ESCOP Science & Technology: http://escop.info/committee/scitech/

4/27/2020
4 pm ET, via Zoom (https://zoom.us/j/7318779678 or 1 669 900 9128 Meeting ID: 731 877 9678)

Committee Members:

Chair: *Jody Jellison (NERA)* **Past Chair:** Laura Lavine (WAAESD) **Delegates:** Alton Thompson (ARD) John Yang (ARD) Joe Colletti (NCRA) *Bill Barker (NCRA)* *Indrajeet Chaubey (NERA)* *Mark Hutton (NERA)* *Susan Duncan (SAAESD)* *Nathan McKinney (SAAESD)* Gene Kelly (WAAESD) *Chris Davies (WAAESD)* **Executive Vice Chair:** *Bret Hess (WAAESD ED)* *Saige Zespy (WAAESD Recorder*)	**Liaisons:** *Robert Matteri (ARS)* *Wendy Powers-Schilling (ECOP)* Tim Conner (NIFA) *Danesha Carley (NIPMCC)* *Tim Killian (SSCC)* **Guest:** *Paul Wester, National Agricultural Library* *Cynthia Parr, National Agricultural Library*

Minutes:

1. Welcome – Jellison
    a. Jody thanked everyone for attending and noted that documents from Bret Hess' April 22 email at 3:20 p.m. will be referenced during the meeting.
2. Roll-call – Hess
    a. The names of committee members who were present are italicized in the list above.
    b. Six of the 10 committee members were present, providing a quorum. Three liaisons and two guests were also present.
3. Approval of meeting notes from 03/23/2020 – Jellison
    a. Bill Barker moved to approve the minutes as submitted.
        1. Nathan McKinney seconded the motion.
        2. The motion passed unanimously.
4. Special Guests (page 2)
    a. Paul Wester, Director, National Agricultural Library (NAL)
        1. Paul noted that the National Agricultural Library has been working to carry out the directives of the Holdren Memo (which was released in February 2013 from the Office of Science and Technology Findings) since November 2014. The memo noted that scientific or technical

research funded by agencies and departments of the government must make findings and underlying data public.
    1. This includes extra-mural and intra-mural funds.
    2. In January 2019, Congress enacted the Foundations for Evidence-Based Policy Making and a piece of legislation called the Open Data Act for Open, Public, Electronic and Necessary, which codifies the direction from the Holdren memo.
2. NAL is involved in developing departmental regulations for implementing these statutes and policies, while also developing policies and procedures internal to ARS to govern intramural research.
3. NAL has worked to develop data management guidance for research to follow.
4. Currently, the PubAg portal at the National Agricultural Library makes over 220,000 full-text articles available.
5. Data management plans will be required for research data and public access, with several requirements.
    1. Data should be created in a machine-readable format to support scientific integrity and data-reuse for large projects across disciplines.
    2. Data must be deposited in a repository with a digital object identifier.
    3. Data must be publicly available within 30 months of completing the collection.
6. Two documents and a 10-minute video are available the describes the requirements of a data management plan that links to guidance from NAL.
    1. Data management plans must comply with the public access policy over the data lifecycle.

b. Dr. Cynthia (Cyndy) Parr, NAL Senior Policy Analyst for Data Management
    1. The Ag Data Commons was developed as an infrastructure to digitalize agriculture data. The Ag Data Commons focused on the transformation of data.
    2. The Ag Data Commons provides a pipeline so data generated by USDA is shared with data.gov.
        1. Expert metadata curators work to curate the content and make sure descriptors are consistent and comprehensive.
        2. They also harvest metadata from other repositories.
    3. The Ag Data Commons is being moved to the cloud currently.
    4. Through the Ag Data Commons, data are more widely accessible on data.gov, science.gov, Google Data Search and other platforms.
    5. Collaboration opportunities are available, particularly through trainings, workshops and working with land-grant libraries to compile data.

