A Changing Landscape: 
Meeting Future Needs of The Food Industry

Although traditional training of food animal veterinarians is still applicable, the new food animal health workforce will need to be prepared for a different future. There are many driving forces. Agriculture is undergoing profound changes as it becomes more global, involves more public health issues, and increasingly involves non-agriculturalists in its decision-making and public policy. Concurrently, other factors including the emergence of new infectious diseases, increasing threats of exotic pathogens, continuous food safety and security problems, potential for introduction of pathogens by terrorists, decreasing profit margins, and a changing work force have combined to create new realities and challenges.

Summer Food Systems Fellowship Program

To meet the specific need of providing relevant experiences in the food systems arena, the College of Veterinary Medicine has provided seed money to establish the Summer Food Systems Fellowships Program. By joining forces with food industry partners, the goal of this program is to provide a training experience that broadens the student’s view of the food industry. Students will apply for and be selected for these positions based on criteria established by the fellowship partners. It is the expectation that these fellowships will be beneficial to the students, the industry partner and the overall veterinary training program at MSU.

2008 marked the third year for the Summer FSF program. Thirty-six food animal interested students have participated in the program (8 in
Four students who participated in the program in 2006 have graduated and three of these students are currently in a primary food animal practice or post-DVM food animal internship. Sixteen different industry partners have participated in the program since 2006. Their willingness to participate in a new and innovative program underscores their commitment to the future of food animal agriculture and the need to train well qualified veterinarians to work in the food industry. Most importantly, their mentorship of students has provided invaluable experiences that have broaden the skills of food animal interested students. We believe these skills will make these future professionals better prepared to meet the needs of the food animal agriculture not only in Michigan but nationally and internationally.

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In this publication, you will find brief descriptions of the experiences of the student participants in the 2008 Summer Food Systems Fellowship Program. You can also find more information about the program at [http://cvm.msu.edu/fsf](http://cvm.msu.edu/fsf).
Contents

Erin Kelly  Michigan
Department of Community Health  4

Jesse Veenstra
Michigan Department of Agriculture  7

Kristen Twedt
American Association of Bovine Practitioners  9

Jenna Kline
Michigan Department of Agriculture  11

Kenny Rogers
MSU NFSTC, Dr. Paul Bartlett  13

Leigh Lewis
USDA APHIS VS  15

Meghan Swinkey
Michigan Farm Bureau  17

Jessica Reum
Antel Bio  19

Tracy Petzke
Michigan Milk Producers Association  21

Lindsay Weaver
Pfizer Animal Health  23

Stacia Belda, Nina Duflo, Jessica Seate
MSU NFSTC, Dr. Julie Funk  25

Tara Erickson
Intervet  27

Katie Laudacina
Michigan Department of Agriculture  29
Erin Kelly  
Michigan Department of Community Health

The Michigan Department of Community Health is one of 20 departments of the state government. The department was created in 1996 by consolidating the Department of Public Health, the Department of Mental Health and the Medical Services Administration, the state’s Medicaid agency. The Office of Drug Control Policy and the Office of Services to the Aging were later consolidated with MDCH. The Division of Communicable Disease (CD), within the Bureau of Epidemiology, provides support and consultation to local health departments and other health care professionals, collects and analyzes data on communicable diseases to share with the health care community and engages in special studies related to the control of communicable diseases. The CD division also develops programs and strategies to control communicable diseases as well as provide liaison with CDC on issues related to communicable diseases. Surveillance of diseases is an important feature of the CD division and is crucial for identifying outbreaks and epidemics, developing appropriate modalities for prevention and control, as well as evaluating effectiveness of control programs. The ability of MDCH to conduct adequate surveillance is essential for protecting community health.

As a food systems fellow for MDCH, I was exposed to many aspects that encompass public health. The beginning of the summer consisted of learning government acronyms, attending meetings with various state agencies to develop Pandemic Preparedness plans, listening in on conference calls with Centers for Disease Control & Prevention, and adjusting to an office cubicle. One of my responsibilities this summer was to complete training courses in Incident Command System through the Federal Emergency Management Agency. Incident Command System is an emergency management scheme, designed from many businesses best practices, that allows effective leadership, organization and allocation of resources in the face of a major event. Police and fire departments are the experts on incident command; using it to respond daily to a wide range of emergencies. I am now certified in the four courses (ICS 100, ICS 200, ICS 700, and ICS 800) offered that describe Incident Command structure and National Incident Management System.

My main project for this summer was to review a series of studies describing the epidemiology of Salmonella infections in Michigan and present the findings to local health authorities. While I was beginning this task, our nation began to face the largest outbreak of Salmonella saintpaul food borne illness in a decade. This event came at a perfect time and allowed me to participate in the full extent of outbreak investigation. I worked along with a few of the state epidemiologists as well as an Epidemic Intelligence Service Officer (EIS) to evaluate case definitions, questionnaire utilization, and apply epidemiology to describe the illnesses in Michigan. At the same time this Salmonella outbreak was occurring,
an outbreak of E. coli O157:H7 was detected initially in Michigan and Ohio but subsequently expanded to include other states. This gave me another opportunity to participate in outbreak investigation, apply descriptive epidemiology, as well as be exposed to the political implications of food borne outbreaks. My eyes were opened to the roles that local, state, and federal health authorities play when threats are made to public health.

