



Written Statement for the Record of

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Foundation for Food and Agriculture Research**

Before the

U.S. Senate Committee on Agriculture, Nutrition, and Forestry

Hearing on

***Agricultural Research: Perspectives on Past and Future
Successes for the 2018 Farm Bill***

June 15, 2017

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Introduction

Chairman Roberts, Ranking Member Stabenow, and Members of the Committee, I am Dr. Sally Rockey, Executive Director of the Foundation for Food and Agriculture Research, and I am honored at the opportunity to testify as you continue discussions for the next Farm Bill. The Foundation for Food and Agriculture Research is an independent 501 (c) (3) nonprofit organization established with bipartisan Congressional support in the 2014 Farm Bill to serve as a new model in our nation's mission to be the global leader in food and agricultural sciences. Rather than repeat what others do, FFAR makes progress in seven strategic areas by finding critical gaps in research and accelerating problem solving using a new model in partnership and program design and delivery.

Much like President Abraham Lincoln referred to the U.S. Department of Agriculture (USDA) as the People's Department upon its founding in 1862, I believe FFAR is the People's Foundation. The Foundation belongs to everyone in the food and agriculture community, especially to our farmers and ranchers.

To the members of this committee who were so instrumental in establishing FFAR, I thank you on behalf of the entire food, agriculture and scientific communities. I look forward to the opportunity today to provide an update on FFAR's progress, give an overview of what lies ahead for the Foundation, and to demonstrate that FFAR remains worthy of this Committee's full support in the next Farm Bill.

FFAR is a New Model in U.S. Agriculture Science and Research

At FFAR, we envision a world in which ever-innovating and collaborative science provides every person access to affordable, nutritious food grown on thriving farms. FFAR's aim is to fund innovative and applied sciences that help to increase access to food, support producers and the agricultural economy, and foster environmental resilience. Additionally, FFAR builds unique partnerships that can address the most pressing challenges in food and agriculture. From the lab, to the farm, to the boardroom, the Foundation delivers solutions-based science that empowers and safeguards our nation's economic and national security while providing a significant return on the taxpayers' investment.

We are not a government agency, although USDA is our closest partner. Instead, the work we do complements scientific programming carried out by the USDA. Nor is FFAR a completely private entity, although we partner frequently with the private sector to respond rapidly to emerging challenges that can be addressed through research.

Thanks to this Committee's forethought, FFAR is something brand new for the agricultural arena. Designed to foster public-private partnerships meant to deliver bigger bang for the taxpayer's buck, FFAR is perfectly positioned to put America back on top as a global leader in agriculture R&D by accelerating problem solving on behalf of U.S. agriculture.

FFAR matches every program dollar with outside funding, delivering huge value for American taxpayers. Every \$1 contributed by FFAR has been more than doubled by our funding partners. In other words, the U.S. government's \$200 million investment in FFAR will eventually deliver more than \$400 million in programming.

We have also formed a diverse and esteemed Board of Directors led first by Dan Glickman, former Agriculture Secretary, and now by Dr. Mark Keenum, president of Mississippi State University. In 2016, we expanded the Board by adding six new positions. Today, the Board of Directors includes 19 voting members and five ex-officio members designated by Congress, none of whom receive compensation for their positions.

FFAR's non-voting ex officio members, including Agriculture Secretary Sonny Perdue, are the stewards of the Foundation's close partnerships with the National Science Foundation and the USDA. Specifically, these members provide insight into the federal research enterprise and ensure that FFAR's work complements USDA and NSF research.

The Foundation has also established six Advisory Councils to provide guidance on program development and implementation, potential partnerships, and other matters of significance across our research portfolio. Advisory Council members are leaders in their respective fields with expertise and experience spanning the food and agriculture industry from both a scientific and business perspective. We are grateful for their contributions.

FFAR Brings Together New Kinds of Partners

Owing to its unique public-private partnership model, FFAR is able to convene diverse groups that might not otherwise collaborate around common challenges of national and international significance. We have formed partnerships with farmer and commodity groups, retail, IT companies, the public health sector, and other foundations.

