vaccine possible that matches best with this particular virus. So it doesn't mean that vaccines that maybe don't match up can't be effective in helping build immunity within the birds. It can be.

Mr. PETERSON. So you might use more than one in combination?

Dr. CLIFFORD. It might be a combination of those. Dr. Swayne could probably give you——

Mr. PETERSON. Right. I was going to ask, I know you can't, but you have 100 percent positive now on the chickens? Is that, as I understand, you have a vaccine that tested 100 percent positive?

Dr. SWAYNE. I can just give you a brief rundown. We are doing multiple experiments, some using what we call an inactivated vaccine that we have made from a modified virus that is an outbreak virus.

And that virus vaccine, as was reported by the Secretary last week, in chickens we can prevent morality, completely prevent mortality in chickens. And that study also is being done in turkeys. And we will have that data available next week.

Mr. PETERSON. So it is going to be next week that we will know if we get the similar thing out of——

Dr. SWAYNE. The data will be available to APHIS. And we have to have discussion. The other issue is not just looking at an experimental setting of does this vaccine protect birds in a laboratory, but we have to then take the vaccines and say how can you use them in the field. There are different age of birds, there are different types of birds, there are different production scenarios.

So the other part, we call this vaccination effectiveness, it is how can you use vaccines in combination in the field. And the experience that we have working around the world in countries like Vietnam, Indonesia, China, *et cetera,* is that really to have an effective program in the field, you have to have a minimum of two different vaccinations separated by 3 weeks. So that makes it a little more difficult logistically in that you have to be able to in an economic

way give it at least twice. And if you have birds that are on the ground longer than 6 months, you probably need to give a booster.

So, for example, breeders and layers may have to have a booster in their lifetime. And those are researchable questions that are not just Southeast Poultry questions. These are questions that we are working with university partners and negotiating with them in helping us do some of these studies that would use commercially produced birds under commercial settings in an experimental protocol that we can control to tell us how effective or how we can effectively use vaccines in a targeted way.

Just one last digression, if you look globally at who has used vaccines for high-path IA, the countries that have eradicated most quickly have been the countries that have the best veterinary services in their country, that is Federal and state and county level veterinary services and excellent poultry veterinarians. We have that in the U.S. We have one thing in our favor.

The second thing is if a vaccination program is used, it is not a nationwide vaccination for everything. It is a targeted vaccination, surgical to the highest risk and the highest risk areas. So it is not everybody. It is who needs it the most and has the highest risk.

Mr. PETERSON. Yes. And that goes to my final question and that is on this trade issue. My people, and we had this discussion, they are very pleased that you are going to be stockpiling. And they see as having it available as a positive situation. They understand the practicalities of the trade situation and the pushback from some folks in the industry.

But in our part of the world, I have talked to the chicken people and the turkey people, they think that in our part of the world, the vaccine, they would give up their trade if they can get the vaccine in the Midwest from what I am hearing.

So when you are talking to these other countries, is part of the discussion whether it would be possible to kind of do it in a targeted area and make that less of a trade issue, make it easier to get this done.

Dr. CLIFFORD. That is the idea. And to Dr. Swayne's point and the point I also made earlier, it is using it in targeted areas that are of higher risk.

Mr. PETERSON. Is that how you are——

Dr. CLIFFORD. And Minnesota is, as Dr. Hartmann said the Land of 10,000 Lakes, there is a lot of waterfowl. So you certainly probably meet that criteria. So that is the idea is to try to get them to accept that and not shut off the entire U.S.

Mr. PETERSON. And is that the discussions that are going on with these other countries now?

Dr. CLIFFORD. That is the discussion, yes, that we are having with them. That is the discussion. With my trip to Asia, that will be in September, I am going to be visiting five countries and talking to them about that, but also visiting countries like China, just to try to get our markets reopened. And so we are also going to be going to many other countries in Europe and in Africa, as well as the Americas.

Mr. PETERSON. Thank you. And, again, I want to thank you, Dr. Clifford, Dr. Swayne, Dr. Hartmann, and you haven't been on the frontline yet, Dr. Meckes, and hopefully you won't be.

But as I said, things haven't been perfect. But you have responded when we have had concerns. And we appreciate it. And also I thank the Secretary and your people, I talked to a number of your folks who were at the Willmar emergency center and they were from Maine and Oklahoma and all over the place. And they were away from their families and working 7 days a week. And so it is a tremendous effort. And we appreciate it and look forward to working with all of you to get through this fall.

Hopefully, we won't have a similar situation. But if it does rear up, hopefully, we will have a much better response ready to go. So thank you all very much for what you have done. I yield back.

The CHAIRMAN. Thank, Mr. Peterson. Since I am the last one left and the Chairman of the Subcommittee, I suppose I have the right to ask one more question, if my staff will allow me. Otherwise, I might be fired perhaps.

But sitting here, thinking about the testimony and the questions back and forth, it occurred to me that we can get this absolutely 100 percent correct, but we also have a growing market, what some may call free-range, organic, locally grown, locally produced. What is the nature of our outreach to the very small mom and pop, organically grown, locally produced?

It strikes me that we can get it completely right on the commercial side, but we may have a gap here with a lot of very small, individual producers throughout all of our states. I am just curious what thought or plan of action has been contemplated there.

Dr. CLIFFORD. So thank you, Mr. Chairman. We have been doing outreach in this area for years. We have a very active, what we refer to as Biosecurity for the Birds campaign that really targets this sector of the industry.

So we also reach out through the poultry associations and groups and through the National Poultry Improvement Plan and many other groups to reach this sector of the industry. And I know that the states, and Dr. Meckes and Dr. Hartmann can probably add to this, the states do a lot, as well, with outreach to backyard type birds or organic or birds that are just raised outdoors. So there is quite a bit of outreach there.

The CHAIRMAN. Dr. Meckes.

Dr. MECKES. Chairman Rouzer, we are in the process of seeking to discern the location of all of our backyard flocks. We have about 4,000 flocks, small backyard flocks that we are aware of. And we have asked individuals within the State of North Carolina that own poultry to please contact our office and register with them.

Our desire is to be able to adequately convey information to them in the event of a disease outbreak. And I liken it to the red sticker in your children's window for the fireman to see. If the fire comes, we want to know where the birds are. And that way we will be able to adequately convey the needed information to the individual bird owners and the smaller flock owners throughout the State of North Carolina.

The CHAIRMAN. Mr. Peterson.

Mr. PETERSON. This age of instant communication, we have an e-mail in or a message from one of our growers that is watching the hearing. They have the impression because of the discussion we

had about you going over to the Far East in September, that USDA wasn't doing anything now.

So the question was why isn't USDA talking to our trading partners now? And as I understand it, you are. The Secretary has told me that you have been for some time already. Is that correct?

Dr. CLIFFORD. Yes, we are. We just had an international meeting in Baltimore. And a lot of our trading partners were invited to that and were present. And this was a topic that was discussed.

Mr. PETERSON. I just want to clarify. You are not the only person at the USDA. There are a lot of other folks.

Dr. CLIFFORD. No, sir. I am not. In fact, I get a lot of kudos for the things that are really done by a lot of others. So we much appreciate it. And I certainly appreciate——

Mr. PETERSON. So you have, the Department has been on this——

Dr. CLIFFORD. Yes, sir.

Mr. PETERSON.—ever since we started talking about——

Dr. CLIFFORD. Yes, sir. We are on this.

Mr. PETERSON. Thank you. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Peterson. I would like to, again, thank all of our witnesses for appearing before the Subcommittee today. I think this has been very helpful and informative. And those of you who have traveled longer distances than other, particularly thank you for your time and your effort to be here.