As the Salmonella outbreak continued to grow, I continued working on my review project. The role of Salmonella in Michigan illnesses was examined by a team of researchers from Michigan Department of Community Health in collaboration with Michigan State University. A series of studies were conducted to: 1) analyze data from 1995-2001 on all laboratory-confirmed cases of Salmonella in Michigan 2) investigate specific risk factors in a case-control study, and 3) assess the role of neighborhood level data to identify risk factors. The goals of these studies were to describe the epidemiology of Salmonella, identify high-risk groups, and risk factors in Michigan for acquiring a Salmonella infection. I presented the “Salmonella Symposium” to a group of local health authorities at an Epidemiology and Laboratory Capacity Committee meeting in late July. Attendees at this meeting represented several local health jurisdictions as well as state-level public health employees. This symposium was given great reviews and feedback from local health departments identified the need for this type of evaluation to be completed on several different communicable diseases. My summer seemed to already be packed with pandemic preparedness meetings, food borne outbreaks, and the “Salmonella Symposium” when I was asked by the Division of Environmental Health to do some research on mercury exposure in animals. Mercury spills happen quite frequently and this type of incident is handled by community health to ensure proper cleaning of the spills is conducted. A mercury spill was reported to MDCH by a veterinary clinic and animals in the clinic were exposed to the mercury. This particular event prompted Environmental Health to develop a fact sheet for these situations where animals are also exposed. I spent a couple weeks researching mercury exposure and toxicity in pets and helped complete this fact sheet which is now accessible on the MDCH website. This mini-project was a very interesting learning experience for me. An article I have written will be published in The Michigan Veterinarian, an MVMA publication, sometime this fall.

This fellowship with MDCH has been an amazing experience. The role of veterinarians is apparent in all aspects of public health. As new zoonotic diseases are emerging, threats to our food supply arise and emergencies compromise the health of humans and their pets, opportunities for careers in public health expand. As a future large animal veterinarian, I have a duty to protect animal health and promote public health. I will be responsible for ensuring food safety by ensuring healthy animals enter the food supply. Keeping animals healthy on the farm will reduce the incidence of food borne illnesses for humans. My experiences with disease surveillance and epidemiology at MDCH will be an extremely valuable tool that will allow me to evaluate disease trends at
the population level. Just as disease surveillance is conducted on populations of humans, the same concepts can be applied to herds of livestock. Population and herd health status can be managed more effectively through the use of descriptive epidemiological concepts. The incident command training I received will also be extremely beneficial in my future career as a veterinarian. As the need for emergency preparedness plans accelerates, the need for veterinarians trained in emergency response is also on the rise. The State Animal Response Team (SART) is a team of veterinarians and veterinary technicians in Michigan who are trained in incident command system and emergency response. In the face of an emergency or natural disaster, this team can respond to care for those animals that may be affected. My certification will allow me the opportunity to participate in the SART after I graduate.

These are just a few of my experiences as a food systems fellow with MDCH that have been extremely rewarding and will guide me into a well-rounded career in veterinary medicine.
The Michigan Department of Agriculture is the state organization that has a mission to, “Serve, promote, and protect the food, agricultural environmental and economic interests of the people of the State of Michigan”. This summer I worked for the Animal Industry Division, which is overseen by the State Veterinarian. This division is responsible for animal health throughout the state. It works with the federal and local authorities to monitor movement of animals in and out of the state through testing for disease and issuing movement permits. The MDA responds to any animal disease that arises in the state that threatens the greater population. To ensure quick responses to diseases within the state there are surveillance programs for certain diseases, control measures and eradication programs. The MDA also runs programs that oversee animal identification, pet shops, shelters and riding stables.

I was hired this summer to work in the bovine tuberculosis (bTB) Eradication project. Bovine TB has been a problem in the state of Michigan as the disease has established itself in the wild deer population in parts of Michigan. Since bTB is a zoonotic pathogen, keeping it out of the cattle herd is vital for human health as well as the economic impact to the state for reasons of shipping cattle across state lines. At the moment the State is divided up into three zones depending on the presence or absence of the disease in that area.

Before starting work this summer, I received a phone call asking if I had seen the news about the discovery of pseudorabies in game ranch swine in Michigan and if I would be willing to work on pseudorabies for some of the summer. While this is not a zoonotic disease it is highly contagious among swine and can be fatal if other animals contract the disease. Michigan is a pseudorabies free state and an outbreak of this disease threatened the state status and the commercial swine industry as a whole. Since this was a pressing emergency I was put on loan for 6 weeks to the efforts to find the extent of the disease in Michigan, test pigs and assist in the depopulation of affected pig herds. While this was not initially what I signed up for it was a great experience with plenty of fieldwork to keep me busy.

At the beginning of the pseudorabies incident I spent some time in the ICS (Incident Command System) meetings and learned how government organizations are developing a method to respond to emergencies. Following these meetings I was trained in restraint and jugular venous blood draws on pigs.
I then spent time in the field helping in surveillance; knocking on doors within a five-mile radius of infected herds trying to find anyone who might have pigs on their property. Once surveillance was completed I teamed up with a state veterinarian to “bleed some pigs”. Through this I gained quite a bit of experience handling pigs and drawing blood samples under the veterinarian’s supervision.

I was also involved in the depopulations at some of the facilities that were infected with pseudorabies. This was interesting as these pigs were either at game ranches or being raised for game ranches. USDA Wildlife Services was responsible for the euthanasia of the animals while I and other MDA staff members hauled bodies, tagged and weighed them for disposal and indemnity payments. I even got some very preliminary training at tissue sample collection such as tonsils for research. In some of the depopulations I also participated in helping flush from the woods some of the pigs that were not able to be trapped or penned up for the sharp-shooters.

Once my time on pseudorabies was over I went back to working on bovine TB. I attended the conference that was hosted by a variety of organizations in the state about bovine TB and heard about bovine TB in other parts of the country and the world as well as some of the exciting research going on concerning this disease. After participating in some cattle TB testing I put together a survey for the producers who had been tested earlier this year for a bTB positive deer in Shiawassee County. The survey was a success with a majority responding; and I was able to put together a report on cattle producers’ opinions on testing experiences, wildlife risk mitigation and deer herd management.

This experience taught me a great deal about the role of public health in animal industry and its importance as so many of these diseases will affect producers’ ability to market their animals outside of their local area or the state. I also was struck by the involvement of private veterinarians in helping the state with manpower for testing and in educating producers about the need for wildlife risk mitigation. Through some of the meetings I attended and through talking with producers, regulators and industry organizations I gained a much broader understanding of what animal agriculture looks like and the impact that infectious diseases play in that industry.
Kristen Twedt  
**AABP Food Systems Fellow, 2008**

**The American Association of Bovine Practitioners**  
The American Association of Bovine Practitioners (AABP) is a national organization affiliated with the AVMA and the World Association for Buiatrics, and dedicated to serving the needs and interests of bovine practitioners, cattle owners and cattle around the world. Founded in 1965, the AABP serves about 5,000 members. One of the veterinary needs that they address is providing continuing education for their members through their national conferences as well as providing them with medical resources.