1. Ag Data Commons would like to see coordination with individual experiment stations and libraries to standardize and integrate data.
2. Ag Data Commons also provides guidance and standards for ag data collection.
3. DIDag is a workshop series (Driving Innovation through Data in Agriculture) that brings researchers, librarians and data managers together to start conversations on best practices.
    1. The second iteration of the workshop covered additional group and included topics like ag data privacy and challenges associated with data collection.

c. Questions
    1. Nathan McKinney requested some "success" stories to show the impact. Then, he would be more able to get investigators excited about providing data and cooperating with NAL.
        1. Cyndy said a group at University of Maryland is working to collect success stories in a dashboard format to overview success and potential impacts.
            1. For example, a data availability statement noted that articles with data connected to a repository were cited 25% more frequently than articles that did not have data attached.
    2. Chris Davies asked about big data, such as genomic data that is very large and potentially difficult to derive meaning from.
        1. Cyndy noted they are working to collaborate, rather than take over resources. NAL/Ag Data Commons doesn't intend to become a gene bank. Rather, they are working with NCBI's short-read archives, NIH resources, etc. to connect data rather than duplicate data.
        2. They are also working with a collection of agriculture databases called Ag Bio Data to gather data. NAL is hoping to get funding from NIFA to streamline the connection between the individual databases and the Ag Data Commons.
    3. Susan Duncan asked about data integrity, ensuring that data is not altered or edited.
        1. Cyndy noted that many of the data sets are peer reviewed because the articles that are associated are also peer reviewed, giving more credibility to the data.
        2. Publishing the data also provides the opportunity to have a "hard" original copy of data to reference. Once uploaded, data cannot be changed, so if data is altered, it should be easily be able to be verified.

5. Dealing with the COVID-19 pandemic – Jellison
    a. APLU request to “identify any messaging on current research projects that are addressing infectious diseases, viruses, AMR, zoological diseases or any related topics that address the nexus of people, food and the environment.”

1. System-wide survey (see attached ESCOP STC_COVID-19 Questionnaire_04202020)
    1. Jody reported that a survey was distributed to gain an understanding of what is happening at different land-grant institutions across the U.S. in response to COVID-19 and what resources are available.
    2. The survey also provided information to APLU for their initiatives.
2. Initial approach (see attached ESCOP STC_Animal Health Projects_04212020)
    1. Bret began to compile a list of animal health projects that are related to COVID-19 after being asked to identify projects related to infectious disease, viruses, AMR and zoological diseases across the system.
    2. He started with animal health to quickly get an idea of what was going on.
3. Next steps
    1. Bret plans to continue by looking at plants, then move into the nexus of people, food and the environment. The final topic is very extensive, which will take significant time to complete.
    2. A bigger question arose during this request. Bret noted the Science and Technology Committee is not poised well to respond rapidly. Bret provided the responses while working with Jody.
        1. Jody noted that it might behoove the committee to empower Bret to provide time-sensitive, factual information requested from APLU without significant committee input.
        2. Chris Davies said it makes sense for Bret to respond to APLU requests, particularly if he could give the committee one to two days (a very short time) to look over comments prior to sending them out.
        3. Jody also added that Bret would not be handling prioritizations, recommendations, guidelines, or any information of that sense.
        4. Mark Hutton and Nathan McKinney agreed with the proposition.
        5. Susan Duncan further suggested that Jody provide guidance as to what can and cannot be answered independently by Bret without committee input.

6. Liaison Updates, as needed
    a. ARS
        1. Bob Matteri noted ARS has been working in maximum telework status, with only essential personnel visiting ARS facilities, in order to protect people and property.

1. If research would be endangered by postponement, projects were allowed to continue with appropriate protective measures in place, including:
    1. Social distancing
    2. Staggered shifts
    3. Use of PPP
2. Non-essential travel is not allowed. In limited cases, particularly in the West, ARS employees may travel by vehicle to begin planting, preparing nurseries, etc.

2. Scientists are anxious to get back to work, but gradual steps will be taken, with state and national-level guidance both taken into account.
    1. The gradual transition back to work with be adapted to geographic differences.
    2. Several task forces are in place to determine how to return to work safely and in compliance with local and state health ordinances.

b. ECOP
    1. Wendy Powers provided several updates for ECOP.
    2. An Executive Director was hired and will start on June 1. Caroline Crocoll (currently at NIFA) accepted the position, relieving Rick Klemme of his interim role.
    3. ECOP put in an $80 million in the phase 4 budget request for Extension work in response to COVID-19. The funds would be used to analyze how Extension engaged with stakeholders and clientele in a more virtual well with a new normal from COVID-19.
    4. Extension offices are funded differently in each state, but offices broadly supported by county funding are at risk for impacts to their budgets. ECOP is cognizant of the fact that county revenue may be much lower this year, which will impact Extension programming.
    5. Jody added that state funding is also a concern for programs that are primarily funded by the state.

