

Testimony Before the Joint Higher Education Appropriations Committee

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February 29, 2016

Dr. Dwyer:

Thank you for inviting us here today. I am eager to share with you the research and outreach that MSU Extension and AgBioResearch provide throughout the state. The very nature of our organizations means that we are present in all communities throughout the state. And while we provide a variety of educational programs that have wide impacts, we can also respond to very specific needs of residents, businesses, farms and communities as necessary.

As you know, we took a significant hit to our budget in 2011 when our state allocation was reduced by 15 percent. We are grateful that Gov. Snyder's proposed budget includes an increase of 2.3 percent for MSU Extension and MSU AgBioResearch. However, every budget since 2011 proposed by this governor has recommended that our two organizations receive the average increase recommended for all of higher education. This year that figure is 4.3 percent.

And as we've done every year for more than 100 years, both of our organizations have brought new resources, partnerships and innovations to Michigan residents. Dr. Smith and I would like to share with you some of our high-impact outreach and research from the last few years. There is more detailed information about all of these programs in the transcript in your packets.

Flint Water Crisis

Certainly our most visible work of late is our response to the water crisis in Flint. I am pleased that so many organizations have rushed to the aid of Flint residents. But we didn't have to hurry. We were already there with 15 education professionals in the MSU Extension Genesee County office, and many more who deliver programming on a regular basis. Because we are a nimble organization, our staff members are quickly able to mobilize resources and adjust programming to match ever-changing local needs. For example:

- Since October 2015 we have provided nutrition education focused on reducing the effects of lead exposure to more than 13,000 Flint families. We anticipate reaching an additional 25,000 families with this information before the end of the first quarter of 2016.
- Through our participation in the Pediatric Public Health Initiative, we have partnered with Hurley Children's Hospital to offer cooking demonstrations at the Flint Farmers' Market. The recipes used feature easily sourced ingredients that are high in iron, calcium and vitamin C — all of which fight lead absorption in the body.
- We're helping families learn how to purchase and prepare healthy foods through the Supplemental Nutrition Assistance Program (SNAP). This \$8 million grant helps us leverage state funds to deliver lifelong education to Michigan's most vulnerable populations.

- We use social media, especially Facebook, to push out key nutrition information and help link people to more in-depth resources.
- We're partnering with local schools to do Smarter Lunchroom assessments. If you have kids, you know that dictating good nutrition often fails. The Smarter Lunchroom program uses behavioral insights to nudge students toward making healthier food choices.

In January, Deanna East, a longtime MSU Extension leader, began working in Flint full-time to identify issues and find opportunities for our staff members to help with local issues.

The Flint water crisis is obviously a public health concern, so it's only natural that our health and nutrition staff members are keenly focused on this issue. However, staff members who work in other areas have also adapted their programming to help Flint residents solve critical problems that have cropped up as an offshoot of lead in their water.

- MSU Extension staff members have modified our Master Gardener training classes to include information about how to continue to grow healthy foods in soils with suspected lead contamination.
- We're also continuing our long-standing relationship with Edible Flint, a group that supports Flint residents who want to grow their own food. In fact, on March 1, our staff members are taking part in a neighborhood engagement hub to talk about what the Flint water crisis means for gardeners.
- Members of a 4-H dog club that meets in north Flint are concerned about the effects of lead exposure on animals. So we're gathering information to help them identify and lessen the risks of lead poisoning in pets. The same is happening at our 4-H rabbit and cavy (guinea pig) community meetings.
- Our 4-H staff members have had a strong partnership with Eisenhower Elementary School since 2014. Recently our staff members have expanded their presentations to talk about how good nutrition is key to reducing the risk of lead exposure. They also shared some simple recipes that are high in iron, calcium and vitamin C.
- Our early childhood educators have developed information about combating the effects of lead through learning and play.

MSU Extension is proud of our educational role, and we're also proud of our ability to bring together the right group of people to address important emerging issues. For example, thanks to the wonderful generosity of the Michigan Milk Producers Association, Kroger and the Food Bank of Eastern Michigan, we were able to get 12,000 gallons of milk to people in Flint who desperately need added calcium in their diet. We're also working with other food-producing organizations throughout Michigan to determine how we can work together to make a difference.