Since I came on board in 2015, FFAR has joined with 41 funding partners to carry out the Foundation's cutting-edge research agenda, including the Bill & Melinda Gates Foundation, the Laura and John Arnold Foundation, the Fair Food Network, the Indiana Soybean Alliance, the Iowa Corn Promotion Board, Kaiser Permanente Center for Total Health, Cargill and many others. Besides providing good stewardship of taxpayer dollars, FFAR's dollar-to-dollar match ensures our partners are equally invested in delivering value and seeing measurable outcomes, similar to other critical public private partnerships in the food and agriculture space, such as the federal crop insurance program.

By uniting researchers with groups like venture capitalists, partner governments and global philanthropies, FFAR can quickly bring research to scale and more than double the taxpayer's investment.

The Foundation also puts significant emphasis on convening external events and other information sessions with experts to identify critical research needs facing agriculture and food.

To that end, FFAR has reached more than 12,000 individuals in the food and agriculture research community through conference presentations and organized six large-scale convening events that have attracted leaders from science, farming, government, business, and the non-profit sector.

Additionally, FFAR staff have personally met with more than 400 groups in food, agriculture and research to hear their different perspectives on the most pressing issues. We continue to welcome insight from all facets of our vibrant food system: from scientists conducting food and agricultural research, to farmers in the field, to members of the public deciding what to feed their families each day. We seek researchable issues with the potential to yield pivotal pieces of knowledge that propel the food and agriculture field forward. This approach then translates to program implementation. For each project, we survey the food and agriculture field to ensure we are focusing on research questions that are not being answered elsewhere. We then look at the landscape and decide, project-by-project, how to convene the right partners to address a given issue.

To catalyze innovation, we believe we need not only brilliant minds, but also diverse perspectives tackling today's challenges in food and agriculture. It takes outside-the-box, interdisciplinary thinking to solve the food system's most pressing challenges. When soliciting research proposals or building a team, we strive to include experts with diverse backgrounds and in different fields, and perspectives from different sides and stages of an issue.

Many of the events and convenings mentioned above deliver immediate results. For instance, FFAR and Purdue University co-hosted an event to unite the field of plant phenomics by facilitating opportunities for collaborative research. Attendees from 11 countries, 34 companies, 30 academic institutions and a variety of commodity groups, nonprofit organizations and government agencies joined the discussion. Because of this event, FFAR will announce a collaborative project at the end of this month called Crops of the Future. This project will form a collaborative between several companies and organizations to identify genes that give rise to specific traits in plants that will be necessary in the future, including drought resistance, heat tolerance, and increased nutritional value. Companies will pool resources in a pre-competitive space so that results come more quickly and data can be shared.

Just recently, we held a convening event in Lincoln, Nebraska as part of our Overcoming Water Scarcity Challenge Area to determine potential research opportunities to improve irrigation systems.

FFAR is also seeking engagement on virtual platforms. To remain open to emerging innovation potential and facilitate public engagement in research opportunities, FFAR opened the online Concept Portal for public input on research concepts. To submit a research concept to the Foundation, you simply visit our website, foundationfar.org, and give an overview of the idea. Our staff will respond promptly and the idea may help to inform a FFAR research program or project.

FFAR is Delivering on its Promise

Since I joined FFAR as Executive Director in 2015, we have focused on building the foundation into an institution that will support U.S. food and agriculture long into the future. Over the past year-and-a-half, we have established critical resources and processes to support the Foundation's ability to solicit and review grant applications, build partnerships and issue research funding. Now, in 2017, we are seeing the fruits of this monumental effort.

I want to thank the members of this Committee for demonstrating patience as the Foundation was established. I believe, and I know you all agree, that FFAR was created to be an institution, rather than a short-term experiment, to contribute to the long-term competitiveness of our nation. With your support, we have built an efficient, nimble organization able to meet the most pressing challenges in food and agriculture.

To date, FFAR has delivered \$32.4 million in 22 grants with more than 41 funding partners. By the end of the year, we will have obligated about half of our funding and identified more than \$100 million in matching funds.