c. NIFA
    1. Tim Conner was unable to attend the meeting.
    2. Bret publicly thanked Tim for his work and responsiveness to questions from the committee. Some of the questions during the NIFA question and answer session with Dr. Angle arose directly from conversations between Bret, Jody and Tim. Bret noted it is helpful to have Tim and Bill Hoffman working on behalf of the Science and Technology Committee.

d. NIPMCC
    1. Danesha said there are no updates for NIPMCC at this point.
    2. The committee is working on three leave-behind documents on big banner topics. Anyone who is interested in providing input is welcome to let Danesha know to join the effort.

1. Topics include emerging and invasive pests; pesticide resistance management; and communication and stakeholder engagement.
2. Documents will be a maximum of three pages. They will be distributed hopefully in October at the committee's meeting.

3. Currently NIPMCC is still hoping to meet in person in October, but that remains to be seen.

e. SSSC
   1. Tim noted there have not been any meetings in the last month.
   2. SSSC is planning to hold their upcoming meeting, though it will likely be virtual.
      1. They are not sure whether or not a meeting in Washington, DC or Kansas City will occur this year.
      2. The committee is discussing the best way to get its work done.

5. Revised one-page, double-side "leave behind" – Jellison
   a. A final document has been pulled together by communicators and committee members.
   b. Bill Barker moved to formally approve the document.
      1. Nathan McKinney seconded the motion.
      2. The motion passed unopposed.
   c. Jody noted that minor edits (such as typos, etc.) should be submitted to Bret.
   d. Bret added the communicators did an excellent job, and they revised the document multiple times to achieve the final product.
6. Report discussions – Jellison
   a. USDA Agriculture Innovation Agenda (see attached agriculture-innovation-agenda-vision-statement)
      1. This will be discussed at the next meeting. Please read the report document to ensure robust conversation during the meeting.
      2. The document refers to re-thinking the process of how RFPs go out, what should be in them, etc. The committee may be able to provide input and influence the process moving forward.
7. Other business, as needed
   a. Next Zoom meeting, June 1 4-5 pm ET
      1. Review and vote on Excellence in Multistate Research Awards
         1. Jody reminded committee members this process is core to the function of the committee and a quorum is important.
         2. Bret will provide a form for committee members to also provide written comments.

   a. Potential Guest (Invited and available on June 1 date)
   John Dyer, USDA ARS, USDA Agriculture Innovation Agenda

Action Items:
- Read "USDA Agriculture Innovation Agenda" prior to meeting. (All)

- Email committee members evaluation forms for discussion of Excellence in Multistate Research nominations during the June 1 meeting. (Bret H.)

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   a. ARS
   b. ECOP
   c. NIFA
   d. NIPMCC
   e. SSSC
5. Revised one-page, double-side "leave behind" – Jellison
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    John Dyer, USDA ARS, USDA Agriculture Innovation Agendang?

AGRICULTURAL EXPERIMENT STATIONS

A System to Address Challenges in Food and Agriculture

Our food and agricultural systems face complex challenges as the physical environment and human societies change. Public investment in research and development is key to increasing agricultural productivity, food safety and security, community resilience, environmental stewardship, and economic growth. As part of the Land-grant University system, and with the support of USDA capacity funding, Agricultural Experiment Stations (AES) and agricultural research programs at historically black and tribal colleges and universities are uniquely positioned to improve food and agricultural systems.

WHAT MAKES AES UNIQUE?

- Institutions in all 50 states and many U.S. territories with research sites representing diverse ecosystems, communities, and food production systems
- A family of land-grant universities directs research that reflects a diverse U.S. population and varied needs
- Laboratories, greenhouses, computational centers, and tools focused on improving the food supply and protecting the environment
- Skilled scientists, educators, students, and staff working in a wide variety of fundamental and applied research fields
- Impartial, verified science, technology, and recommendations
- Strong relationships with government agencies, farm and commodity groups, and the private sector

THE POWER OF PARTNERSHIPS

- Federal and state funding allows AES to mobilize scientists to respond quickly to local issues
- Multistate projects bring together scientists from AES across the country to tackle regional and national issues, creating state synergy, reducing duplication, and leveraging funds
- A close relationship with Extension and educators creates a feedback loop from research to application

Experiment Station Committee on Organization and Policy (ESCOP)

http://escop.info

HOW ARE AES IMPACTING THE GRAND CHALLENGES?