**AABP Food Systems Fellowship Position**  
As a Food Systems Fellow for the AABP, I helped them to develop online continuing education opportunities, write a survey to determine membership needs, create a database of state continuing education requirements, and identify scientific sources of information. I began the summer by researching the veterinary continuing education requirements by state, and whether or not continuing education completed online was acceptable to fulfill the requirements. At the same time, I also found scientific articles and classes for continuing education credit that would be great resources for AABP members.

In mid-June I was fortunate to be chosen to participate in a veterinary communications course funded by Schering-Plough/Intervet that took place in Spokane, WA. This course focused on how veterinarians can communicate with clients to understand the clients’ needs and concerns, express their plan for treatment and client compliance as well as handle negative situations. After the first day of introduction and teaching the methods, we practiced mock client interactions with actors that helped us apply the concepts to real-life situations.

Shortly after my return, I was sent to Kansas State University in Manhattan, KS to meet with Dr. Dan Thomson, and Dawn Anderson and Dana Reinert of the Institute for Academic Alliance. I had two projects to discuss with Dawn and Dana; the first was mapping out a way for the AABP to begin forming its own academic alliance program among several of the veterinary schools. This program would provide graduate certificates in various aspects of bovine medicine to veterinarians and veterinary students alike. Second, they helped me to design a survey to assess the needs and desires of the AABP membership.
with regards to online continuing education. This survey was then put into place through Kansas State's Axio Survey program. Out of approximately 5,000 AABP members, we had 734 responses, 660 of which completed the survey.

The survey results concluded that most AABP members are in private practice and interested in online continuing education classes, but not necessarily courses toward degree credit. Quality, relevance and ease of use were the three most important aspects of continuing education to AABP members. By far, the majority of respondents said that having national conventions broadcasted online would not make them less likely to attend in person; however the largest group of respondents had not attended a convention in person in the last 5 years. Most members were willing to pay for online continuing education units, with the largest group willing to pay $21-$40 per CEU.

A Summer of Invaluable Opportunities
Working as a Food Systems Fellow for the AABP this summer has been an excellent experience for me. I have met so many influential and inspiring veterinarians, both within the AABP government and through contacts I made while completing my projects. I also learned about organized veterinary medicine, especially the infrastructure of the AABP. It has deepened my interest in food animal medicine, and my enthusiasm for organized veterinary medicine and the accomplishments it can attain. It was also great to have a hand in creating projects that will revolutionize how the AABP provides continuing education as well as projects that could revolutionize how food animal medicine in taught in veterinary schools. I would certainly repeat this experience, and I am excited to further develop the contacts and connections I have gained from it. In the future, this experience will do nothing but help to foster my career as a food animal veterinarian.
The Michigan Department of Agriculture is a branch of the state government that oversees the many aspects of agriculture in the state. The Animal Industry Division (AID) is responsible for protecting the health of domestic livestock and pets, as well as the public's health; this involves livestock and poultry disease programs, the eradication of animal diseases, and regulations on the import and export of animals.

This summer I worked on the Avian Influenza Surveillance Program, which tests domestic poultry and waterfowl at county fairs across the state. This federal grant funded program allows the state to monitor the health of backyard poultry. Although the Asian strain of Avian Influenza, that has the ability to infect people in some cases, has not been found in the United States there are many strains of the virus, both high pathogenic and low pathogenic. Avian Influenza occurs naturally in the wild bird population and in domestic flocks, most birds only get mild cases that may only cause a drop in production or are not noticed at all. However, the H5 and H7 strains can mutate quickly from a low pathogenic strain to a high pathogenic one very quickly and cause high mortality rates in infected flocks, it is these strains that make a surveillance system so necessary.

Commercial poultry growers have intense health programs and rigorous disease monitor systems to ensure optimum health and productivity of their birds. Small flocks and poultry grown in backyard situations do not undergo such disease surveillance, and are more likely to come into contact with the migrating waterfowl that are known to carry the virus.

The first part of my summer fellowship was spent mailing letters to fairs and calling those that had participated in the past. There are a few fairs in June but the Michigan fair season does not get into full swing until July and August. While I was waiting to hear back about the letters I sent out I had the opportunity to ride with field veterinarians and even do some surveillance for pseudorabies, which had been found on several game ranches. It was on these trips that I learned the most about what regulatory medicine is and the role veterinarians with the Department of Agriculture play in the lives of livestock owners.

It wasn’t long before I started to receive calls from poultry superintendents or fair board members that were interested in having us test at their fair. This program has been going on for several years and each summer more fairs express interest in having their birds tested. When testing at a fair I, along with a field veterinarian, would arrive, get on our protective clothing for biosecurity and
collect our samples with the help of the poultry superintendent. The people in the poultry barn or at the gate could always guess who we were before we told them because we were the only ones at the fair dressed in long sleeve coveralls and boots, carrying a clipboard and cooler. For poultry the sample is taken from the trachea, and waterfowl from the cloacae, which can be much harder to find than you might expect.

This summer we tested and distributed educational materials on Avian Influenza at 20 different fairs all across the state, including two in the Upper Peninsula and the UP State Fair. We collected samples from 835 birds, which included chickens, ducks, geese, peafowl, pheasants, turkeys, guinea fowl, and turkeys. All tests came back negative for Avian Influenza except for 1, from a duck, which was typed for H5 and H7, and came back negative so no further typing was necessary. It was a low pathogenic strain so there was no need for quarantine or any further testing of the birds, we notified the poultry superintendent for that fair and the owners of the bird to let them know the result and answer their questions.