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

[Whereupon, at 10:18 a.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

SUBMITTED REPORTS BY HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM MINNESOTA

An Emergency Economic Impact Analysis

University of Minnesota Extension

Economic Impact of the Avian Flu, Updated 7/10/2015

July 16, 2015

To: Mary Knigge, House Agriculture Committee
From: Brigid Tuck, Senior Economic Analyst
University of Minnesota Extension Center for Community Vitality

RE: Economic Impact of the Avian Flu, State of Minnesota

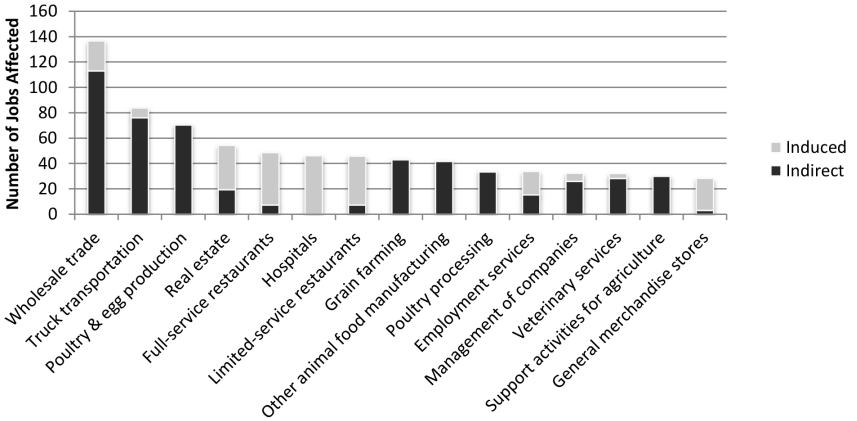
In May of 2015, Extension released findings from an economic impact analysis, using IMPLAN modeling, of the avian flu crisis in Minnesota. We recently updated these numbers and are providing them to you to inform proceedings of the House Agriculture Committee.

As of July 10, 2015, lost turkey and egg production and processing as a result of the avian influenza have decreased output in Minnesota's economy by an estimated $647.2 million. This includes $171.7 million of lost wages, salaries, and benefits. In addition, 2,500 jobs have been affected in some way by the avian influenza. These figures include losses of current birds and account for the fact that producers cannot immediately restock barns and therefore lose additional income. They also take into account the time it takes to bring layers up to full production of eggs.

The value of lost output in Minnesota's economy has more than doubled since the report was published in May. There are two primary reasons why the numbers have increased. First, the number of birds affected continued to rise through the month of May. The initial report was based on 5.7 million birds being affected. As of July 10, the number of birds had risen to over 9.0 million. Second, the new analysis accounts for lost production experienced by producers while their barns were idled during the clean-up and disinfecting stages.

Top industries affected by lost production and processing related to avian influenza include wholesale trade and truck transportation, as shown in the chart below. There is also a feedback loop that occurs as demand for new poults and chicks temporarily declines during the outbreak. We would expect those impacts to mitigate as producers begin to restock their barns. The chart also demonstrates that the impacts are widespread and affect a variety of businesses including agriculture, retail trade, restaurants, veterinarians, and corporate headquarters (management of companies).

Top Industries Affected by Lost Poultry and Egg Production and Processing Due to Avian Influenza, Minnesota, July 2015



Economic Emergency Program

University of Minnesota Extension

Impact of Poultry and Egg Production Losses and Poultry Processing Losses Due to the Avian Influenza

Executive Summary

In late winter 2015, avian influenza was discovered in a flock of commercial turkeys in Minnesota. After the first flock was infected, the virus spread rapidly. As of May 11, 2015, the disease has been confirmed at 85 turkey and chicken farms in 21 Minnesota counties, resulting in the direct loss of nearly 5.7 million birds in the state.[1] Approximately nine percent of all turkeys and 14 percent of all laying chickens have been affected by the outbreak.[2] In 2014, the value of turkey production in Minnesota was $866.2 million. The value of egg production was $265.9 million. Applying those figures to 2015, as of May 11, an ***estimated*** $113.6 million of poultry production has been lost in Minnesota. This does not include the value of future lost production (due to the further spread of the disease or lost production due to barn disinfection and cleaning).

Farms with the disease lose not only the infected birds, but the rest of their flocks on the same farm as well. Poultry and egg barns need to be disinfected over a period of time, meaning barns will sit empty, further decreasing poultry and egg production.

Clearly, these losses are affecting turkey, chicken, and egg producers. However, producers are not the only businesses to be affected by this incident. With fewer birds going to market and potential delays in restocking the farms, producers will spend less on local purchases of their traditional inputs into poultry and egg production (such as feed and veterinary supplies). Producers and their employees will also have less household income to spend at local businesses. These are the ripple effects of avian influenza.[3]

In addition to losses at the producer level, a decline in poultry and eggs produced has the potential to affect the processing industry as well. On May 5, Jennie-O announced it will lay off 233 workers at its turkey processing plant in Faribault. Obviously, idling of processing plants will also have ripple effects on the local economy.

To quantify these ripple effects, University of Minnesota Extension conducted an Emergency Economic Impact Analysis (EIA). This Emergency EIA quantifies the ripple effects of the loss of $1 million in poultry and egg production showing that $1 million in direct losses will likely result in a decline of $1.8 million in economic output in Greater Minnesota, including $450,000 in lost farm and household income. It also quantifies the ripple effects of the loss of 100 poultry processing jobs, showing that 100 lost jobs at poultry processing plants will lead to a loss of 210 jobs across Greater Minnesota's economy, including $9.3 million in lost household income.

Because the virus continues to spread, quantifying the exact loss at a specific date and time may not prove useful. Knowing the impact of $1 million in losses will allow the total economic impact to be adjusted based on the latest information available on poultry and egg production losses. Correspondingly, knowing the impact of 100 lost processing jobs will allow the total economic impact to be adjusted based on the latest information available on poultry processing losses.

This analysis is offered as a quick and initial look at the immediate, short-term impacts of the avian influenza. It is intended to provide context for decision makers in the midst of this economic event. Extension recommends a more in-depth and complete analysis be completed once the avian influenza has been contained in Minnesota.

What Is An Economic Emergency?

Communities can face a sudden and unanticipated change in their local economy. A major employer announces it is reducing its workforce, a fire destroys an operating facility, or a flood damages downtown. In these situations, communities often need to make quick, but important, decisions about how to react. They work closely with the local business(es) affected and work to help the business(es) and community recover. The University of Minnesota economic emergency program is designed to provide community leaders with information to assist in making decisions regarding the community's future. Information from the IMPLAN (MIG, Inc.) input-output

[1] Source: Minnesota Board of Animal Health, *https://www.bah.state.mn.us/*.

[2] Source: Minnesota Agricultural Statistics Service.

[3] Note: Producers will have expenses related to clean up and disinfection, as well as restocking their barns.

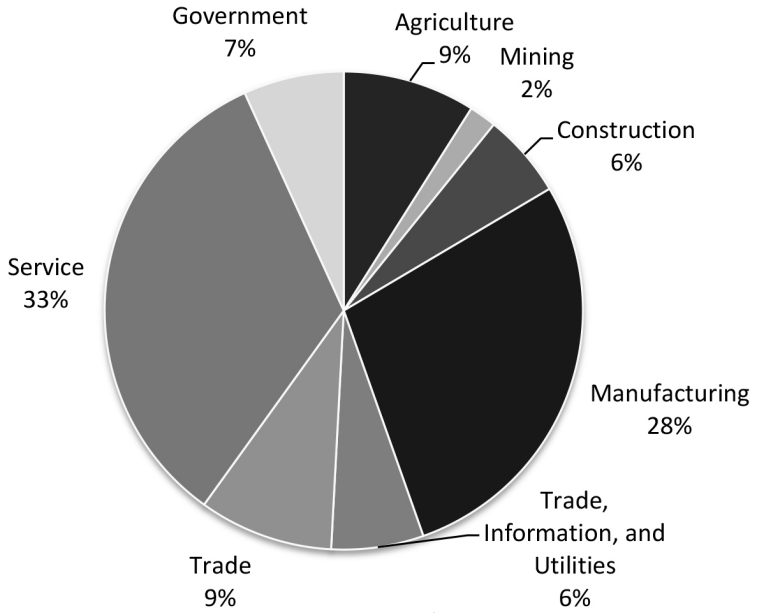
model is used in this analysis.[4] This report is presented in partnership with the EDA Center at the University of Minnesota-Crookston.