Improving sustainability, competitiveness, and profitability

Onion growers applied ***75%*** less insecticide and saved ***$300 per acre*** using pest management programs developed by researchers.

Researchers ***quadrupled*** the length of the strawberry growing season, increasing production ***80%***.

Research-based recommendations saved ***10,500*** honey bee colonies, enough to provide crop pollination worth ***$6 million each year***.

Cutting-edge research has minimized the impacts of cattle diseases, which cause ***billions of dollars*** in losses.

In just one generation, soybean yields have ***doubled*** and corn yields have ***quadrupled.***

Adapting to and mitigating climate change impacts

Researchers have developed crop varieties that grow well on marginal land and bred animals that can tolerate heat.

Researchers found that changes in temperature and precipitation caused soybean yields to be ***30%*** lower over the last 20 years, resulting in losses of ***$11 billion.***

Supporting energy security and the bioeconomy

Growers using recommended lighting and heating sensors and strategies have reduced energy use ***up to 30%***.

Researchers increased the oil content of sugarcane tissues ***80-fold*** and genetically modified cell walls, improving ethanol production efficiency by ***more than 60%***.

Scientists developed bio-based textiles that add value to agricultural byproducts, reduce waste, and provide alternatives to synthetic, petroleum-based textiles.

Ensuring a safe, secure, and abundant food supply

Researchers designed antimicrobial sprays, high pressure processing, and other technology that ensures food safety without damaging quality.

24 peanut varieties worth ***$200 million per year*** were bred from a single peanut sample collected by researchers in 1952.

Improving human health, nutrition, and wellness

Pioneering research on bioactive compounds is guiding diet-based interventions, new food products, and accurate food labels, helping people make healthy choices, stave off illness, and reduce healthcare costs.

85 colleges are using a research-based program to create healthier campuses and encourage healthy diet, exercise, and stress management choices among their students.

Heightening environmental stewardship

Information about the economic value of ecosystem services has helped land managers and policymakers weigh the costs and benefits of management options, estimate losses under certain land use and climate scenarios, and predict how mitigation strategies might reduce losses.

Researchers helped install prairie strips on ***35 farms*** in ***9 states***, reducing soil, nitrogen, and phosphorus runoff from these farms by ***up to 95%***.

80% of commercial egg producers have adopted new feeding strategies that reduce ammonia emissions.

Building personal, family, and community resilience

Research on rural areas is guiding programs and policies, increasing the likelihood they successfully meet needs.

Nationwide, residents, businesses, and government agencies use research to guide disaster preparedness and recovery and to adapt to climate change impacts.

Research has shown that diversity and tolerance can lead to richer stores of social capital and economic prosperity.

WHAT DO AES NEED NOW?

With enhanced support, AES and agricultural research programs at historically black and tribal colleges and universities can continue to address challenges in food and agriculture more efficiently than any other system in the world. Filling current gaps and needs will require:

Sustained capacity funding to support diverse research, enable exploratory and early-career projects, and give AES the flexibility to respond to emerging local issues

Resources to improve campus infrastructure and facilities for cutting-edge research

Interdisciplinary, systems-level research

Broader focus on sustainability and wellness

Models and decision-making tools that account for interlinked variables and uncertainty

Harnessing advances in big data, genetics, nanotechnology, and other emerging fields

Strategies for communicating information and sharing technology

Dear Regional EDs,

I am seeking your assistance with gathering input in response to a request by the Association of Public and Land-grant Universities related to the possibility of including supplemental funding for NIFA in the next federal stimulus package. An **estimate** of how NIFA-supported research has been affected by the COVID-19 pandemic would be useful for "Supporting Job-saving Supplemental Funding for Research Capacity."

Time is of the essence! A system-wide best **ESTIMATE** is all that is needed at the moment. Please ask directors in your region to respond to the following questions as soon as possible. Regional responses need to be submitted to me by the close of business on **Monday, April 20**. Thanks to you and directors in your region for your considerate attention to this very important matter.

For all of the following questions, please take into account both capacity and competitive NIFA support.