Along the way I also had the opportunity to sit on meetings, learn about foreign animal disease reporting and the many challenges of regulatory medicine. The Journal Club meetings with other students working with the Department of Agriculture and the Department of Community Health were an excellent way to learn about how surveillance systems and epidemiology are used to protect animal and public health. At my summer fellowship I met many people within the Department of Agriculture that I learned so much from and that helped me with the Avian Influenza Surveillance Program. Although, I plan on starting in private practice when I graduate this summer fellowship will help me because of what I have learned about communication and working with clients. It was also made me more aware of regulatory medicine, the importance of disease surveillance, the measures that should be taken to protect public health, and how veterinarians in private practice can work with those in regulatory medicine.
Kenny Rogers  
National Food Safety and Toxicology Center  
Michigan State University

Michigan State University was chosen to be the host site of a facility that would secure the nation’s food supply after it was recognized that the United States was ill prepared to handle potential contamination or disease catastrophes. Erected in 1992, the National Food Safety and Toxicology Center (NFSTC) comprises faculty from 19 departments within seven of the university’s colleges. The NFSTC is home to toxicologists, microbiologists, epidemiologists, and social scientists working on basic and applied dimensions of food safety. These individuals share their knowledge in collaborations across a full spectrum of disciplines within and beyond the university environment (including partnerships with government, industry, consumer representatives, and other key stakeholders) to increase the understanding of hazards in food.

My position at the NFSTC was under the direction of Paul Bartlett, DVM, MPH, Ph.D. Dr. Bartlett works on a menagerie of preventative medicine projects of local, national, and global proportions. I had three unique primary tasks.

My first assignment was to ensure that the two online summer courses Dr. Bartlett instructed were up to date and made available to enrolled students. It was my duty to open the weekly assignments, assist in student questions and concerns, and be a liaison between guest instructors and Dr. Bartlett.

The second was to write an introductory module for Dr. Bartlett’s antimicrobial resistance website. The website is currently under re-construction by Ph.D. candidate Mary Joy Gordoncillo, DVM, MS. The focus of the module was to present veterinary students a brief overview of the monitoring and surveillance protocols for antimicrobial use in equines. There currently has yet to be a national study conducted which evaluates specific antimicrobials administered to equines and their respective reason(s). However, a national study conducted by the Animal Plant Health Inspection Service, a subsidy of the USDA, did investigate the use of antimicrobials and reported the respective clinical reasons for why a drug, though not which, was given. The module is still in the editing stages and hopefully will soon be incorporated into the rest of the website.

The third, and more laborious, portion of my duties involved assisting with an acute gastroenteritis study sponsored under a National Institutes of Health Microbiology Research Unit grant. The study was labeled “defensive agriculture”
as it investigated whether a few common disease causing microorganisms in humans are human-host specific or if the strains are the same as those often found in livestock and individuals who have extensive contact with livestock. The study specifically focused on Clostridium difficile and methicillin-resistant Staphylococcus aureus (MRSA) with other microorganisms to be evaluated in the future. The forecasted outcome is that the human disease causing strains of these pathogens are actually unique compared to those naturally found in livestock and individuals who have extensive livestock contact. The participant pool consisted of 4H livestock club members and volunteers from Monroe, Clinton, and Shiawassee counties of Michigan. Participants were required to have a nasal swab obtained and submit the following items: a fecal sample from themselves and from at least one (with a second possible) livestock animal they have frequent contact with, a health survey, and documentation of which animal(s) they collected from and when. My participation involved traveling to the counties in order to present the study and distribute collection supplies. I also transported the nasal swabs to Henry Ford Medical campus in Detroit. Once the participants gathered their fecal specimens and delivered them to the county extension office, they were brought to the NFSTC where a graduate student and I prepared them for culturing at the Michigan State Laboratories in Lansing. I was personally in charge of data entry such that it could be uploaded to a statistics software program for further analysis. Preliminary results from the nasal swab cultures were fortunately made available before my fellowship ended and the study is pleased to see only one man out of over 100 individuals with extensive livestock exposure is a carrier of MRSA.

The Food Systems Fellowship Program gave me a much better appreciation for the time and detail that is necessary for a successful research program. The appreciation also extended into the importance of excellent communication as all three primary projects had several stakeholders involved and deserving of equal consideration. These are basic everyday practices that are often overlooked. If I am able to continuously have them in focus, I can be assured success when interacting with clients and overseeing bodies. Though do not see myself as a future laboratory researcher, I have affirmed my desire to obtain a MPH in conjunction with my DVM in order to have the opportunity to be involved in such studies in my career. Regardless of what path I may follow, I am grateful for this experience and sincerely thank all those who made it possible.

Paul Bartlett, DVM, MPH, Ph.D.
Leigh Lewis  
USDA-APHIS-VS  
Scrapie Program

The United States Department of Agriculture (USDA) is responsible for protecting and promoting all aspects of agriculture and natural resources in the United States. Within the USDA is a division called Animal and Plant Health Inspection Service (APHIS). APHIS is involved in regulating genetically engineered organisms, managing agriculture damages cause by wildlife, maintaining and promoting animal welfare and disease prevention and protection. Many of APHIS’s duties involving animals fall under their Veterinary Services (VS) division. Preventing, controlling and eliminating disease in animals is a major duty of the VS division of APHIS in partnership with state governments. Some of the diseases the USDA-APHIS-VS is involved in preventing and controlling in Michigan include tuberculosis, brucellosis, chronic wasting disease, pseudorabies and scrapies. The scrapie program involves a voluntary scrapie surveillance program, annual visits to sheep herds to monitor for scrapie, education for the public about the disease and a regulatory slaughter surveillance program.

My fellowship with USDA-APHIS-VS Scrapie Program began with their all area work conference. This was a four-day conference with various talks about the status of all the programs in this division of the USDA as well as the Michigan Department of Agriculture and Michigan Department of Community Health. The conference was an excellent way to orient me to the many different programs and duties involved in the VS office. Once the conference was over, it was back to the office and time to begin work. Scrapie school was first on the agenda for me. I was given a brief overview of the regulations involved in the scrapie program and the disease itself which is a degenerative neurological disease affecting the central nervous system. I learned about the voluntary program, the regulatory slaughter surveillance program as well as the trace work involved when there is a confirmed positive scrapie case.