In addition to building awareness, educating the food and agriculture community on FFAR, establishing long-term partnerships and building the Foundation's systems and structures, we have focused primarily on garnering matching funds. Generating matching funds for any startup organization is a challenge.

What we have discovered over the past two years is that we have two distinct advantages over other government-established research foundations. First is our public funding, which gives FFAR the flexibility to seek out diverse partnerships, especially with the private sector. Rather than raising money for a government agency, which is the model for most government established research foundations, FFAR leverages public funding—more than doubling that funding—for the public good and, in the process, develops a new community of partners. Second is our independence, which allows us to focus almost exclusively on results. When partners are focused just on the science and equally invested in seeing measurable outcomes as soon as possible, new partnerships may develop.

I firmly believe the current FFAR model is working effectively. As a long-term safeguard, we continue to look at ways to take investment income earned by the Foundation and create a long-term fund that will support FFAR. Building a self-sustaining organization is part of the Foundation's five-year strategic plan, but that effort will take time. We will continue to lay the groundwork for future fundraising and partnerships, prioritizing projects that help to attract private sector investment.

Our goal today is to continue to demonstrate our value to this Committee and to the food and agriculture community as a highly effective organization that supports innovative work and collective research priorities.

FFAR Research Success Stories

FFAR now has the systems in place to design programs, assess requests, match funds, and award grants quickly and efficiently. For example, no grant cycle is longer than six months. Because of the expert staff and vetting in place, the Foundation can award grants in as little as one week, acting nimbly to mobilize resources to confront emerging pest, disease and climatic threats before it's too late. Grants can be awarded competitively, directly, or through challenges or prizes.

Taken together, the Foundation has a variety of tools in its toolbox. Of the \$100 million in matching funds identified by FFAR to date, roughly 80 percent will come from non-academic entities, including industry, associations, retail, and foundations. These unique partnerships have allowed FFAR to achieve important results in a short period.

For example, this past March, FFAR announced a National Cover Crop Initiative in partnership with the Samuel Roberts Noble Foundation. The \$6.6 million research initiative was made possible by a \$2.2 million grant from FFAR—a two-to-one match—to promote soil health through the development and adoption of new cover crops across the United States. The National Cover Crop Initiative unites the resources of the two foundations with scientific expertise from several universities and USDA.

Two months later, FFAR responded to an emerging issue in egg production, announcing it had matched a grant to reduce bone fractures in cage-free, egg-laying hens. The research has the potential to improve the health and productivity of approximately 100 million hens by 2025 and garnered support from the United Egg Producers and the American Veterinary Medical Association (AVMA).

The work we are doing to reduce bone fractures in cage-free hens is just one program within our Protein Challenge, a suite of research programs that will support producers' efforts to improve plant and animal production efficiency to meet the growing global protein demand while conserving natural resources. In total, FFAR has seven Challenge Areas ranging from protein to urban food systems. The seven Challenge Areas were developed with direct input from farmers, consumers, industry, and other stakeholders.

Another innovative FFAR program is our Rapid Outcomes from Agricultural Research, or ROAR program. Through ROAR, FFAR makes available up to \$150,000 in matching funds in one-year grants to combat or prevent new or emerging pest and pathogen outbreaks that threaten U.S. food and agriculture systems. ROAR enhances the nation's capacity to mitigate and prevent outbreaks by ensuring rapid review of grant applications and rapidly disbursing funding for research and extension. In this way, ROAR serves as a bridge to traditional, longer-term funding sources while supporting critical short-term research that will help farmers in the field.

For example, when an invasive pest decimated 21 percent of Michigan's 2016 cherry crop, FFAR formed a partnership with the Cherry Marketing Institute to fund scientists at Michigan State University to combat the pest, spotted wing drosophila (SWD). This ROAR grant will benefit the fruit industry in California, Idaho, Michigan, Montana, New York, Oregon, Pennsylvania, and Washington.

Just a few days ago, FFAR announced a new, incredibly innovative program with the University of Illinois that brings together computer scientists, plant scientists, mathematicians and breeders to develop realistic models that mimic plant response to their environment. The Crops *in silico* project, while very theoretical, has the potential to create virtual plant models that could speed up the time it takes to develop new plant varieties by replacing what are often times long term field trials.