1. What percentage of your unit's overall NIFA-supported research portfolio/activities has/have needed to ramp-down or close as a result of the COVID-19 pandemic? Responses to this question should include both field and laboratory research.
_____ 0-20% _____ 21-40% _____ 41-60% _____ 61-80% _____above 80%

2. What percentage of your monthly NIFA-supported budget is spent on salaries of personnel who are considered essential or conducting critical research?
_____ 0-20% _____ 21-40% _____ 41-60% _____ 61-80% _____above 80%

3. How many research projects have been initiated specific to COVID-19 that were enabled by NIFA support?
_____ 1-4 _____ 5-10 _____ more than 10
Give examples of projects initiated:

4. How has your unit provided support during the COVID-19 pandemic? Give examples such as donation of gloves, masks, PPE, reagents, equipment, food, etc. Actual quantities would be a valuable piece of information.

5. From the perspective of lost-time on research, how many months of additional NIFA support do you anticipate needing to meet the objectives of your station's capacity and competitive projects? _____ 1 month _____ 2 months _____ 4 months _____ 6 months _____ If none of these, please provide another estimate in months

Funding Source	**Infectious Diseases**	**Viruses**
Multistate	**NC1180: Control of Endemic, Emerging and Re-emerging Poultry Respiratory Diseases in the United States**	
	W4177: Enhancing the Competitiveness and Value of U.S. Beef	
	NE1701: Mycobacterial Diseases of Animals	
Hatch	**THE INSTITUTE FOR INFECTIOUS ANIMAL DISEASES (IIAD)**	**DIVA VACCINE DEVELOPMENT AGAINST PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS**
	COMPREHENSIVE, TARGETED NEXT-GENERATION SEQUENCING PANELS FOR DETECTION AND CHARACTERIZATION OF PATHOGENS FOR SYNDROMIC TESTING AND SURVEILLANCE	**MOLECULAR AND BIOLOGICAL CHARACTERIZATION OF INFECTIOUS BURSAL DISEASE VIRUSES**
	EQUINE LYMPHOCYTE DYNAMICS IN HEALTH AND DISEASE	**INVESTIGATING THE ECOLOGY, EVOLUTION AND PREVENTION OF ARBOVIRUSES IN THE AMERICAS**

ADDRESS ANIMAL HEALTH AND DISEASE RELATED ISSUES USING BIOLOGICAL ENGINEERING AND SYNTHETIC BIOLOGY APPROACHES

METHODS FOR CONTROL OF ECONOMICALLY IMPORTANT VIRAL DISEASES OF POULTRY

NONCODING RNA-PROTEIN COMPLEXES AS TARGETS FOR DEVELOPING NOVEL THERAPEUTIC AGENTS AGAINST DOMESTICATED ANIMAL AND HUMAN PATHOGENS

UNDERSTANDING THE EFFECTS OF INTERFERON AND SUPERINFECTION EXCLUSION ON THE NEURONAL ANIMAL ALPHAHERPESVIRUS INFECTIOUS SPREAD

PLUG-AND-PLAY MULTI-PATHOGEN VACCINE PLATFORM FOR ANIMAL DISEASE COMPLEXES

INVESTIGATING THE ROLE OF LINEAR UBIQUITIN SIGNALING IN PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS-INDUCED INFLAMMATION AND CELL DEATH