My time was split between the office where I worked on updating the scrapie database and the lab where I helped with the regulatory slaughter surveillance program. I was given first hand experience at the lab where I learned to collect samples, which include the brainstem with obex and a retropharyngeal lymph node. The sheep heads are collected almost everyday form the eastern markets in Detroit and specimens are collected by the animal technicians working in the scrapie program. I was amazed at how many heads we sampled every week with an average of over two hundred.
In between the lab and the office, I went on farm calls involving the scrapie program as well as Tuberculosis testing, Psuedorabies testing and Wild Horse and Burro Inspections. These farm calls gave me a great overview of what it entails to be a field Veterinary Medical Officer in the USDA. I watched rectal biopsies on sheep, which are done to test for scrapie. One of the most interesting couple of days I spent on the farm was TB testing a four thousand head dairy. It was fascinating to learn how such a large operation was run and exhausting to help with the testing of such a large herd.

This summer fellowship in the Scrapie Program at the USDA was a valuable experience for me. I had very little large animal experience going into this program and no experience in the regulatory aspects of large animal production. The fellowship gave me a great overview of what my career as a large animal veterinarian could hold for me should I go into government or regulatory work. I am very grateful I was given this position and spent a rewarding summer learning about regulatory veterinary medicine and getting to know a great community full of dedicated people.
Michigan Farm Bureau is an organization with 200,000 family members and is composed of 67 County Farm Bureaus within the state of Michigan. Michigan Farm Bureau offers a variety of services to its members, including discounts and insurance. Michigan Farm Bureau members are able to participate in making public policies on all issues that affect agriculture. Michigan Farm Bureau serves as a representative of its members in the agricultural industry, and lobbies the national and state government to enact its member-driven policies. Thanks to member involvement, Michigan Farm Bureau is able to have an impact on laws, regulations, and policies that have kept Michigan’s agriculture industry strong. Currently, agriculture is the second-leading industry in Michigan.

During my Food Systems Fellowship with Michigan Farm Bureau, I can honestly say that I did a little bit of everything. My main assignment was to research animal welfare issues. Animal rights groups such as People for the Ethical Treatment of Animals and the Humane Society of the United States are gaining more power and are becoming increasingly effective in passing laws to promote their anti-animal agriculture agenda. I spent a lot of time reading various media articles on these groups and I also researched their websites to find out what actions they are currently taking. I wrote a letter to the editor of the State News (Michigan State’s newspaper) informing the public about the questionable animal rights policies of a group on campus. I also have plans to do a presentation to my fellow veterinary students on current animal welfare issues that could have drastic impacts on animal agriculture and veterinary medicine.

I also attended district policy meetings in Mesick and Ypsilanti, Michigan where Michigan Farm Bureau members met to discuss new policies. I was also able to attend various Senate Committee meetings and Agriculture Committee meetings in Lansing on issues such as water use, the gray wolf, and swine pseudorabies. Due to outbreaks of swine pseudorabies in hunting ranches and feral swine in
Michigan, the disease had the potential to spread to commercial and hobby swine farms, which could have caused a tremendous negative economic impact to the swine industry in Michigan. Some counties in Michigan, including Monroe County, where I grew up, did not allow the shooting of feral swine year-round. I contacted the Monroe County Prosecutor, William Nichols, and he agreed to allow licensed hunters to shoot feral swine year-round.

The amount of information that I have learned this summer about agricultural issues, public policy, the environment, politics, and animal diseases has been remarkable. I would highly recommend this experience to students who are looking to become more educated on these issues. I would like to become a mixed animal veterinarian, treating both large and small animals. My new knowledge will help me tremendously in talking to my future clients about agricultural issues. Many times in veterinary medicine, we are only able to help one animal or one herd of animals with our veterinary expertise. This experience has reminded me that sometimes, through working with the government, we can create a larger impact through the legislature that can maybe even affect the entire world.
NorthStar Cooperative is owned by dairy and beef producers and is made up of three departments: Select Sires, DHI Services and AntelBio. Select Sires services are available to producers in Michigan, Indiana and northern Wisconsin. Select Sires DHI services are available to producers in Michigan, Indiana, and northern Ohio and Wisconsin. AntelBio is an integrated disease testing center, with testing worldwide for Johne’s, Leukosis and BVD. NorthStar’s mission is to “Enhance producer profitability through integrated services.”

My Summer FSF Experience

For the summer of 2008, AntelBio was involved in the development of a milk ELISA for quantification of progesterone levels. The milk progesterone ELISA will be commercially available to test a herd’s compliance to synchronization programs, revealing important information to herd managers about how synchronization protocols are carried out on farm.

As the FSF intern for this project, I was in charge of sample collection, sample analysis and data analysis for the 2008 MSU Dairy Farm Trials.

To begin the summer, I was sent to producer’s farms to observe how Select Sire and DHI services are performed on farm. This experience gave me background information on the workings of NorthStar Cooperative, which would eventually aid me in implementing the use of the Milk Progesterone ELISA on farms. Early in the summer I also initiated meetings with the MSU Dairy Barn staff to discuss daily milk sample collection and with Dr. Richard Pursley, our research cohort and a dairy cattle reproduction specialist at the Department of Animal Science at MSU. Sample collection was to begin in late May.

The goal of the study was to test compliance to the OvSynch protocol that is used at the MSU dairy barns using the Milk Progesterone ELISA and compare the results to the serum RIA results collected and analyzed by Dr. Pursley. DHI composite milk samples were collected from cows enrolled in the synchronization program from the day before ovulation to 35 days after ovulation. Serum samples were collected from 15 to 35 days after ovulation by tail venipuncture. Samples were collected from late May to late August on 34 cows. Sample collection required a lot of time, patience and coordination, but I came away with good clinical experience and a better idea of what life is like on a dairy farm.
Once sample collection was complete, I began running both the milk and serum ELISAs. The procedures for these tests became very familiar to me, and the time in the lab was very enlightening. Not only did I learn about progesterone testing, I was able to observe testing for other diseases that play an important role to both dairy and beef producers and learn about the process of disease eradication on a farm. As the main lab technician for the progesterone ELISA, I also tested commercial samples for progesterone levels and participated in client education on the topic of synchronization physiology and compliance testing. I enjoyed working with producers and the NorthStar Cooperative staff to increase farm profits, efficiency and herd health. I was part of a team that personalized compliance testing for many synchronization programs, and the knowledge I gained from the experience will be useful to me and my future clients for years to come.