Avian Influenza

I also want to talk to you about a crisis that didn't happen in Michigan. You may know that 2015 saw the biggest animal health crisis in the history of our country. Highly pathogenic avian influenza killed more than 60 million domesticated birds, mostly in Iowa, Minnesota and Indiana. Michigan, however, remained relatively unscathed by this deadly virus. Thanks to our strong partnership with

the Michigan Department of Agriculture and Rural Development, we were able to communicate the urgency of pristine biosecurity with backyard flock owners throughout the state. We did it by making 4-H families a part of the solution.

Dr. James Averill, the state veterinarian, cancelled all poultry shows, exhibitions and swap meets on June 1, 2015 — just one week before the start of Michigan's first county fair. Such a bold yet necessary move had the potential to throw backyard flock producers into a tailspin. However, rather than forcing the roughly 4,100 4-H'ers enrolled in poultry science projects to scrap all the hard work they had done preparing for the summer shows, our staff members created alternative activities that allowed them to show off their knowledge without comingling birds.

- We supplied each fair with a scientific model of a chicken so they could participate in showmanship.
- We gave 4-H'ers and fair organizers a list of activities they could use to demonstrate their knowledge and skills, including alternative breed and showmanship classes, supplemental poultry-related contests and activities, and processes for selling market projects. Alternative activities were carefully vetted by staff to ensure proper biosecurity practices would be followed and state regulations regarding meat processing and sales were met, while ensuring youth would have a positive experience.
- We created guidelines that allowed 4-H'ers to sell their meat birds at regularly scheduled fair auctions without exhibiting live birds, and provided talking points that assured buyers that all properly handled poultry remains safe to eat.

Instead of turning this into a crisis for 4-H families, we helped make them ambassadors of the poultry industry. These young people learned more about biosecurity and disease transmission than they ever dreamed. They encouraged their friends who didn't have birds to participate in educational activities. And they became spokespeople for the industry. When fair goers asked why there were no live bird exhibits on the fairgrounds, our 4-H'ers were there to answer questions and discuss biosecurity and safe poultry handling and cooking practices.

Preparation for lifelong learning

This is just one of the many great learning experiences that 4-H offers to young people. Our MSU Extension 4-H programs help youth obtain critical life skills, gain new content knowledge and see themselves in a bigger context than their local community. In addition, it prepares them for lifelong learning, starting with postsecondary education.

- Studies show that Michigan 4-H youth enroll in college at a significantly higher rate than their same-age peers. Since 2009, an average of 61 percent of Michigan 4-H youth enrolled in college the fall following high school compared to just 45 percent of their peers.

Simply put, 4-H prepares youth for long-term success.

Metric goals

We don't present this information in a vacuum. You have asked us to show growth in several areas by noting it in the legislation itself. I'm pleased to report that we have exceeded your goals again.

MSU Extension increased total connections, including our electronic and digital outreach, by 28 percent. We did it by reaching residents where they are using online courses, electronic newsletters, and digital, social and traditional media in addition to our traditional face-to-face trainings. You can see more details on page 4 of the annual report found in your packets.

The MSU Product Center grew its client base of food and agriculture businesses by 6 percent. The MSU Product Center is emblematic of the way MSU AgBioResearch and MSU Extension work to invest in people – one-on-one with entrepreneurs to supply objective, evidence-based methods for starting and growing businesses. In the 2014-15 programming year, Product Center professionals conducted nearly 6,000 counseling sessions with 625 clients, resulting in the launch of 61 new ventures and 175 jobs. In addition, they helped create more than \$8.2 million in total capital formation, including more than \$7 million of owner investment in Michigan businesses.

You also asked us to increase our external funding by 10 percent over three years.

- Since 2012-13, we have increased external funding from \$92.5 million to \$135.2 million – an increase of 32 percent.
- During difficult financial times, we have seen increased investments from our county partners to MSU Extension — an increase of more than \$1.6 million since 2012. This is a testament to the value of our programming to residents throughout the state.

We're proud MSU Extension has helped communities solve critical problems and increased our financial health. Needless to say, we couldn't do that without the strong research conducted by MSU AgBioResearch.

Dr. Smith

The current need for targeted research and outreach is arguably at an all-time high. With emerging threats such as antibiotic resistance, bovine leukemia, invasive pests and avian influenza, agriculture producers are faced with a plethora of on-farm issues, many of which have human health implications.

MSU researchers and Extension specialists are valued within the agriculture community for providing science-based knowledge in an effort to improve food and quality of life, as well as generate economic viability and sustainable practices. Some recent examples include:

Shielding the fruit industry from invasive pest: MSU entomologists are studying new ways to combat a highly destructive invasive fruit pest called spotted-wing drosophila (SWD). These insects are able to cut into unripe fruit and lay their eggs, creating the possibility of live larvae inside fruit at harvest. Their efforts have:

- Supplied Michigan growers with information on the most effective insecticides, sprayers and non-chemical controls to limit SWD.