There are a few important things to note related to this analysis and the tool used. Please see the section on assumptions and terms to understand these factors.

Current Economy

In 2013, businesses in Greater Minnesota created $223.1 billion of output. The agriculture, forestry, hunting, and fishing industry was directly responsible for $20.0 billion (9%) of that output (*Chart 1*). Manufacturers using agricultural products in their processes produced $23.3 billion of the $62.7 billion (37%) in manufacturing output in Greater Minnesota.

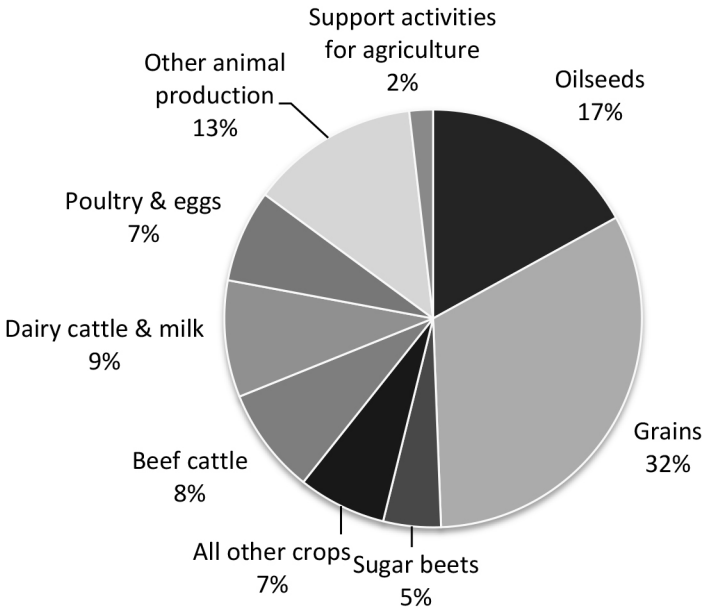
Chart 1: Output by Sector, Greater Minnesota, 2013



Poultry and egg producers, in turn, created $1.4 billion of output in 2013, or approximately seven percent of Greater Minnesota's agricultural production (*Chart 2*). In addition, poultry processing facilities produced $1.6 billion of output. Together, the industries produce $3.0 billion of output annually in Greater Minnesota.

[4] IMPLAN, Inc. *www.implan.com*.

Chart 2: Agricultural Output by Sector, Greater Minnesota, 2013



Economic Impact of Lost Poultry and Egg Production

Since it's unknown how long avian influenza will continue to spread in Minnesota (and thus the full impact of outbreak), this analysis will focus on the loss of $1 million of poultry and egg production. With careful interpretation, the impact of this $1 million of loss can be brought to the current scale of losses in the poultry and egg industry in Minnesota by multiplying the estimated total losses presented here by the current value of lost production. These figures should not be applied to the poultry *processing* industry.

Total Economic Impact

Each $1 million loss in poultry and egg production means that an estimated three jobs at poultry and egg farms themselves will be affected. At this time, the avian influenza is expected to decrease poultry and egg production for a short period of time. If producers are able to return to full production within a few months, it is possible these jobs will not be permanently lost. However, these jobs will be affected in the short-term (for example, employees may go several weeks without work or income).

During this period, an estimated $283,260 in labor income for the producer and the producer's employees will be lost (see the direct effect in *Table 1*). Labor income includes both proprietor income (income for the self-employed which would include income to poultry producers) and employee compensation (wages, salaries, and benefits for farm workers). Most of the direct loss (85 percent) is lost income for poultry producers.[5] Losses may be even greater in the short-term for poultry producers, as some will retain employees during the cleaning and disinfecting stages. The producers, at that point, will be paying wages to their employees without receiving any revenue to pay those wages.

Poultry and egg production generates additional economic activity in Greater Minnesota as a result of purchases by poultry and egg producers. These are described as indirect and induced impacts. When poultry and egg producers make purchases of inputs and supplies in the local economy, this creates indirect, or business-to-business impacts. When poultry and egg producers, their families, and their employees make purchases in the local economy, this creates induced, or consumer-to-busi-

[5] Note: some poultry producers may receive government payments to compensate for birds lost, as producers will receive payment for birds euthanized to prevent the spread of the disease. This will partially offset some the lost proprietor income.

ness, impacts. When these purchases decrease, as a result of declines in poultry and egg production, the corresponding local purchases will also decrease, causing a ripple of economic losses in Greater Minnesota.

Each loss of $1 million in poultry and egg production will have significant impacts on Greater Minnesota, as displayed in *Table 1.* For every $1 million decline in poultry and egg production, an estimated additional $808,590 in output in Greater Minnesota industries that serve producers and their employees will be lost. In total, output in the region declines by an estimated $1.8 million per $1 million of lost production. Of that $1.8 million of lost output, $450,000 will be lost labor income (includes proprietary/net farm income and employee compensation). For every $1 million decline in poultry and egg production in Greater Minnesota, Minnesotans will lose $450,000 in household income. Finally, poultry and egg losses will impact other jobs in Greater Minnesota. For every $1 million of lost poultry and egg production, an estimated seven jobs will be affected across all industries.

Table 1: Total Economic Impact of a $1 Million Loss of Poultry and Egg Production, Greater Minnesota

	Output	Employment	Labor Income
Direct	−$1,000,000	−3	−$283,260
Indirect	−$564,160	−2	−$94,910
Induced	−$244,430	−2	−$71,830
Total	−$1,808,590	−7	−$450,000

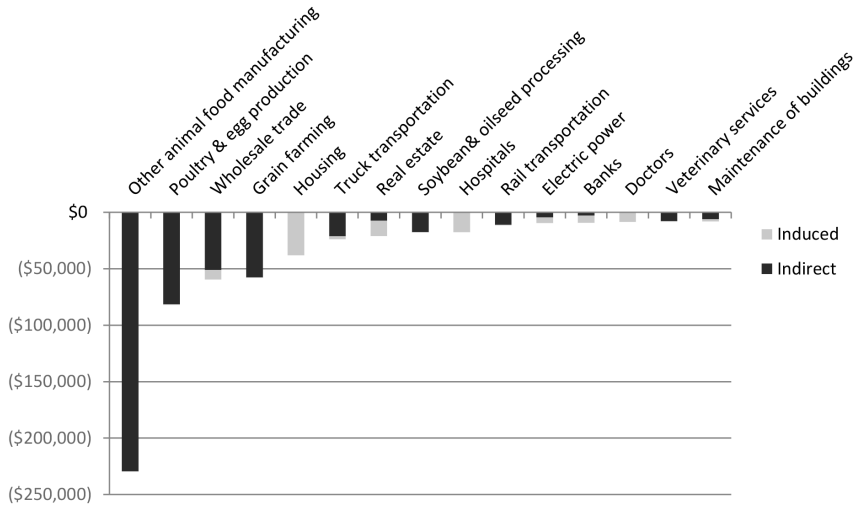
Estimates by University of Minnesota Extension.

The focus of this analysis is on Greater Minnesota, because the majority of Minnesota's poultry and egg production is in Greater Minnesota (the 80 counties not in the seven county metro). The economic impact of a $1 million decrease in poultry and egg production on the entire state of Minnesota (including the metro area) is $2.1 million including eight jobs affected and $560,000 of lost income (proprietor and employee compensation).