Analysis of the data taught me statistical skills and the importance of translating research results into a language that can be well understood by herd managers and farm employees. The results of the study solidified the use of the Milk Progesterone ELISA as a tool in testing compliance to synchronization programs and jumpstarted the commercial launch of the service.

The experiences I had with AntelBio have helped shape my future in veterinary medicine. I have learned more about the progesterone cycle and synchronization protocols than one cares to remember, but that was not the most valuable education I received this summer. The lessons I learned about communication with producers, other veterinarians and food animal specialists will help me educate my future clients about new aspects in the industry that can increase their profitability and herd health. The practical experience I gained from this internship will be valuable in my near future, but the networking and grasp I have gained in regards to these integrated dairy and beef services will be with me throughout my career.
Michigan Milk Producers Association is a member owned and operated dairy cooperative serving over 2,300 dairy farmers in Michigan, Ohio, Indiana and Wisconsin. Established in 1916, MMPA is the largest dairy cooperative in Michigan. MMPA guarantees a market and payment for members' milk and any profits gained through the marketing of the milk are returned to the entire membership. MMPA manufacturing plants are capable of producing high quality milk, dried buttermilk, butter, cream, condensed milk, and instant nonfat dry milk. MMPA has three certified laboratories for the analysis of quality and safety, trained field staff, and premium programs that evaluate somatic cell and raw bacteria counts, drug residues, and freeze points. All decisions made by this cooperative are not only for increasing profits for the members, but to make a better way of life for dairy farmers.

My role with MMPA this summer has been a dynamic one. The main project involved traveling to dairy farms around Michigan and Indiana and administering a survey and compiling the results. The survey was designed to be an anonymous compilation of the opinions of MMPA's Milking System Performance Assurance Program (MSPAP). This program is a way for producers to get their milking equipment evaluated by a trained MMPA field representative so that problems with the equipment can be detected early on and potentially costly issues can be fixed.

At the beginning of this summer, I spent time with field representatives and learned about the different services offered to dairy producers. I helped with several farm inspections, learned the basics of milking equipment mechanics and how it is evaluated and the data analyzed through MSPAP, and even milked some cows during a herd test. I was able to tour MMPA's headquarters and laboratory and visit several manufacturing plants. I participated in meetings where I learned about emerging disease awareness and planning, animal welfare, waste water treatment options, Michigan Agriculture Environmental Awareness Program, issues of the Agriculture Electrical Council, and MMPA's Advisory Committee and Board of Directors.

The rest of my time was spent meeting different dairy producer and touring their farms as I learned about their opinions of MMPA and MSPAP. I enjoyed my time driving on dirt roads and seeing the differences in production set-ups and learning about how much MMPA and its programs help make farms ranging from the Upper Peninsula down to Indiana so successful. Through the surveys, I
learned that many producers rely on the Milking System Performance Assurance Program to detect problems in their milking equipment. With so many other factors to monitor on their farms, producers properly place a great deal of trust and responsibility with MMPA.

As a future large animal veterinarian, this Summer Food Systems Fellowship with MMPA has been an invaluable experience. With an Animal Science degree as my only major agricultural background, I have learned much more about the dairy industry and the many economical, environmental, and production issues producers face today. I understand how milking equipment operates and the cow health concerns that can be avoided by proper maintenance and evaluation of equipment. Once foreign words such as somatic cell count, raw bacteria count, pulsators, bulk tank, receiver, and inflations have now become part of my working vocabulary. After traveling to so many farms and meeting people, I am now confident in talking to producers about their farms and equipment and the health and well-being of their cows. This program has given me the opportunity to gain practical background and understanding of the goals of a dairy producer and the role MMPA plays in the milk market and the role I will play as a veterinarian.
Lindsay Weaver  
Pfizer Animal Health

Pfizer Animal Health is the world’s largest animal health company. It is based out of Kalamazoo, MI with its research farm located in Richland, MI. PAH currently employs over 4000 colleagues worldwide with 700 of those devoted to veterinary research and development. They currently have products available for livestock, poultry and companion animals.

“We see a future where our Animal Health products and services are ensuring a safe and adequate food supply for a growing world and delivering innovative health care solutions for companion animals.”

My summer at Pfizer has afforded me many opportunities that I would not have been able to gain elsewhere. While I am unable to discuss specifics on the projects in which I was involved I can tell you that I learned that research is much more than mice and rats in labs. I was able to gain a tremendous amount of experience in a production animal research setting.

Because my goal was to obtain an agricultural animal experience, my internship took place at the Pfizer Richland Farm site. Most of my time was spent with dairy, beef, swine and horses. I did help occasionally with dogs and cats, but my supervisors tried to limit my time there, as they knew I was primarily interested in production animals.

I spent a considerable amount of time in a BSL-2 building where showering in and out was required. At first the numerous showers didn’t seem too appealing, but you soon take them in stride as part of your normal routine. I would sometimes take up to six showers a day in order to follow the veterinary staff and observe the animals.

During my internship I was able to gain invaluable hands on experience such as jugular venipuncture on horses, tail bleeding on dairy cattle, and jugular and tail bleeding on beef cattle. For one study I was required to help milk cows in the dairy, which was a great experience and made me realize that I would be more interested in working on dairy cattle than I previously thought. I was even able to make trips to a 3000 head dairy in Michigan to help with the prestudy screening of these cows.
I truly believe that the people you work with can make or break an experience for you. At Pfizer, the people I worked with did everything they could to ensure that I had a fulfilling, positive experience. I never felt like “just the intern” who was supposed to stand back and observe. Everyone did their best to make sure I was able to gain the experience I wanted and help out when I could on studies.