As additional projects, events and grants are announced in the months ahead, we look forward to continuing our work with the Committee to streamline FFAR's operations and administration, and we look forward to your suggestions.

How FFAR Designs Programs

There are seven Challenge Areas that guide FFAR's work. Developed in consultation with farmers, consumers, industry, and other stakeholders, the Challenge Areas are:

1. **Protein Challenge** helps to sustainably increase the production of high quality protein to meet current and future demands.
2. **Overcoming Water Scarcity** aims to increase the efficiency of water use in agriculture, reduce agricultural water pollution, and develop water reuse technologies.
3. **Forging the Innovation Pathway to Sustainability** helps break down barriers to the adoption of technology and research results into sustainable practices.
4. **Healthy Soils, Thriving Farms** aims to increase soil health by building knowledge, fueling innovation, and enabling adoption of existing or new innovative practices that improve soil health.
5. **Food Waste and Loss** seeks to mitigate social, economic, and environmental impacts from food waste and food loss.
6. **Urban Food Systems** enhance our ability to feed urban populations through urban and peri-urban agriculture, augmenting the capabilities of our current food system.
7. **Making "My Plate," Your Plate** focuses on research that includes, but is not limited to, increasing the production and accessibility of fruits and vegetables with optimal nutritional quality and taste desirability, and reviewing system constraints that not only impede the incorporation of more fruits and vegetables into the supply chain, but also decrease farmer profitability and consumer affordability.

In addition to these seven Challenge Areas, FFAR addresses pressing issues in food and agriculture that cut across multiple areas, such as pollinator health and emerging pest and disease threats.

FFAR is Building the Bench

By championing the next generation of food and agriculture scientists, the Foundation is also taking an important step in making agriculture an attractive field for aspiring scientists through the New Innovator in Food and Agriculture Research Award. As a scientist, I am particularly proud of the New Innovator program.

It was an honor last year for FFAR to award its first grants to nine talented early career researchers, or New Innovators, in partnership with their respective universities. FFAR invests in faculty members within the first three years of their careers to allow our best and brightest to pursue innovative and transformational ideas uninhibited by the pressure of identifying their next grant. Our goal is to train, encourage, and inspire future generations of agricultural and food scientists. FFAR announced nine New Innovator awards in 2016, including Dr. Kisekka of Kansas State University. Dr. Kisekka's research will integrate data to develop methods and tools for optimizing water use in agriculture. Another researcher from Purdue University seeks to improve plant disease mitigation by investigating which genes are communicating through plant root systems. The 2017 awardees will be announced this summer, and we look forward to sharing their names with this Committee.

In that same vein, FFAR has partnered with the National Academies of Sciences, Engineering, and Medicine and the Supporters of Agricultural Research (SoAR) Foundation to launch Breakthroughs 2030, an innovative effort to determine the greatest scientific opportunities in the next decade within the fields of food and agriculture. Breakthroughs 2030 will respond to the numerous reports issued by government and non-governmental organizations on the relationship of the food and agricultural system to public health, food security, national security, trade, economic development, and the environment. Most of these reports emphasize the need to dramatically increase food production worldwide to feed a growing global population. Tapping the ingenuity and knowledge of the American research community, Breakthroughs 2030 will produce a blueprint for how research can solve these major issues. FFAR is proud to support this effort on behalf of U.S. food and agriculture.

Evolving Our Institutions to Meet New Challenges

A few years ago, a seismic shift occurred in global leadership when China overtook the United States in public agricultural R&D. By 2013, according to the USDA, they had a 2-to-1 advantage over the United States. But the members of this Committee did not take that news lightly. Instead, you took a bold step by establishing FFAR with bipartisan support.

In my lifetime, total agricultural output in the United States has grown nearly 170 percent with less land and labor due to the adoption of technologies in crop and livestock breeding, farm

equipment, fertilizer use, pest management, and farming practices. Advances in food, agricultural, and environmental sciences depend upon this research. And to put a finer point on these achievements—over that same period, the United States has established itself as the most consistently food secure nation on the planet. With food security come economic and national security. And when you have all three of these together, you have prosperity.