Top Industries Impacted

The IMPLAN input-output model can also provide estimates of the industries in Greater Minnesota that will feel the largest magnitude of impacts from the loss of poultry and egg production (*Chart 3*). The largest losses will be in "other" animal food manufacturing. Since poultry will not be raised, demand for poultry feed will decline. For every $1 million of lost poultry production, nearly $230,000 of demand for poultry feed will be lost in Greater Minnesota. Poultry and egg production itself will also be affected, as shown in *Chart 3.* Likely, these impacts are those related to demand for poults and for chicks. Therefore, this decrease may be temporary. In fact, this subsector of the poultry industry may experience a sharp spike in demand when producers are ready to restock their barns. Grain farming and oilseed farming also appear in the table as industries that will be affected. This chart reflects the number of grain and oilseed farm that provide inputs into poultry feed. Likely, grain and oilseeds not used for poultry feed will be exported.

Chart 3: Top 15 Industries Affected by a $1 Million Decline in Poultry and Egg Production, Sorted by Output



Modeling the Scale of Losses

As mentioned, the scale of the lost poultry and egg production is yet not clear for Greater Minnesota. Depending on the duration of the avian influenza outbreak, the scale of the impacts could change. Thus, Extension modeled a $1 million change in poultry and egg production. However, it is useful to think how these impacts might change based on the scale of the event. The following examples are provided only for illustrative purposes and not as predictions for the future.

Example 1: A $10 million loss of poultry and egg production

If poultry and egg production were to decline by $10 million in Greater Minnesota, then in total Greater Minnesota would lose an estimated $18.1 million in economic activity, including $4.5 of lost labor income. Across all industries, 70 jobs would be affected.

Example 2: A $113.6 million loss of poultry and egg production

As of May 11, 2015, Extension **estimates** approximately $113.6 million of poultry and egg production has been lost (based on 2014 production figures). The loss of an estimated $113.6 million in poultry production would result in a loss of $205.5 million in economic activity in Greater Minnesota, including $51.1 million of lost labor income. Nearly 800 jobs would be affected. These are estimates based on production values from 2014. They should be interpreted with caution. They do not include the value of lost production due to the barns being empty during the cleaning and disinfecting stage. If poultry producers lose another entire cycle of production, these estimates could double.

Example 3: A $200 million loss of poultry and egg production

Poultry and egg production losses may increase with time. If poultry and egg production were to decline by $200 million, then in total Greater Minnesota would lose an estimated $361.7 million in economic activity, including $90 million of lost labor income. Across all industries, 1,400 jobs would be affected.

Economic Impact of Lost Poultry Processing Jobs

Since the effects of the avian influenza are only beginning to be felt by the processing industry, this analysis will focus on the loss of 100 poultry processing manufacturing jobs. With careful interpretation, the impact of these 100 lost jobs can be brought to the current scale of losses in the poultry processing industry in Minnesota by multiplying by the current value of lost jobs. These figures should not be applied to the poultry and egg *production* industry.

Total Economic Impact

According to the IMPLAN input-output model used in this analysis, the loss of 100 poultry processing jobs in Greater Minnesota is associated with a direct loss of

an estimated $27.3 million in poultry processing output. The lost output includes an estimated $4.9 million worth of wages, salaries, and benefits for the affected workers.

When a processing plant idles and employees are laid off, businesses beyond the processing plant will be affected. The processing plant will decrease purchases of its material supplies leading to indirect or business-to-business losses. With a drop of 100 jobs at processing plants, an estimated 50 jobs will be lost in other industries. Note, since this analysis examines poultry and egg production impacts separately, lost poultry production jobs are not included in the indirect effects. The model estimates 30 poultry production jobs are affected for each 100 poultry processing jobs lost.

When the processing plant idles, workers will be without incomes. The model estimates that lost incomes for plant workers will affect 60 jobs in other industries in Greater Minnesota.

In total, the loss of 100 poultry processing jobs in Greater Minnesota will result in an estimated 210 jobs being affected across all industries. The total economy will experience a decrease in output of an estimated $44.8 million, including $9.3 million in labor income.

Table 2: Total Economic Impact of 100 Lost Poultry Processing Jobs, Greater Minnesota

	Output (millions)	Employment	Labor Income (millions)
Direct	−$27.3	−100	−$4.9
Indirect	−$10.8	−50	−$2.4
Induced	−$6.7	−60	−$2.0
Total	−$44.8	−210	−$9.3

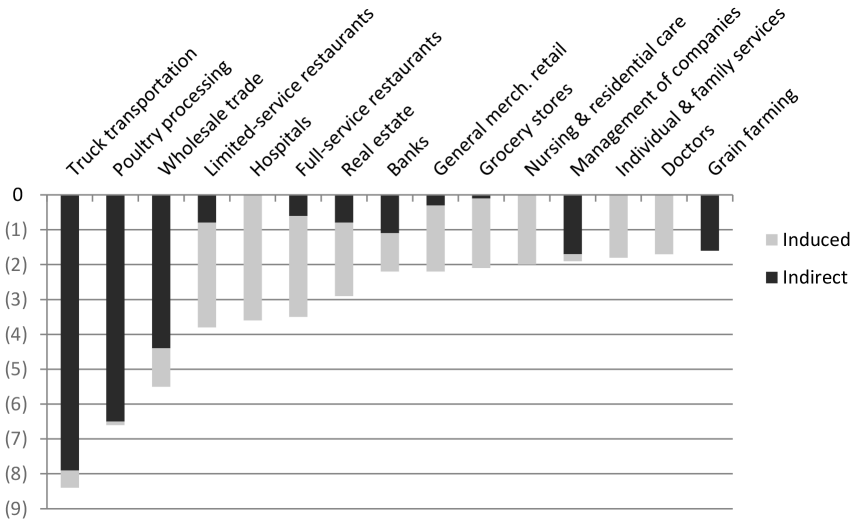
* Note: Estimates do not include lost poultry production.
Estimates by University of Minnesota Extension.

The focus of this analysis is on Greater Minnesota, because the majority of Minnesota's poultry processing is in Greater Minnesota. The economic impact of a 100 job decrease in poultry processing on the entire state of Minnesota (including the metro area) is $64.5 million including 275 jobs affected and $15.8 million of lost income.

Top Industries Impacted

The top industries affected by lost poultry processing jobs are highlighted in *Chart 4.* A loss of 100 poultry processing jobs will affect nearly nine trucking jobs, seven poultry processing jobs (likely at processors that perform specialty processing tasks), and six wholesale trade jobs.

Chart 4: Top 15 Industries Affected by a 100 Job Decline in Poultry Processing, Sorted by Employment



Modeling the Scale of Losses

As mentioned, the scale of the lost poultry processing is yet not clear for Greater Minnesota. Depending on the duration of the avian influenza outbreak, the scale of the impacts could change. Thus, Extension modeled a 100 job change in poultry processing. However, it is useful to think how these impacts might change based on the scale of the event. The following examples are provided only for illustrative purposes and not as predictions for the future.

Example 1: 233 Lost Poultry Processing Jobs

The loss of 233 poultry processing jobs will result in 490 jobs across all industries in Greater Minnesota being affected. It will result in the loss of $104.4 million of lost output, including $21.7 million in labor income.

Example 2: 500 Lost Poultry Processing Jobs

It is possible additional poultry processing jobs will be affected as a result of the avian influenza. If 500 poultry processing jobs are lost, then 1,050 jobs across all industries would be affected. The lost jobs would translate into $224.0 of lost economic activity, including $46.5 million in lost labor income in Greater Minnesota.

Considerations

Given the ever changing nature of the avian influenza in Greater Minnesota, Extension elected to analyze using a unit loss of $1 million in poultry and egg production and 100 lost poultry processing jobs. There are several layers of additional considerations when thinking about the overall impact of the avian influenza in Greater Minnesota.