Saying that I would recommend this experience to future applicants would be an understatement. I could never replace the experience I gained this summer or the friendships and connections I made. The fact that the intern who held my position the year previous to me returned, and that I am hoping to return next year proves that Pfizer is an excellent work place where future Food Systems Fellowships participants can gain a wealth of knowledge. I now realize that industry is a part of veterinary medicine that I find extremely interesting and would enjoy working in someday.
Swine Pre-Harvest Food Safety Project
Stacia Belda, Nina Duflo, Jessica Seate

Who we worked for and what they stand for/do:

Julie Funk, DVM, MS, PhD is Associate Professor in the Department of Large Animal Clinical Sciences and Director of the Online Professional Master of Science in Food Safety in the College of Veterinary Medicine at Michigan State University. She received the DVM from Michigan State University after which she practiced in a predominantly swine focused veterinary clinic in Wolcott, Indiana. After 2 years of practice she returned to academe and received a Master of Science from the University of Illinois and a PhD from North Carolina State University. Both of the graduate programs were focused on the pre-harvest epidemiology of food borne pathogens in swine populations. Prior to joining Michigan State University, she was an Assistant Professor at The Ohio State University’s College of Veterinary Medicine. Her current research focus remains in pre-harvest epidemiology of food borne pathogens in swine (Salmonella, Campylobacter and Yersinia enterocolitica) as well as understanding the epidemiology of antimicrobial resistance pre-harvest.

Summer 2008:

Salmonella Research – This summer team poop consisted of Stacia Belda, Nina Duflo and Jessica Seate. We worked for Dr. Julie Funk through the NFSTC. During our time here we ran a research project looking for Salmonella in finisher pigs at 2 different farms. Our project looked at the levels of Salmonella being shed in the pig’s feces in relation to different barn temperatures. Every other week we collected 50 fecal samples from each farm, these samples were sent to the DCPAH to record the Salmonella levels found.

We were also privileged in being able to ride along with Dr. Jim Kober several times a week this summer. Our experiences with him this summer included: herd health checks, slaughter inspections, drawing blood for diagnostic testing, spinning and packing blood and breeding soundness exams. The FSF program also gave us the opportunity to develop our own research projects as well.
Jessica Seate’s project- Salmonella Rope Research

My project focused on trying to find an inexpensive approach for swine farmers to test their herd for salmonella. I used the same two finisher barns in Dr. Funk’s research. I tested 24 pooled pens in the barns, where I would hang two ropes per pool. The ropes were hung so the pigs could chew them in order to collect salvia to do salmonella culture testing. The results from the salvia culture test are being compared to the feces culture test (from Dr. Funk’s research) in order to determine the proportion of positive pools for salmonella and if this technique could in fact be implemented at the herd level. My study has not been finished yet. Blood samples were also collect for a future study comparing the antibodies of salmonella in blood and the salvia. The FSF program gave me the opportunity to do my own research and that has led to me now completing a DVM/MS in Large Animal Clinical Sciences.

Nina Duflo’s project - PCV2 Vaccination Trial

My project was a vaccination trial using two different vaccination protocols to see the effects they had on average daily gain and mortality. Three groups of 105 piglets were separated and either vaccinated with an Intervet or Boehringer Ingelheim product. The third group was left unvaccinated. The point of this study was to determine the best product for this particular breeding farm so their ADG would be increased and mortality decreased due to PCV2. This study has not been finished yet.

Stacia Belda’s project - Barn environment effects on pig performance

Two different types of finishing barns were used in this project to evaluate the correlation of barn temperature with pig performance. Daily gain, mortality, cull rate, and feed efficiency were all measure and compared to daily temperatures. The purpose of this study was to compare two different barn setups and to determine what improvements in ventilation might be beneficial to performance records.

Our fellowship this summer really opened the doors into the swine industry for us. We gained a lot of knowledge and experiences that were unavailable to us before. These experiences have motivated us to pursue careers in the swine industry one day.
With offices in more than 50 countries serving over 140 markets worldwide, Intervet/Schering-Plough Animal Health is one of the leading companies in the animal health industry. A recent merger of Intervet Pharmaceuticals and Schering-Plough Animal Health has combined some of the world leaders in the field of veterinary medicine and animal health. The integration of the two companies has served to increase the spectrum, quality and development of products through diversity of ideas and resources.

Intervet/Schering-Plough Animal Health is improving the industry by providing innovative, high quality products that develop and grow with the needs of the animals and the people that act as stewards for the agricultural and companion animal industries. As leaders, Intervet/Schering-Plough Animal Health recognizes its responsibilities to the global community and to the environment that sustains both humans and animals. Just as all professionals in this field Intervet/Schering-Plough Animal Health strives to earn trust and respect of the global community as stewards and as partners in industry by providing safe and effective products.

Intervet/Schering-Plough Animal Health allowed me the opportunity to see the diverse nature of veterinary medicine and specifically production medicine. My first week of summer was spent on farms in Michigan and Indiana with a representative of Intervet/Schering-Plough, as well as a Pulse needleless injection system representative. As well as learning a great deal, I was able to assist in educating producers on new technology of pneumatic/needle-less injection from the standpoints of animal health, meat quality and convenience. From there, I
traveled to Kansas and had the opportunity to observe the final stages of vaccine development and plans for continued study of pharmaceuticals before the official launch of Onset 5, Intervet/Schering-Plough's newly released 5-way intranasal vaccine.

From Kansas, I traveled to New Mexico in order to collect data from a feed additive trial and computerize it for comparison. I also had the opportunity to spend several days in Tyson's Amarillo, Texas facility following cattle from a feedlot through to boxed beef. I was able to observe the entire process including USDA inspection of viscera, carcass grading and random quality test sampling. A large portion of my summer was also spent in Idaho assisting with a vaccine trial. I helped to monitor study sites, assist in the implementation of protocols, and identify possible problems in data collection and bio security.