- Led to the identification of biological controls and biopesticides, and to developing additional control methods.
- Brought growers and consultants together for hands-on demonstrations and presentations on the latest research and management techniques.

Developing guidelines for ready-to-eat fruits and vegetables: MSU food science and human nutrition expert Elliot Ryser is leading a multidisciplinary team to address fruit and vegetable contaminants such as *Salmonella* and *Listeria* to enhance the safety and quality of ready-to-eat, fresh-cut produce. The project aims to:

- Identify commercial slicing and dicing practices that increase risk for cross-contamination of fresh-cut produce, along with various mitigation strategies.
- Develop novel packaging strategies for minimizing pathogen growth and survival in the cold chain.
- Reduce risk of food-borne illnesses from fresh-cut produce through training activities aimed at processors, retailers, food service workers and regulators.

Training researchers to assess dangerous microbes: MSU researcher Jade Mitchell has developed a training program to help quantitative scientists and engineers connect with social scientists and biologists to conduct better quantitative microbial risk assessments (QMRA) impacting health and the environment. QMRAs are critical tools in developing plans to protect the public from exposure to dangerous pathogens.

- QMRAs allow the formation of cohesive strategies to respond to the threat of emerging diseases, outbreaks and emergencies that impact the safety of water, food and air resources.
- QMRA training aids the development of One Health, a national initiative that tracks the health of people, animals and the environment.
- Participants in the QMRA training program learn from leaders in the field.

Learning more about diabetic vision loss: MSU researcher Julia Busik is building a better understanding of the mechanisms that drive diabetic vision loss. She has linked the condition to an abnormal concentration of fatty compounds in the blood that causes retinal damage and reduced performance of circulating cells, which repair retinal tissue damage. She is also investigating nutritional interventions to reduce this elevation in fatty compounds.

- 29 percent of diabetics over age 40 will experience diabetic vision loss.
- The National Eye Institute expects cases of diabetic retinopathy to double by 2050.
- Diabetic retinopathy costs the nation approximately \$500 million annually.

Delaying fruit bloom to avoid severe frost damage: Ongoing research is examining a mist cooling system to delay bloom and reduce the risk of frost damage in apples and cherries. Applying water with conventional sprinkler systems during the late stages of dormancy and early vegetative stages has been shown to reduce vulnerability to frost damage.

- Mist applications during two growing seasons delayed bloom of apple and cherry by 5 to 11 days.
- Spring frost damage was less.
- No increased disease or fruit set problems occurred.

Curtailing aggressive animal behavior on swine farms: Fighting, a common behavior in groups of pigs, poses serious risks such as injury, infection, stunted growth and failed pregnancies on pork farms. MSU researcher Janice Siegford is leading a multidisciplinary effort to find ways to curb fighting and enhance productivity and quality of life.

- Scientists are figuring out whether or not these aggressive behaviors in pigs are heritable and if they can select genes through breeding that show improved behavior and less fighting.
- The Michigan pork industry is valued in excess of \$362 million.
- Pork is the third most popular meat in the United States.

These are just some of the advancements within the past year. As you can see, we're on a steady roll. This fast pace is necessary in order to provide solutions to meet the growing world population and the need to double the world food production by 2050. That is, no question about it, an extremely tall task.

Generating economic impact

The state's food and agriculture industry is a cornerstone of the economy -- valued at more than \$101 billion of annual economic impact and close to 1 million jobs. And the contributions from MSU in terms of education, research and outreach have been vital in meeting and exceeding Governor Snyder's five-year goal to increase economic impact of the Michigan food and agriculture industry, and critical to the future of the agricultural economy.

AgBioResearch and Extension continue to leverage the funding you've allocated in the past. In FY 2014-2015, the state's \$56.6 million investment in AgBioResearch and Extension generated a total impact of more than \$1 billion for Michigan residents. That same investment yielded about \$865 million the previous year, so we're on the upswing. You've made great decisions investing in us in the past. That's why we're a little baffled by the governor's budget recommendation for our two units.

Gov. Snyder's budget recommendation is to increase funding for higher education by an average of 4.3 percent. For AgBioResearch and Extension, that increase is just 2.3 percent. This comes at a time when we've been told by the Michigan animal agriculture industry that research and outreach is inadequate. They need more and attribute the current gaps as a major reason holding back one of the brightest sectors of our state's economy.