- **Age and maturity of bird losses.** Producers with older birds will have higher investments in their birds than producers whose birds were younger at time of infection.
- **Fixed prices.** This analysis assumes prices remain fixed. This is an important assumption, as decreased demand for inputs into poultry and egg production may decrease the cost of inputs. Decreased input prices will affect expenditures for those inputs. Further, changes in the price of poultry and eggs, which could rise as supply decreases, would also change farm incomes. The input-output model used in this analysis does not account for price changes.
- **Insurance or government reimbursement.** Some of the producers affected may receive compensation for lost birds, mitigating the effects of some of the lost farm income. However, impacts on the supplying industries (identified as indirect effects in this report) will not be offset.

- **Impacts of barn cleaning and disinfecting.** This analysis focuses on a loss of poultry and egg production using a fixed model of production. The avian influenza will cause some spending and activity to occur that is outside the normal for producers. For example, there will be producer costs associated with purchasing cleaning supplies and then resetting the barns for production (for example, added bedding). These will be costs to the poultry producers in the short-term, but might actually spur additional economic activity as suppliers of poultry bedding increase production to meet demand.
- **Long-term effects on the poultry and egg industry.** This analysis focuses on the short-term effects of lost poultry and egg production. If producers are able to return to full production within a few months, these effects will dissipate. However, this is a point of high uncertainty in the industry. If avian influenza persists as an issue, producers may not be able to return to full production, leaving them vulnerable to leaving the industry. Uncertainty may affect credit availability, further hindering operations.

Purchasing Patterns for Producers and Processors

The input-output model, IMPLAN, estimates ripple effects based on industry purchasing patterns (production functions). Extension is providing the production functions here to allow decision makers to understand supply linkages. Note: IMPLAN adjusts the amount spent in a local economy based on supply available in the study area.

Poultry and Egg Producer Purchases

Table 3 shows purchases by poultry and egg producers. According to the IMPLAN input-output model, for every $1 spent by poultry and egg producers, $0.68 is spent on inputs (goods and services). The other $0.32 is spent on labor, indirect business taxes, and property income.

Table 3: Purchases by Poultry and Egg Producers

Item	Amount of Every $1 Spent
Animal food	$0.40
Labor income, indirect business taxes, and property income costs	$0.32
Poultry and egg products	$0.09
Wholesale trade	$0.05
Grains	$0.02
Energy	$0.02
Truck transportation	$0.01
Soybean and oilseed processing	$0.01
Support activities for agriculture	$0.01
Veterinary services	$0.01
All other inputs	$0.06
Total	$1.00

Source: IMPLAN.

Poultry Processing Purchases

Table 4 shows purchases by poultry processors. According to the IMPLAN input-output model, for every $1 spent by poultry processors, $0.79 is spent on inputs (goods and services). The other $0.21 is spent on labor, indirect business taxes, and property income.

Table 4: Purchases by Poultry Processors

Item	Amount of Every $1 Spent
Poultry and egg products	$0.45
Labor income, indirect business taxes, and property income costs	$0.21
Processed poultry meat products	$0.11
Truck transportation services	$0.04
Management of companies	$0.02
Wholesale trade	$0.02
Paper bags and coated and treated paper	$0.01
Paperboard containers	$0.01
Meat processed from carcasses	$0.01

Table 4: Purchases by Poultry Processors—Continued

Item	Amount of Every $1 Spent
Other plastics products	$0.01
All other inputs	$0.11
Total	$1.00

Source: IMPLAN.

Prepared By

Brigid Tuck, Senior Economic Impact Analyst, *tuckb@umn.edu,* 507–389–6979

With peer-review by:

William Lazarus, Extension Economist—Farm Management and Professor
Kent Olson, Interim Associate Dean and Extension Economist—Farm Management
Matt Kane, Program Leader
Liz Templin, Extension Educator
Neil Linscheid, Extension Educator

Assumptions and Terms

Economic impact analysis is based on several critical assumptions. An understanding of the assumptions ensures the results are interpreted properly. Here are the key assumptions made in this analysis.

- One job is one job, regardless if the job is full-time, part-time, or seasonal. The jobs considered here are not full-time equivalents. Therefore, it isn't unusual for industries with high levels of part-time employment to experience higher employment impacts.
- The model is linear. Changes in output or employment can be modeled in a linear fashion. For example, if the estimated lost production of poultry and eggs in Greater Minnesota are $10 million, one may multiply the amounts noted in this report for losses in total output and employment from $1 million in lost production by ten to obtain estimates for the $10 million in lost production.
- The database is built on data available publicly. When data is not available for a specific industry, say due to data disclosure issues, econometric models are used to create estimates for the industry.

Key Terms

The following are a few key terms used in economic impact analysis.

Output

Output is measured in dollars and is equivalent to total sales. The output measure can include significant double counting. For example, think of corn. The value of the corn is counted when it is sold to the mill, again when it is sold to the dairy farmer, again as part of the price of fluid milk, and then yet again when it is sold as cheese. The value of the corn is built into the price of each of these items and then the sales of each of these items are added up to get total sales (or output).

Employment

Employment includes full- and part-time workers and is measured in annual average jobs. Total wage and salaried employees as well as the self-employed are included in employment estimates in IMPLAN. Because employment is measured in jobs and not in dollar values, it tends to be a very stable metric.

In the model, one job is one job, regardless if the job is full-time, part-time, and seasonal.

Labor Income

Labor income measures the value that is added to the product by the labor component. For example, in the corn example, when the corn is sold, a certain percentage of the sale goes to the farmer for his/her labor. Then when the mill sells the corn as feed to the dairy farmer it includes in the price some markup for its labor costs. When the dairy farmer sells the milk to the cheese manufacturer, he/she includes a value for his/her labor. These individual value increments for labor can be measured. This is labor income. Labor income does not include double counting.

Labor income is comprised of employee compensation (wages, salaries, and benefits) and proprietor income. Proprietor income includes income for the self-employed, which is how many agricultural producers register their income.

Property Income

Property income is a computation of the value that accrues due to ownership of property. This includes payments for rents, royalties, and dividends.

Indirect Business Taxes

Indirect business taxes are taxes a business pays for normal operations. It includes excise, sales, and property taxes. Fees, fines, licenses, and permits are also included in this category.

Direct Impact

The direct impact is equivalent to the initial change in the economy.

Indirect Impact

The indirect impact is the summation of changes in the local economy that occur due to **spending for inputs** (goods and services) by the industry or industries directly impacted. For instance, if employment in a manufacturing plant increases by 100 jobs, this implies a corresponding increase in output by the plant. As the plant increases output, it must also purchase more of its inputs, such as electricity, steel, and equipment. As it increases its purchase of these items, its suppliers must also increase its production, and so forth. As these ripples move through the economy, they can be captured and measured. Ripples related to the purchase of goods and services are indirect impacts.

Induced Impact

The induced impact is the summation of changes in the local economy that occur due to **spending by labor**—employees in the industry or industries directly impacted. For instance, if employment in a manufacturing plant increases by 100 jobs, the new employees will have more money to spend to purchase housing, buy groceries, and go out to dinner. As they spend their new income, more activity occurs in the local economy. This can be quantified and is called the induced impact.

Total Impact

The total impact is the summation of the direct, indirect and induced impacts.

SUBMITTED QUESTIONS

Response from John R. Clifford, D.V.M., Deputy Administrator, Veterinary Services, Animal and Plant Health Inspection Services, U.S. Department of Agriculture

Questions Submitted by Hon. David Rouzer, a Representative in Congress from North Carolina

Question 1. On the issues of decontamination and sanitizing equipment impacted by the AI, are farmers sanitizing the equipment, replacing it, or some combination of the two?

Answer. As part of the virus elimination process, APHIS has provided funding for producers to clean and disinfect equipment and, in some cases, replace it. Our determination is based upon the circumstances at each particular farm and what steps and actions are necessary to eliminate the virus.