PATHOGEN EVOLUTION, TRANSMISSION, AND DETERMINANTS OF HEALTH IN WILD AND DOMESTIC ANIMAL POPULATIONS

NEUROINFLAMMATION IN THE FETAL PIGLET BRAIN DURING MATERNAL IMMUNE ACTIVATION

MECHANISMS OF MYCOBACTERIUM TUBERCULOSIS COMPLEX SPECIES PERSISTENCE

STRUCTURE-FUNCTION STUDIES ON VIRAL-HOST INTERACTIONS KEY TO ANIMAL IMMUNITY

DISEASES OF ANIMALS AS IMPORTANT INHIBITORS OF FOOD SECURITY

IMPROVED DIAGNOSTIC AND CONTROL STRATEGIES FOR VIRAL DISEASES OF SWINE

DEFINING METABOLIC PATHWAYS IN PATHOGENIC MYCOBACTERIA: IN SEARCH OF TARGETS FOR ATTENUATION AND NOVEL ANTIMICROBIALS

NATURAL KILLER CELL RESPONSE AFTER INDUCTION OF CALORIC RESTRICTION IN ADULT OR AGED MICE

	DIAGNOSIS AND EPIZOOTIOLOGY OF EMERGING DISEASES OF WILDLIFE, LIVESTOCK, AND POULTRY	
	UNDERSTANDING STAPHYLOCOCCUS AUREUS COLONIZATION AND INFECTION IN HORSES AND CATTLE	
	ANALYSIS OF GAMMA/DELTA T CELLS AND INNATE IMMUNITY	
	NEW, EMERGING, AND RE-EMERGING ANIMAL DISEASES: WYOMING AND THE INTERMOUNTAIN REGION	
	UNCOVERING THE ROLE OF FUSOBACTERIUM NUCLEATUM MEMBRANE BOUND AND SECRETED PROTEINS IN INFECTION AND COLORECTAL CANCER	
	SPATIO-TEMPORAL MODELING OF INFECTIOUS DISEASES	
AHDR	**DEVELOPMENT AND VALIDATION OF ISOTHERMAL RECOMBINASE POLYMERASE AMPLIFICATION TECHNOLOGY AND LATERAL FLOW AS A RAPID DIAGNOSTIC TOOL FOR THE FIELD DETECTION OF TOP PRIORITY AQUATIC ANIMAL DISEASE PATHOGENS IN 30 MINUTES AT AQUACULTURE FARMS**	**AN INNOVATIVE VACCINE PLATFORM FOR PRRSV BASED ON FERRITIN NANOCAGES**

RESEARCH ON INFECTIOUS DISEASES OF ANIMALS AND THEIR MANAGEMENT IN MONTANA

CHARACTERIZATION OF AVIAN HERPESVIRUS VECTOR VACCINES CAPABLE OF PROTECTING AGAINST MULTIPLE DISEASES IN CHICKENS

VACCINE APPROACHES FOR ENDEMIC AND EMERGING DISEASES

HOST-PATHOGEN-ENVIRONMENT INTERACTIONS: IMPACT ON ANIMAL HEALTH AND DISEASE IN VIRGINIA

NOVEL BIOMARKERS FOR JOHNES'S DISEASE

UTILIZING INDIANA LIVESTOCK PREMISES DATABASE TO PREDICT ANIMAL DISEASE INTRODUCTIONS AND SUBSEQUENT OUTBREAKS

INTEGRATED APPROACHES TO APPLIED EQUINE RESEARCH

USE OF INNANTE IMMUNE SYSTEM ADJUVANTS AS COUNTERMEASURES AGAINST SALMONELLOSIS IN CALVES

COMPREHENSIVE CHARACTERIZATION OF SMALL REGULATORY RNAS IN BRUCELLA ABORTUS

MYCOPLASMA GALLISEPTICUM POPULATION-LEVEL VARIABLE SURFACE LIPOPROTEIN GENE EXPRESSION MODELING IN RESPONSE TO ECOLOGICAL PRESSURES

Evans-Allen

MOLECULAR SIGNATURES AND REGULATORY CHECKPOINTS FOR ANIMAL HEALTH

Anti Microbial Resistance

NC1202: Enteric Diseases of Food Animals: Enhanced Prevention, Control and Food Safety

NE1748: Mastitis Resistance to Enhance Dairy Food Safety

Zoological Diseases

NCDC234: North American interdisciplinary chronic wasting disease consortium

MAINTAINING THE EFFECTIVENESS OF ANTIMICROBIALS FOR TREATMENT OF BACTERIAL INFECTIONS IN SWINE BY DECREASING THE PREVALENCE AND SPREAD OF ANTIMICROBIAL RESISTANCE GENES

THE ECOLOGY OF EMERGING VECTOR-BORNE DISEASE PATHOGENS

CHARACTERIZING OPPORTUNISTIC BACTERIAL PATHOGENS OF CATTLE: LEVERAGING GENOMICS AND PROTEOMICS FOR ENHANCED DETECTION OF DISEASE CAUSING STRAINS, ANTIMICROBIAL RESISTANCE, AND THE DEVELOPMENT OF MITIGATION STRATEGIES

DIAGNOSIS, EVOLUTION AND PREVENTION OF ZOONOTIC INFLUENZA VIRUSES

SYSTEMS APPROACH FOR ANALYZING INTERACTIONS BETWEEN ANTIBIOTIC RESISTANT CAMPYLOBACTER JEJUNI, THE INTESTINAL MICROBIOME AND HOST IMMUNITY