For instance, the pork industry is a perfect example. Construction of a new \$255 million processing plant in Coldwater, Michigan, is projected to more than double the economic activity within the Michigan swine sector to \$1.7 billion and contribute 8,500 new jobs. Furthermore, the facility provides a catalyst for potential growth of the swine industry, which projects production will need to double to meet the new processing capacity. These efforts need our research and outreach support.

The dairy industry is another fine example. It is the state's largest agricultural commodity, contributing more than \$14.5 billion annually. Nationally, Michigan has ranked first in the U.S. in gross revenue per dairy cow, third in milk production per cow and consistently ranked in the top

eight states in milk production. However, significant challenges limit further growth and sustainability.

It is clear that the Michigan animal agriculture industry could use additional support and assistance, not less. This is not only at the state level but also at the national level. Animal agriculture research receives less than .03 percent of total federal competitive grant programs. That's less than \$50 million and nowhere near enough to meet industry needs. And MSU faculty members have had more than \$111 million in unfilled research, education and Extension requests since 2013. And those projects typically are funded for more long-term fundamental types of research, which does not address the issues our producers face each day in their operations.

Statewide investments in animal agriculture have generated more than an estimated \$89 million in industry impact and \$65 million in economic contributions since 1994. These growers collectively contribute more than \$4.7 billion of economic impact each year. This level of contributions deserves better than the two-decades-old funding model we used in the past.

Responding to industry needs

In 2013, MSU AgBioResearch and Extension took innovative steps to address industry concerns regarding sizable needs for animal agriculture research and outreach that could be implemented on farms across the state. We joined with the following commodity organizations to form a new initiative known as the **Michigan Alliance for Animal Agriculture (M-AAA)**:

- Michigan Allied Poultry Industries
- Michigan Cattlemen's Association
- Michigan Farm Bureau
- Michigan Horse Industry
- Michigan Meat Association
- Michigan Milk Producers Association
- Michigan Pork Producers Association
- Michigan Sheep Breeders Association

This partnership, which includes a competitive grant process, is modeled directly after Project GREEN, which addresses research and outreach needs within Michigan plant agriculture sector. As with Project GREEN, M-AAA enhances the sustainability and economy of the Michigan agriculture industry by providing research, engagement and outreach to producers. Some critical issues we're addressing include:

- Emerging and persistent infectious diseases (e.g., avian influenza, bovine tuberculosis, porcine epidemic diarrhea virus, equine herpes virus).
- Nutrient management.
- Water quality and conservation.
- Energy efficiency and production.
- Production efficiency and profitability.
- Market development and expansion.
- Improved and sustainable production systems.

- Food safety, security and quality.
- Antimicrobial resistance.

M-AAA has helped lay the groundwork for some important research, including: Animal science research and Extension specialist Wendy Powers efforts is examining ways to help producers limit and better control air emissions from their farms and livestock facilities. MSU Extension specialist Darrin Karcher's studies of is studying the impact that aviary housing systems have on egg quality and animal safety. Biosystems and agriculture engineering scientist Steven Safferman's investigations of the transport and fate of nutrients from winter manure applications.

These small funding opportunities also allow researchers and Extension specialists to seed projects at the local level that have the potential to eventually garner funding on a larger scale. But these endeavors — \$25,000 to \$50,000 per grant — are simply not enough.

Investing in the future

The USDA Economic Research Service estimates that every dollar of research investment generates up to \$10 of long-term economic benefit through productivity gains. Previously, projections suggested that Michigan could potentially grow its overall annual animal agriculture economy from \$5.7 billion to more than \$8.1 billion by 2025.

We're here to ask that you reconsider the recommended 2.3 percent increase for AgBioResearch and MSU Extension, and consider providing us the 4.3 percent increase average that all other public universities in Michigan are receiving.

The Michigan animal agriculture industry needs our assistance. This additional funding will be earmarked and allocated to directly meet the needs of the animal agriculture industry. Some of these producers are here with us today and will speak next.

Let's work together to give the industry what it deserves to be able to expand, create jobs and feed the growing world population. Together, we can keep research and outreach moving at a good pace and help boost our animal agriculture industry into the 21st century. If you restore our funding to the average of higher education, we will allocate the additional funds directly to meet the research and outreach needs of the Michigan animal agriculture industry.

Thank you.