Question 2. Do your regulations account for the most cost-effective disinfection measure or just require disinfection? We have heard that replacement of equipment may actually be cheaper than disinfection in some cases. If that is the case, do your policies allow for this option?

Answer. In some cases where cleaning and disinfecting was difficult or impossible, APHIS did in fact replace equipment, consistent with 9 CFR Part 53. While our policy for cleaning and disinfecting had been to remove organic material from the facility before washing equipment and applying a disinfectant, we will focus more heavily on virus elimination moving forward. This will allow us, in certain cases to use dry cleaning methods wherein heat and temperature ensure the virus is eliminated.

These methods still ensure the elimination of the virus while being more cost effective than wet methods.

In addition, in conversations with industry and stakeholders, we heard repeatedly about the need for a flat rate (such as per bird, or per square foot) for virus elimination. This approach, which we are examining, would simplify the process, by reducing the amount of paperwork, ensuring consistency, and shortening the time it takes for the virus to be removed—thereby allowing most producers to begin restocking sooner.

Question 3. With regard to private sector contractors, it doesn't surprise anyone that the quality of the work performed would be related to the experience and expertise of the contractors. Understanding that this was an all-hands-on-deck operation, were any problems encountered with the quality of the work done by contractors that needs to be addressed moving forward?

Answer. As part of our fall planning, we've evaluated the work of contractors and will continue to work to ensure that they are implementing our response plan. Although limited in number, when we did identify issues with the performance of contractors, we moved quickly to correct those issues or, when appropriate, to dismiss the contractors. Moving forward, we are committed to ensuring that an APHIS employee is present at each affected facility to ensure the quality of work being performed through direct oversight.

Question 4. Recognizing that there was a tremendous volume of birds to be depopulated, can you expound on the time it took, on average from identification of the virus to depopulation of the flock, and specifically touch on the policy changes that enabled quicker response times later in the outbreak?

Answer. While we don't have an average depopulation time, we do know that times varied widely depending on the type of poultry population and the location of the facility. Much of the initial delay for depopulation of turkey flocks at the beginning of the outbreak in the spring in Minnesota was related to time needed to transport resources to affected sites. APHIS brought in additional resources through contracting for personnel and equipment, which decreased the time for completion of depopulation. Depopulation of egg-layer sites posed challenges because of the number of personnel needed to manually remove birds from individual cages, rather than a lack of equipment. The changes we made as the event progressed were to be more proactive in acquiring resources faster and in larger numbers. As part of our fall planning efforts, we've taken a number of steps that should allow us to respond more quickly to new outbreaks of the disease. Among these efforts include an itemization of essential equipment and strategic stockpiling of it in key areas; an increase in the number of employees who are immediately able to respond to outbreaks; and the stated goal of depopulating sick birds within 24 hours, which will help reduce the amount of virus present in the environment.

Question 5. It is my understanding that rendering of the birds did not occur because of significant hurdles, but that rendering could speed up the cleanup phase because the process *does* eliminate the virus and renderers have good capacity to handle the material. I know that this technique has been used in Europe with High-Path birds and it seems that it could really help with the sheer volume during an event like this. So do you believe that rendering is a good option?

Answer. Thus far in this HPAI event, no renderers have been interested in participating in the disposal process. We continue to look at rendering and are in discussions with renderers on the possibility of using this option.

Question 6. In regards to the larger conversation of disposal, to your knowledge have any universities engaged in new research regarding options for more efficient disposal methods?

Answer. Several companies have approached USDA with new methods for disposal. Most of the companies are working with universities to validate or develop their prototypes and are also looking for Federal funding to assist in that development process. To this point, no new or novel approaches have been validated that would meet the demands of large-scale disposal, although USDA continues to advertise for sources of disposal services in FedBizOps and to work with researchers to identify and validate new technologies.

Question 7. It is my understanding that some of the incinerators used did not hold up very well or the process was slow. Is that correct?

Answer. Incineration overall was a very expensive and troublesome process. One key factor is that poultry carcasses contain a high degree of moisture, making incineration difficult, especially given the number of depopulated birds. The smaller units worked well but could not handle the demand. The large units did not function well, were continuously in need of repairs, and could not stay operational. Overall, incin-

eration was not a successful endeavor during this outbreak for carcass removal, although it was useful for disposal of some contaminated products and fluids.

Question 8. I know that FEMA used some fairly powerful incinerator systems after Hurricane Katrina that worked fairly well and I was wondering if conversations took place with FEMA or any other agency about what resources that might work better in disposing this type of material and this much volume?

Answer. We did not have any conversations with FEMA about incineration, but it was a tool we used. Incineration proved useful only for certain materials, like bedding/litter, fluids and other more traditional materials for which they were designed. However, they did not function well for the incineration of bird carcasses.

Question 9. Does APHIS intend to spend any Federal resources in developing better disposal methods?

Answer. APHIS has established a system for individuals and companies to present their proposals for funding considerations. Several proposals are in the review process now.

Question 10. When do you plan to allow farmers to repopulate their farms?

Answer. USDA has criteria in place that must be met before farmers are allowed to restock, to minimize the risk of re-infection. This process can begin, provided those criteria—including virus testing—are met, 21 days after the completion of cleaning and disinfection. We are making steady progress in restocking.

Question 11. How close are we to determining how to stop the spread or recurrence of the virus?

Answer. With what we already knew about HPAI and the lessons we learned from the spring outbreak, we know there are a number of actions we can take to slow the spread of HPAI should it come back in the fall or winter. First, we've increased wild bird surveillance, which will allow us to more quickly identify where the disease may strike. We've also learned that we all need to reemphasize biosecurity. The industry has provided guidance about best practices and we have distributed information about biosecurity best practices as part of the fall plan we recently released. We've also identified the need to depopulate affected flocks within 24 hours to reduce the amount of virus they produce, which will decrease the likelihood of the virus contaminating the surrounding environment. In combination, these steps, along with the proper disposal of dead birds and an emphasis on virus elimination in affected barns, gives us the best chance to slow and stop the spread of the virus.

Question 12. What have you found regarding the implementation and efficacy of biosecurity measures being utilized by growers?

Answer. One of the lessons we've learned is that we all need to be vigilant about maintaining stringent biosecurity measures, especially in the face of a disease outbreak. The strength of our biosecurity efforts depends on all of us—producers, their employees, USDA, state and local governments and our contractors who are responding to this outbreak. While standard biosecurity efforts practiced by the poultry industry may have been sufficient in the past, evidence of farm-to-farm spread of the HPAI virus strain circulating in the Midwest shows that stricter biosecurity is needed. Guidance for enhancing biosecurity provided by the poultry industry, as well as in our fall preparedness plan, will help to address the gaps in biosecurity that led to some lateral transmission of the disease in the spring outbreak.

Question 13. What further biosecurity measures can be taken by growers to prevent the spread of avian influenza?

Answer. As part of our fall planning efforts, USDA developed ideas to strengthen biosecurity. To support producers in this effort, APHIS has developed educational materials and a biosecurity self-assessment checklist, which are available online or as a webinar through the U.S. Poultry and Egg Association. As we improve our understanding of what biosecurity measures will be most effective against HPAI, we will update these publications and communicate them to poultry producers. We will also continue to engage other Agencies that conduct on-farm regulatory functions (Agricultural Marketing Service, Food and Drug Administration, *etc.*) and provide them with suggested biosecurity protocols for their activities. Additionally, APHIS is developing an interim rule on HPAI indemnity that will contain a provision requiring all future HPAI-affected commercial poultry producers to self-certify that biosecurity procedures were in place at the time HPAI was detected. This represents the first step in creating a system of greater accountability for biosecurity. Following this, we will collaborate over the next year with industry to design a biosecurity auditing system. An industry-driven initiative, or an addition to the National Poultry Improvement Plan, are two possible approaches.

