TEXAS A&M AgriLife RESEARCH

Connecting Texas Agriculture, People, and Environment for Health and Prosperity

Exceptional Item Request
FY 2020–21
$34 Million

Objective
Using food and agriculture to improve quality of life, reduce health-care costs, and sustain agriculture in Texas.

Texas A&M AgriLife Research proposes a collaborative program with the Texas A&M AgriLife Extension Service to connect agriculture, food, and health via research and technology development.

The aim of this initiative is to advance Texas' prosperity. Utilizing established programs and populations, Texas A&M AgriLife will (1) develop and use point-of-care technologies to measure high-resolution health status markers, (2) work with producers to develop foods that enhance health and increase agricultural profitability, and (3) employ 'big data' to help policy makers make integrated health, environmental, and agricultural decisions.

Background

Agriculture has an unrealized opportunity to boost prosperity and substantially reduce diet-related chronic diseases, which cost the U.S. economy $1 trillion annually. Agricultural products and technologies can promote public health, reduce health-care costs and lower the rates of chronic diseases. To better connect long-term health to food and nutrient intakes, a comprehensive evidence base is needed. This Texas initiative will develop and apply such a base. Information on the desired nutritional composition and quality of commodities would benefit consumers and be profitable to Texas agricultural producers.

Health-care costs are skyrocketing in Texas. Obesity costs Texas business $11 billion per year, and that cost is estimated to rise to more than $30 billion by 2030. Furthermore, the state now spends more than $25 billion of its General Revenue each biennium on Medicaid. If we utilize food and agriculture to decrease this expenditure by only 1%, the savings would be more than $250 million. Patrick Stover, vice chancellor for Texas A&M AgriLife, and his research group have demonstrated that 'precision nutrition' can ameliorate disease and associated costs. The team's research and efforts in promoting folic acid food fortification and dietary supplementation have significantly reduced the incidence of neural tube birth defects.

In addition to the public health attributes of this initiative, the $5 billion per year Texas crop industry would benefit from better defense against pests, diseases, and drought. Likewise, the $12.9 billion per year Texas livestock industry would benefit from improved forage and feed, better treatments for infectious diseases, and collective efforts to improve quality and value.

Precision Nutrition and Agriculture

AgriLife Research will create technologies that rapidly assess a person's health, disease progression, and blood nutrient levels. Importantly, this will allow Texans to monitor their health on a mobile device and make immediate behavior changes. Such real-time monitoring increases self-awareness, leading to better health choices, habits, and outcomes.

We will also use modern technologies to provide nutrients or rapid diagnosis, prevention, and treatment for individual plants and animals. Such uses of drones, robotics, sensors, and other technologies will reduce disease spread, maximize plant and animal health and production, and lower the use of water, pesticides, and antibiotics.

Foods for Enhanced Health

AgriLife Research and AgriLife Extension will develop agricultural products that better respond to community needs and consumer demands. Using breeding and genomics, we will develop crops, feeds, and other products with enhanced value, higher yield potential, enhanced nutritional value, and greater resistance to drought, heat, and diseases. Examples include those that

► advance enhanced health attributes (e.g. black sorghum with high antioxidant levels and new spinach varieties high in phytonutrients)

► are naturally low-allergen crops and whole-grain foods

► are good sources of healthy fats

► align with dietary guidelines informed by scientific discovery

► have improved durability, consistency, flavor, nutrients, quality, or texture

► advance the use of rumen microbes to enhance food digestion by livestock

► enhance strategies for animal production and environmental stewardship

Integrated 'Big Data' Decision Making

Texas A&M AgriLife will establish a multidisciplinary collaboration across agriculture, food production, nutrition, and health systems fields.

Application of modern technologies in data collection, computation, and artificial intelligence will allow us to provide holistic scientific information on agricultural and food-related issues for policymakers, so they can create policies that improve health outcomes and reduce health-care costs.

Much like response to medication varies with a person's ancestry, age, and many other factors, responses to a "healthy diet" also vary. This initiative will provide the thorough and integrated science needed to avoid unintended consequences when determining dietary guidelines, food-related public policies, and production decisions.

Impact of Funding

Connecting Texas Agriculture, People, and Environment for Health and Prosperity

► Heighten the nutrition, yields, and hardiness of crops by using gene-editing approaches.

► Speed up development of new products by using precision-agriculture tools.

► Create nondisruptive methods for early detection of disease, insects, and drought.

► Develop uniquely Texan foods with powerful health benefits, such as Onyx sorghum, a sorghum variety with unprecedented antioxidant levels.

► Develop delicious Texas fruit and vegetable varieties like our mild jalapeño or Texas sweet onion.

► Create rapid, nondisruptive methods to detect diseases such as respiratory disease in cattle and chronic wasting disease in deer.

► Track infestations of pests such as cattle fever ticks by using advanced sensors.

► Find genetic targets for new vaccines and treatments of cattle fever, chronic wasting disease, and other diseases.

► Though only 0.3% of veterinary antibiotics are similar to those used in medicine, decrease unnecessary antibiotic use to address concerns about antibiotic resistance.

AgriLife Research will partner with AgriLife Extension's ongoing consumer-oriented programs such as Healthy Texas, Dinner Tonight, and Path to the Plate to encourage Texans to adopt healthier ways of eating.

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MEMBER OF THE TEXAS A&M UNIVERSITY SYSTEM

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Texas A&M AgriLife

What is AgriLife? It's a simple word for a diverse organization. With teaching, research, extension education, laboratory, and forestry facilities throughout Texas, we serve people of all ages and backgrounds. Led by Patrick J. Stover, vice chancellor for agriculture and life sciences, Texas A&M AgriLife includes the Texas A&M AgriLife Extension Service, Texas A&M AgriLife Research, Texas A&M Forest Service, and the Texas A&M Veterinary Medical Diagnostic Laboratory.