Let us not overlook just how important agricultural research is to our nation's prosperity. Like medical sciences, modern advances in agriculture depend upon research advances from public and non-governmental organizations alike.

Certainly, the return on investment must be recognized. Ours is a technology and knowledge-based economy, and we firmly believe that food and agriculture science conducted by our organization and by our colleagues in the research funding community, is a critical economic engine. Agricultural science and research from public and private institutions is a boon to our nation's economy, generating roughly \$20 in economic activity for each \$1 invested.

Yet, as we all know, federal funding for agricultural research has been stagnant over the past decade, and has declined in real terms according to USDA.

With 9.7 billion people projected to populate the world by 2050, we have new challenges to face with far-reaching implications. Global hunger is still unacceptably high. Pests and disease have decimated American crops like citrus while stagnant yields for staples like wheat make it tougher to compete in trade.

If America wants to continue to feed the world, our farmers and ranchers must be given every opportunity to apply cutting-edge research and technology into their fields. With an ever-increasing number of mouths to feed and threats mounting, it's imperative that our food system keep pace by supporting innovation and technology.

I also believe there is no better time to be engaged in food and agricultural science and research. The pace of technology is absolutely breathtaking, and FFAR is uniquely positioned to bring together all aspects of our food system in an inspiring, unified manner to solve the biggest challenges ahead.

FFAR Opportunities Ahead

In the 2014 Farm Bill, this Committee took a bold step by establishing the Foundation for Food and Agriculture Research with bipartisan support. Designed with a public-private partnership model, FFAR's emergence as a cutting-edge research institution is well timed considering the many challenges we face.

FFAR matches every one of its public dollars with outside funding, delivering huge value for American taxpayers. By 2019, the U.S. government's \$200 million investment in FFAR will deliver more than \$400 million in programming.

Building a foundation from scratch is not easy, but since 2014, FFAR has worked to hire staff, develop reliable systems and structures including robust scientific review processes, and raise funding from diverse partners. Today, the Foundation has invested more than \$32 million in food and agricultural science with 41 partners, and has done so nimbly and efficiently, with the ability to award grants in as little as one week to confront emerging pests, diseases and climatic threats before it's too late. Moreover, by uniting researchers with groups like venture capitalists, the private sector and global philanthropies, FFAR can quickly bring research to scale and more than double the taxpayer's investment while, at the same time, expanding the tent for U.S. agriculture.

Now that the Foundation is fully staffed and has developed the systems and structures to contribute toward its long-term sustainability, the value and volume of award announcements will continue to pick up throughout 2017 and 2018. In the following months, FFAR will further distinguish itself as a cutting-edge institution with the announcement of three significant research projects.

1. **A new soil health initiative** will help catalyze the adoption of soil health promoting practices across a large percentage of our farmland.
2. **Research to improve photosynthetic efficiency** has the potential to significantly increase the yield of staple food crops.
3. **Advancing and applying new irrigation technologies** will make irrigation more efficient for producers.

Over the next five years, FFAR will become a pivotal player in the food and agriculture research community. In order to fulfill our Congressional mandate, FFAR is uniquely positioned to carry out its three core strategic priorities:

1. Evaluate potential gaps and emerging issues in food and agriculture.
2. Facilitate public private partnerships to fund research that addresses the most pressing issues in food and agriculture.
3. Grow the scientific talent pool to address critical food and agriculture issues.

In keeping with the Foundation's strategic plan, we anticipate awarding the balance of FFAR's funding by early 2019, matched dollar for dollar by diverse partners in support of scientific solutions to critical issues facing food and agriculture.

We are grateful for the opportunity to continue work with Congress to ensure FFAR is reauthorized and fully funded in the next Farm Bill, consistent with our bipartisan legacy as an institution contributing to the long-term competitiveness of our nation's food and agriculture sector.

I know we will look back on the past two years as an important, formative time spent planting the seeds of innovation and I also know that the best is yet to come for FFAR. The relationships,

scientific ideas, and organizational framework in which we have invested so much energy are just now beginning to prosper.