Question 14. What are some challenges associated with controlling disease spread for the different poultry industries?

Answer. Different segments of the poultry industry have different practices, which mean that a one-size biosecurity plan isn't always appropriate. With egg-laying facilities, for example, there are often huge numbers of birds in multiple buildings on a premise. These birds are often in various stages of their life cycle and workers are constantly entering facilities and moving between barns. With turkey farms, their facilities are often not as fully enclosed as the structures are often designed to allow for increased access to air and shade from the sun, which may expose them to wild birds or airborne disease in a way that other segments of the poultry industry may not be. Additionally, we know that one of the keys to reducing lateral spread is to reduce the amount of virus in the environment, which can be achieved by rapid depopulation of sick birds. The preferred depopulation methods are water-based foam or carbon dioxide. Those work well at turkey facilities, where birds live on a floor, but in other segments of industry, we faced challenges that increased the amount of time it took to depopulate sick birds. Specifically, egg-layer facilities, where birds are housed in individual cages that may be stacked in multiple levels, present challenges to depopulate quickly. APHIS, with concurrence from the State and the producer, will consider alternate methods when depopulation cannot be carried out within 24 hours using foam or carbon dioxide.

Question 15. In response to the recent outbreak, it is our understanding that APHIS had developed a plan to employ as many as 800 veterinarians for a 13 month period at a GS11 wage scale. If APHIS had more veterinarians employed prior to the outbreak, could they have responded to better minimize the economic damages?

Answer. APHIS staffing reductions over the last few years necessitated that we contract much of the response work and limited the number of APHIS employees—who are doing critical work in the field assisting businesses and producers with critical import and export issues—who could assist with the emergency response. APHIS is hiring more than 350 additional temporary employees—including 210 animal health technicians, and 90 veterinary medical officers. These additional employees will assist in reducing the potential size and spread of an outbreak, and thereby will reduce the economic impact to producers and the cost to the Federal Government. We are also confident that the policy and operational changes we have made as part of our fall preparedness plan will help to quicken our response efforts and minimize economic impacts to producers should HPAI return in the fall or beyond.

Question 16. The Veterinary Medicine Loan Repayment Program authorizes the Secretary to enter into 1 year agreements with veterinarians enrolled in the program to assist in emergency situations. Has APHIS been able to make emergency use of veterinarians enrolled in the student loan forgiveness program?

Answer. The emergency services aspect of the National Veterinary Medical Services Act (which VMLRP partially implements) has never been implemented due to insufficient appropriations to support more than the primary objective of the program, *i.e.,* incentivizing veterinarians to fill food supply veterinary service shortage situations.

Question 17. How many accredited veterinarians are available to assist APHIS in managing this outbreak?

Answer. Accredited veterinarians are encouraged to apply to the National Animal Health Emergency Response Corps, a program through which veterinarians become temporary USDA employees in emergency situations. One hundred and one NAHERC personnel volunteered and were hired this year to respond to HPAI out of the 4,000 NAHERC veterinarians and technicians who have signed up to potentially assist USDA. Although 4,000 may have volunteered, there is no requirement that any of them actually deploy. Some may choose not to volunteer for a particular outbreak due to the location of the outbreak or their specific expertise.

Question 18. I support USDA–APHIS getting the funding needed to allow for proper training and education of those that may be required to react to another outbreak. It is my understanding that APHIS is planning on hiring some 300 people to help in the fall for a 12 month appointment. How will those that are hired be managed and focused on helping industry, and where will they be located?

Answer. APHIS is in the process of advertising and hiring more than 350 term positions (hired for a 13 month period with possible extension) related to HPAI. These veterinarians and technicians will be trained by APHIS to be ready to respond to HPAI, located across the United States and managed by local supervisors. They will be deployed to an HPAI incident when needed, and when not deployed they will assist with preparedness and conduct routine animal health duties in the field.

Question 19. A lot of very different types of farms—with significantly different business models—have been affected by this epidemic. For example, the repopu-

lation of egg-producing farms proceeds on a very different, and considerably longer, timeline than broiler or turkey operations. What steps can be taken by APHIS to ensure that the formula for fair market value is adequately compensating growers for losses associated with disease outbreaks?

Answer. APHIS provides indemnity to pay for animals destroyed as part of its disease response activities. Indemnity is calculated based upon the fair market value of the birds at the time they are disposed. For animals such as turkeys, this largely involves replacement costs of the bird itself. For egg-laying hens, their value is a function of the costs to raise the birds to lay and of the eggs they produce. At the industry's request USDA lengthened the assumed period of lay in the layer indemnity calculator from 80 to 90 weeks, which will help to ensure that producers receive fair market value for egg-laying chickens depopulated as a result of HPAI. We have recently received a request from some in industry to provide indemnity compensation for downtime losses. We have determined that these payments would not be consistent with the purpose of indemnity payments, as outlined by the Animal Health Protection Act (AHPA). Under the law and the applicable indemnity regulations, USDA provides affected producers with indemnity equal to the fair market value of euthanized birds.

Question 20. As you are aware, indemnification is an important issue for our growers. I have heard from egg producers in my district and they have expressed concern that the amount they are receiving falls short of the value of the hens' future egg production. Is there an opportunity to review the formula in this regard? Can you outline what the current formula covers and how it's being applied?

Answer. The calculator APHIS uses to determine bird value is updated regularly, based on current market prices, and APHIS has discussed the calculator with various industry sectors over the course of the current outbreak. The calculator incorporates pullet chick prices, pullet feed and other pullet growing costs plus feed and other costs associated with egg production into the bird values generated. By including such costs the calculator ensures that egg producers will always receive value equal to their cost of production for pullets being raised and unrecouped costs for hens that are producing eggs. In addition, during periods of favorable egg prices the calculator adds a portion of net revenue to bird value. At the request of industry, USDA adjusted the calculator to increase the laying period from 80 to 90 weeks. This change increases net revenue and in turn bird value.We will continue to engage all sectors of the poultry industry to assure a transparent understanding of the assumptions and data used within the APHIS indemnity calculators.

Question 21. Are there different indemnification formulas used based on the type of AI outbreak? Specifically would a farmer whose flock was destroyed because of Highly-Pathogenic Avian Influenza (HPAI) be compensated differently than a farmer whose flock was destroyed by Low-Pathogenic Avian Influenza (LPAI)? If the formulas are different, which formula is APHIS using to compensate affected egg farmers?

Answer. The formula for calculating the fair market value of poultry is the same for HPAI and LPAI. However, the regulations provide for payment to owners only for HPAI, while LPAI regulations allow payments to be split between growers and owners in contract-growing situations. While we have worked with owners to ensure growers are treated fairly according to the terms of their contracts, APHIS is developing an interim rule to harmonize the two regulations and provide split payments for HPAI.

Question 22. Are there ways that the indemnification process might be streamlined and improved?

Answer. APHIS continues to review the indemnification process to ensure that payments are fair and processed as quickly as possible. Because indemnity is based on the inventory of birds at the time of infection, we are encouraging producers to keep accurate records. We will also compile the inventory as quickly as possible: as soon as a suspect flock is identified, or a foreign animal disease investigation is started, or presumptive positive result is obtained from a laboratory. We also allow state animal health officials to prepare the inventory, which can save additional time and help speed indemnity payments to producers.

Question 23. I understand that as a result of USDA restrictions on re-populating and due to the nature of the egg production business, farmers will not be able to immediately re-populate their farms to normal, pre-destruction egg-producing capacity. Instead, it will take months or even years for a commercial-sized farm to resume full egg production. In light of this hardship, do USDA or the states have programs in place, risk management or otherwise, to account for the substantial lost income that will result from this unplanned downtime?