WILDLIFE DISEASES OF ECONOMIC AND CONSERVATION IMPORTANCE

MICROBIOME AS ANTIMICROBIAL ALTERNATIVES TO REDUCE FOOD BORNE CAMPYLOBACTERIOSIS AND TO IMPROVE POULTRY PRODUCTIVITY

INNOVATIVE CHICKEN ANTIBODY APPLICATIONS IN A ONE HEALTH APPROACH: IMPROVING HUMAN AND ANIMAL HEALTH

CHARACTERIZATION OF CHANGES IN THE INTESTINAL MICROBIOME OF CATTLE FOLLOWING SYSTEMIC ANTIBIOTIC ADMINISTRATION

STUDY OF SWINE AND BOVINE INFLUENZA VIRUSES

NOVEL DISINFECTANT/ANTISEPTIC-SELECTED ANTIMICROBIAL-REDUCED SUSCEPTIBILITY MECHANISM IN STAPHYLOCOCCUS AUREUS

ECOLOGICAL AND SOCIAL DETERMINANTS AND MANAGEMENT OF ARTHROPOD-BORNE DISEASES OF PUBLIC AND VETERINARY HEALTH IN SOUTH CENTRAL UNITED STATES

ADVANCING ONE HEALTH THROUGH ENTOMOLOGY AND WILDLIFE ECOLOGY RESEARCH

INVESTIGATIONS IN ONE HEALTH: SURVEILLANCE, RISK AND MANAGEMENT OF PATHOGEN TRANSMISSION AMONG FREE-RANGING WILDLIFE, DOMESTIC SPECIES AND HUMANS

GENETIC ELEMENTS CAUSING ANTIMICROBIAL RESISTANCE IN SALMONELLA ISOLATED FROM CATTLE AT A VETERINARY MICROBIOLOGY LABORATORY IN NORTHERN CALIFORNIA, 2002- 2017: FOCUS ON DRUGS OF CRITICAL IMPORTANCE TO HUMAN AND VETERINARY MEDICINE"

GENETIC RESISTANCE TO DISEASE IN CHICKENS – NOVEL BIOLOGICAL RESOURCES AND CONTEMPORARY GENETIC APPROACHES

EXPLORING ANTIMICROBIAL ALTERNATIVES FOR CONTROLLING INTESTINAL INFECTIONS IN POULTRY

ZOONOTIC DISEASES IN ANIMAL AGRICULTURE: IMPLICATIONS TO PUBLIC HEALTH AND AGRIRESEARCH TO COMBAT THE PATHOGENS

ENVIRONMENTAL STRESSORS AND THEIR IMPACT ON WILD BIRDS' CAPACITY TO SERVE AS AMPLIFICATION HOSTS FOR ZOONOTIC PATHOGENS

Agriculture Innovation as a Solution for Farmers, Consumers, and the Environment

American agriculture is environmentally sound, economically viable, and consumer focused, and its success is due to the United States' open-arms approach to innovation. The Agriculture Innovation Agenda (AIA) is the United States Department of Agriculture's (USDA) commitment to the continued success of American farmers, ranchers, producers, and foresters in the face of future challenges. It is a department-wide effort to align USDA's resources, programs, and research to provide farmers with the tools they need and to position American Agriculture as a leader in the effort to meet the food, fiber, fuel, feed, and climate demands of the future. We will also continue working to modernize our regulatory framework so America's producers will have the benefit of modern technologies, such as biotechnology, necessary to meet these challenges. USDA will stimulate innovation so that American agriculture can achieve the goal of increasing U.S. agricultural production by 40 percent while cutting the environmental footprint of U.S. agriculture in half by 2050.

To help achieve this goal, USDA commits to:

I. **Create a comprehensive U.S. agriculture innovation strategy to align public and private research efforts:** Bold and transformative innovation is needed to meet future demands. We will seek input from the agricultural community on what innovative technologies and practices are needed to meet these demands. We will use that input to seek alignment between the research goals of the scientific and innovation communities with the demand for tangible and relevant outcomes.

- **Over the next year, USDA will:**
  - Utilize innovation breakthrough opportunities derived from the 2019 National Academies of Science report, Science Breakthroughs to Advance Food and Agricultural Research by 2030, to form the basis for a forthcoming USDA Request for Information (RFI) on the most important innovation opportunities to be addressed in the near and long

term. The focus will be on transformational innovation opportunities defining the next era of agriculture productivity and environmental conservation. We encourage stakeholders to provide input on how these exciting science and technology developments hold potential for agriculture in the future. USDA will offer technical assistance for workshops to gather this feedback.