Through my partnership with Intervet/Schering-Plough Animal Health I was able to connect with some of the top members of the veterinary profession. I experienced many different sides of the industry in a very short time span, from marketing, corporate development, research, and public health to working on the farms, and in the feedlots, with producers one-on-one, to educate and improve the industry. This fellowship has allowed me to build my knowledge base and confidence, I now feel that I am able to rationally incorporate techniques and apply what I am learning in the classroom to practical situations. The lessons I have taken from the veterinarians, researchers, producers, and the contacts I have made will stay with me throughout my career.
Katie Laudicina  
Michigan Department of Agriculture  
Animal Industry Division

The Michigan Department of Agriculture (MDA) envisions its role in our state government as one that serves “To protect, promote and preserve the food, agricultural, environmental and economic interests of the people of Michigan.” Within MDA, the Animal Industry Division (AID) carries the responsibility of controlling and eradicating reportable contagious, infectious, and communicable diseases of livestock, poultry, equine, and companion animals. AID is also responsible for controlling the contamination of animals from toxic substances, enforcing and supporting the humane treatment of animals, and promoting Michigan animal industries.

My original job description with MDA AID had revolved around bovine tuberculosis (bTb) and working underneath Dr. John Tilden, Bovine TB Program Director. However, that all quickly changed when pseudorabies (PRV) was found in transitional swine on a game ranch in Saginaw County on May 2, 2008. Suddenly I found myself agreeing to spend the first thirty days of my fellowship working with PRV instead of bTb. Looking back, that one decision helped create an amazing summer full of very unique experiences.

After the initial diagnosis of PRV in Saginaw County, three other facilities with transitional swine turned up positive. In order to eradicate PRV from these premises and thus prevent PRV from spilling over into commercial herds, MDA implemented the Incident Command System (ICS). I had the opportunity to sit in on a number of ICS meetings that displayed the many challenges, which develop throughout the course of implementing such a program when under pressure. Veterinarians, epidemiologists, wildlife biologists, and other additional staff personnel from MDA, USDA Veterinary Services, USDA Wildlife Services, MI Department of Natural Resources, and Michigan State University Extension all had a role within this particular ICS. As we waited for the Incident Commander to develop a PRV action plan, I spent some time becoming acquainted with the role of a field vet for MDA. Dr. Susie Baer became a mentor of mine as we hopped into her truck each morning and drove around the state practicing regulatory medicine. A few of the highlights included placing a quarantine and doing an epidemiological investigation on an Amish kennel that had turned up positive for Brucellosis, and visiting the Lake Odessa sale yards.
Once a PRV action plan had been put in place, Dr. Baer, myself, and my fellow MDA AID interns hit the road to begin our surveillance duties in Saginaw County. We were required to find and quarantine every hog within a five-mile radius of the PRV positive premise. This consisted of numerous hours in the car, consulting our maps, driving from house to house looking for pigs. When all hogs within the circle were identified, appointments were then scheduled with either an MDA or USDA field vet to return to the premise and draw blood for laboratory testing to determine if these animals were also PRV positive. Throughout testing, I served as a tech for Dr. Baer. We visited a number of farms in a variety of conditions in order to collect all the necessary blood. Perhaps the most important skill I took home after all our testing trips was the ability to snare hogs. My reflexes are much quicker now!

In order to complete the final phase of PRV eradication and control, all PRV positive swine were required to be depopulated. My fellow intern and I had the opportunity to help out on three of the four “depops”. Now that was a good time! We waded through mud, pushed hogs through the woods, watched deer and elk run around us, witnessed wild boars up close and personal, sat alongside USDA sharpshooters, and have many more memories of an experience not normally found in the vet school curriculum!

As matters finally settled on PRV, I went back to my original task of working on bTb. Dr. Tilden and I created a project that would allow me to become more involved with the bTb positive farms in our Modified Accredited Zone (MAZ). My goal was to complete two case studies on previously infected herds. The farms chosen were located in Alcona County and were only a ½ mile apart from each other. One had been twice infected while the other had been infected only once. The purpose of these case studies was to look at potential environmental and management factors of the twice infected farm and compare those to the neighboring once infected farm, thus being able to better define the risk factors for spreading bTb between wildlife and cattle.

My case study research allowed me to work out of MDA’s Atlanta office, which is right in the heart of the MAZ. I took several trips up north to work alongside multiple MDA and USDA field vets. They were able to fill me in on important details regarding the bTb positive farms they were most familiar with. I used this information along with the quantitative data I gathered from each farm’s file within the Lansing and Atlanta MDA offices to complete my case studies. Another highlight of my time spent up north was having the opportunity to visit with the two farmers my case studies focused on. Here we had the chance to speak one on one and I was able to gain a true insight into the life of a producer in the MAZ. The information I obtained from those two meetings became a vital aspect to my research.

By the end of the summer, I had developed two sufficient case studies that could be given to external stakeholders and other opinion shapers within the industry.
My work led me to the conclusion that the two farms I focused on had very different environmental conditions and management styles. However, the key lies in how each producer manages these risks. The twice-infected farm suffers from a more challenging terrain and a less defined set of management skills. The once infected premise runs a solid operation with a stronger implementation in reduction measures that have been ingrained into their management practices well before becoming bTB infected. My recommendations for the program include enforcing regulatory herd plans with scheduled verification visits by a government employee; realize that a stronger sociologic approach needs to be taken to motivate producers to implement reduction measures; and consider increasing producer incentives (i.e. require paying for testing, RFID tags, reduce indemnity when re-infection occurs, etc.).

My time spent with MDA AID was extremely valuable to my development as a future large animal veterinarian. I was definitely in the right place at the right time when it came to PRV. By agreeing to deviate from my original plan on working solely with bTB, I had the opportunity to experience how the government deals with the diagnosis of an infectious disease from start to finish. Although I spent some time in the office while ICS was being developed, the majority of my time was spent in the field getting my hands dirty. To me that was an ideal situation. I also had no prior experience working with hogs, so again it was another perfect opportunity to develop that side of my animal handling skills. The remaining time I spent on bTB was also unique to my veterinary development. By spending time in the MAZ, I finally had the chance to truly understand the bTB situation and how producers struggle to remain in business and continue in their agricultural traditions when constantly threatened with the possibility of infection. I was involved in the testing process, saw how the diagnosis of a bTB positive premise was dealt with in Lansing, and learned how producers are attempting to reduce their risks. I believe both of these experiences and the insight I had into regulatory medicine will help me become a well-rounded veterinarian and I look forward to using the skills I've gained in practice!
Thanks to our partners.