Answer. USDA's Farm Service Agency (FSA) can provide direct and guaranteed loans to operators of a family farm who meet program eligibility requirements and can project a feasible plan based on reliable projected income. The maximum loan amount for a direct operating loan is $300,000, and for a guaranteed operating loan is $1,392,000. Direct and guaranteed operating loan funds may be used to pay operating expenses, develop farmland and make facility improvements, including biosecurity improvements, buy livestock and equipment, and pay family living expenses. Use of an FSA guarantee may allow a lender to restructure a borrower's debts and continue financing. FSA is working with lenders and producers in affected areas in an effort to address credit needs.

In addition, FSA offers servicing options to assist producers who have outstanding loans and are not able to make scheduled payments. FSA is committed to using all available authorities to assist borrowers impacted by HPAI.

USDA's Risk Management Agency (RMA) awarded a contract to conduct a feasibility study as required by the 2014 Farm Bill for insuring poultry producers against catastrophic loss due to disease. Due to the HPAI outbreaks, RMA extended the timeline so that the contractor could gather as much information as possible from impacted producers by this event. RMA anticipates transmitting the draft report to Congress in the fall of 2015. Based on the outcome and recommendations of the study, RMA will then determine next steps for moving forward on the potential development of an insurance product.

Question 24. What has been the economic impact, to date, of the avian influenza outbreaks on the poultry industries?

Answer. We estimate that net economic losses at the national level for U.S. feed, livestock, and poultry producers combined total $1.0 billion from the first quarter of 2015 through a recovery period ending the fourth quarter of 2017. The largest losses occur for broiler meat and turkey meat due to embargoed trade and for crop producers due to reduced demand for feed. We estimate that producer net losses over the same 3 year period would have been as much as two to three times greater absent the APHIS response to stamp out spread of the disease as quickly as possible.

Question 25. How do trading partners make the decision to restrict trade? Which guidelines do they follow?

Answer. Veterinary officials in each country determine if there is risk to their poultry industry stemming from importations of different commodities. Processes vary by country and should be—but are not always—based on science (risk determinations) and international standards. The World Organization for Animal Health guidelines advise a regionalized approach for trade restrictions, and we encourage our trading partners to adhere as closely as possible to these standards as we do when we decide what products we can or cannot allow into the country.

Question 26. Regarding trade implications, when can a restricted or control zone be declared disease free? When will this declaration be recognized by trading partners?

Answer. The control zone is released when the State determines it is free of risk. Some States chose to keep control zones in place longer than others. In general, once the flock has been depopulated and there has been adequate surveillance of the poultry in that zone to be sure there are no active infections, the zone can be released. We consider the zone as free of infection 90 days following the date that cleaning and disinfection has been completed, which is consistent with international animal health guidelines. Once the 90 days is up, we notify trading partners through our updates to the World Organization for Animal Health (OIE) or individually as per our trade agreements. Trading partners make individual determinations on when to recognize the elimination of these zones, although we urge all of them to adhere to international standards, which recognize HPAI-free status after 90 days of eradication.

Question 27. What is the chain of command in place in each state to respond to an outbreak?

Answer. HPAI outbreaks are managed at the local or state level until local resources are overwhelmed. Upon request by the state, APHIS will then supply additional resources to assist in the incident. When that occurs the state and APHIS work collaboratively under a joint command structure to manage the incident.

Question 28. Have any gaps in communication between response team members been identified during the previous outbreak? How can these be addressed?

Answer. Communication is always an area for improvement, and APHIS is working on ways to better communicate within teams. APHIS held a meeting of the Incident Management Teams on September 1–3, 2015, and one of the topics was to develop better processes that will reduce or minimize any communication gaps. Among

those processes, we have developed plans to expand public outreach to producers and communities impacted by HPAI to ensure that a more consistent and timely message is delivered. We have also identified the need for unified joint commands where APHIS and state officials are physically together to share information and make decisions. We intend to establish joint commands for any future HPAI response efforts that require state and APHIS partnership and coordination.

Question 29. We know USDA along with the poultry industry recently finished a 2 day conference on "lessons learned" in Iowa. Can you share any preliminary results from that meeting? What is APHIS doing to ensure the knowledge gained from this disaster is captured, analyzed and utilized for future disasters?

Answer. APHIS used the knowledge gained from the Iowa conference to enhance preparedness for fall. Among the topics discussed at the Iowa conference were setting a goal of depopulation within 24 hours, establishing a flat rate for payments to eliminate virus from affected facilities, and preparing to be able to utilize vaccination as a response tool. APHIS incorporated input from that conference in those three areas—as well as input received from the other meetings and conferences held throughout the summer—into the Fall plan, which it released publicly in September.

Question 30. We have learned from this AI outbreak that it takes a tremendous amount of human resources to deal with all of the challenges associated with something this size. Has Congress given you all of the resources needed to be able to address this problem adequately? Do we have enough trained resources to handle a similar outbreak in multiple locations this fall?

Answer. Under the Animal Health Protection Act, the Secretary has the authority to request funding from the Commodity Credit Corporation (CCC) to deal with outbreaks of foreign animal diseases. We have used this authority to fund our emergency response activities to this point, and should we identify additional needs, we will consider requesting the use of additional CCC funds . . . As part of our previous funding requests, and to prepare for any potential fall outbreaks, we received funding to begin hiring additional term employees, including veterinary medical officers and animal health technicians and the production of vaccine to be used if deemed necessary. APHIS has also added another Incident Management Team composed of employees who are specifically trained to respond to an animal health emergency.

Question 31. This question is directed at the broader work USDA and APHIS conducts regarding the vaccine strategy for future foreign animal disease outbreaks. We have been advised there is a serious shortage of Foot-and-Mouth Disease (FMD) vaccine needed to manage an outbreak. Can you enlighten the Committee on this issue and how you plan to deal with this shortage? Do you have an estimate of the cost of improving vaccine availability and have you requested additional appropriations to address the problem? We have also been advised the Administration believes the livestock industry should help pay for an expanded FMD vaccine bank. How would you propose that industry help pay for FMD vaccine? Have you offered a plan to the industry?

Answer. APHIS considers the use of vaccines a key tool in our ability to eradicate FMD should it enter the country. Accordingly, we maintain a supply of about 25 million doses of vaccine across multiple strains in the North American Vaccine Bank. However, this amount of vaccine on-hand will not be sufficient to eliminate a large outbreak of the disease.

Estimates of the amount of vaccine needed to address an outbreak of FMD in the United States vary. Dr. Jim Roth of the Iowa State University Center for Food Security and Public Health did a study that recommends 250 million doses of vaccine across multiple strains, which would cost $150 million per year for 5 years. APHIS has set a preliminary goal of increasing to 35–40 million doses of vaccine across multiple strains.

APHIS' 2016 appropriations request included $1.2 million for the North American Vaccine Bank. This amount is a continuation of baseline funding and would only maintain the vaccine bank at its current size.

Given the mismatch between estimates of vaccine need and what APHIS currently has access to, the Agency has had discussions with industry about how best to address the gaps in vaccine coverage. Those discussions have included a range of alternatives, including Federal-industry cost-sharing, to fund efforts to eliminate the shortage, and those conversations with industry are ongoing. APHIS and industry recognize the need for an increased vaccine stock, and we are committed to working with our partners to identify solutions.

Question Submitted by Hon. Jim Costa, a Representative in Congress from California

Question. Please explain how the agency is engaging with our trading partners to minimize trade disruptions and provide an update on such discussions that have taken place or are scheduled to occur.

Answer. USDA has had regular discussions with our partners to minimize the impacts of the HPAI outbreak on trade. In June, USDA participated in the International Conference on Avian Influenza and Poultry Trade in Baltimore, Maryland. There, USDA directly engaged trading partners around the world to discuss how to minimize the risks of the disease and to ensure continuity of safe trade. APHIS officials have been continuing those conversations and met directly with key trading partners to emphasize the safety of U.S. poultry products throughout September.