- Using input provided, identify common themes across the agriculture customer base to inform research and innovation efforts in the Department, the broader public-sector, and the private sector.

II. Integrate the latest innovative conservation technologies and practices into USDA programs:

There have been dramatic advances in efficiency and conservation performance over the past two decades. USDA can assist farmers in accessing and adopting new technologies and practices to help producers meet productivity and environmental goals. To accomplish this, the Department will focus on USDA program delivery to encourage rapid adoption of cutting-edge technologies and practices. USDA will also champion commercialization of innovative technologies in the private sector

- **Over the next year, USDA will:**
  - Improve internal coordination in order to facilitate transmission of best approaches among USDA research and program agencies and identify, customize, and fast-track the best emerging innovative technologies to integrate and deliver to our customers through USDA programs.
  - Develop standardized OneUSDA processes, including a “fast pass” process for immediate in-take and integration of proven technologies.
  - Work with existing regional outreach networks and other partnerships to identify innovation opportunities in order to rapidly integrate the latest technologies into our programs and understand how those technologies can best serve our customers.
  - Solicit and encourage development of the best “ready-to-go” innovative technology from the private sector.

III. **Improve USDA Data Collection and Reporting:** USDA currently collects a wealth of data on commodity production, but information on how our food is produced and the conservation practices being employed is harder to come by. USDA intends to increase our understanding of the adoption of conservation practices and improve the timeliness and access to conservation information, delivering a powerful new tool to measure and track progress. Through improved reporting and access to conservation data, USDA and the public will be able to understand and monitor conservation and productivity trends and progress. Access to this information will also serve as a catalyst for innovation and improved conservation decision-making.

- **Over the next year, USDA will:**
    - Review the array of data we're collecting on conservation practices, and make improvements to conservation reporting systems to identify:
        - The most useful data for tracking progress towards goals;
        - Gaps in the data that USDA currently collects that prevent large-scale trend analysis in production and conservation adoption trends;
        - Improvements in data collection and reporting;
        - Trends in production and conservation adoption;
        - The effects of conservation on natural resources; and
        - The most useful data for tracking food loss and waste.
    - USDA will recommend improvements to conservation reporting systems which will be regularly updated, leveraging data from existing USDA surveys. This new reporting will contain timely and detailed trend data on agricultural conservation adoption, as well as production, to track progress toward meeting our goals.

- **Hold Ourselves Accountable with Benchmarks:** USDA has outlined benchmarks to hold us accountable as we stimulate innovation so that American agriculture can achieve the goal of increasing U.S. agricultural production by 40 percent while cutting the environmental footprint of U.S. agriculture in half by 2050. This will be an on-going effort toward meeting the demands of the future.

- **Agricultural productivity:** Increase agricultural production by 40 percent by 2050 to do our part to meet estimated future demand.
- **Forest Management:** Build landscape resiliency by investing in active forest management and forest restoration through increased Shared Stewardship Agreements with States.
- **Food loss and waste:** Advance our work toward the United States' goal to reduce food loss and waste by 50 percent in the United States by the year 2030, from the 2010 baseline.
- **Carbon Sequestration and Greenhouse Gas:** Enhance carbon sequestration through soil health and forestry, leverage the agricultural sector's renewable energy benefits for the economy, and capitalize on innovative technologies and practices to achieve a net reduction of the agricultural sector's current carbon footprint by 2050 without regulatory overreach.
    - Multiple pathways exist to achieve this goal, including promoting innovation and new technologies and practices to improve fertilizer and manure management, capturing biogas, improving livestock production efficiency, conserving sensitive and marginal lands to enhance carbon sinks, reforestation and responsible forest management to prevent wildfire, maximizing the benefits of renewable energy through improved efficiency and carbon capture, and encouraging soil health practices such as no-till to sequester carbon.
- **Water Quality:** Reduce nutrient loss by 30 percent nationally by 2050.
    - Address the areas with the greatest needs.
    - Support existing watershed goals.
- **Renewable Energy:** Support renewable fuels, including ethanol, biodiesel, and biomass.
    - Increase biofuel feedstock production and biofuel production efficiency and competitiveness to achieve market-driven blend rates of E15 in 2030 and E30 in 2050. Achieve market-driven demand for biomass and biodiesel.