STRATEGIC PLAN

TEXAS A&M AGRILIFE RESEARCH

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TEXAS A&M AGRILIFE RESEARCH STRATEGIC PLAN

Informing Our Agency Strategic Plan

A strategic planning task force of Texas A&M AgriLife Research faculty and administrators have guided the development of the following aspirational strategic plan for our agency. The task force reviewed AgriLife Research's existing vision and mission statements and considered them against input from a range of internal and external constituents.

Approximately 360 faculty and research staff responded to an internal survey, and 250 people responded to an external survey that informed a comprehensive analysis of AgriLife Research. This strategic plan is based on in-depth discussion and a subcommittee analysis of agency strengths, weaknesses, opportunities, and threats (SWOT).

The research priorities identified in this strategic plan aim to elevate AgriLife Research's impacts for all Texans and beyond, making AgriLife Research the most recognized national authority in agricultural, natural resource, and life sciences research.

An adaptive strategic planning process has been implemented to detect and respond to variability across a broad scope spanning agricultural policy, environments, economies, and related impact areas over the next five years.

Adaptive Strategic Planning

Adaptive strategic planning is a process that applies integrated core values and responses to varying opportunities and challenges. It enables innovation, creativity, scientific excellence, and public service through inclusive leadership and teamwork.

Adaptive strategic planning can improve AgriLife Research's established research procedures and strategies by modifying traditional research management tactics, learning to adapt more intuitively, and taking advantage of the input of an exceptional agricultural faculty and staff.

Effective adaptive strategic planning requires mechanisms that promote innovative ideas evaluated in an iterative or repetitive process, leading to continuous improvements in action plans and delivered outcomes.

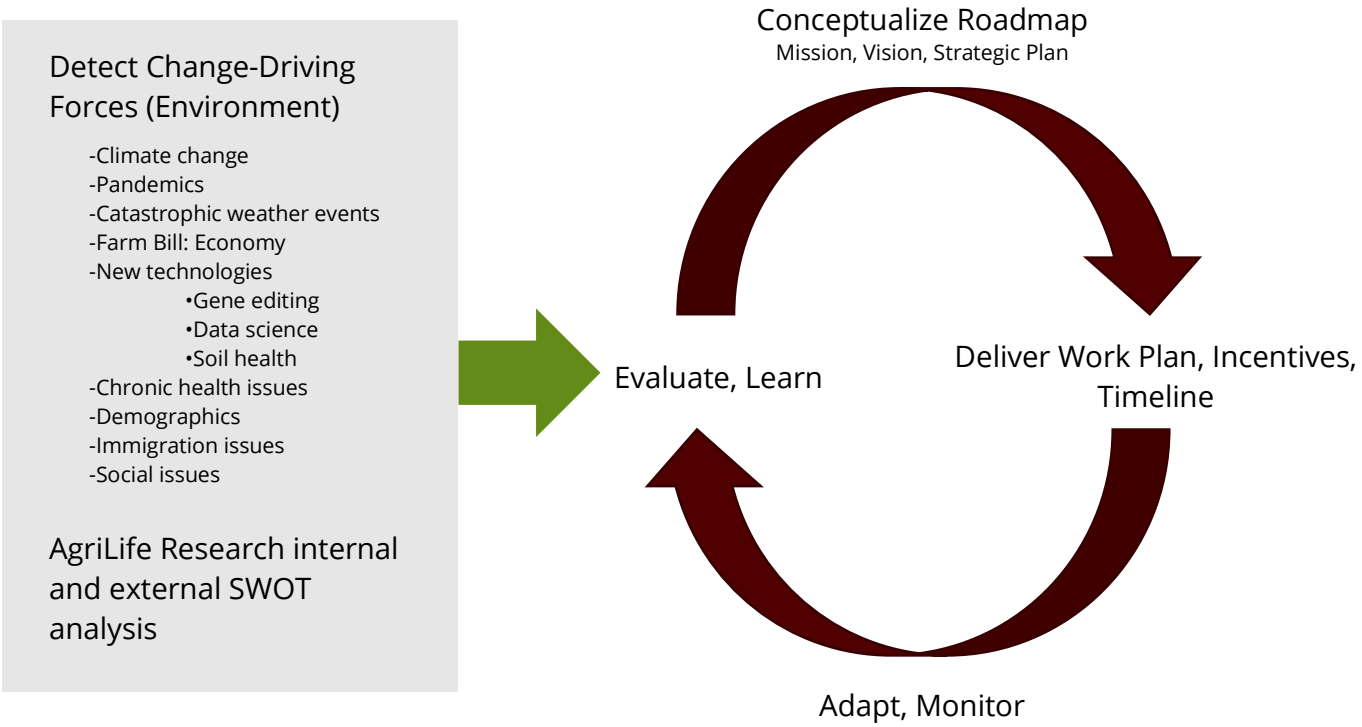


Figure 1. Dynamics and mechanisms of the proposed adaptive strategic plan

An adaptive strategic plan evaluates and responds to new relevant information with implications for AgriLife Research's portfolio (Figure 1). Our proposed mechanism will:

- Invite innovative ideas and proposals for critical evaluation of potential outcomes and impacts using transparent metrics of success
- Develop action plans and define objectives, timetables, and incentives for meritorious proposals
- Adapt, monitor, and evaluate progress in gains made by AgriLife Research's research portfolio arising from strategic shifts in the plan
- Detect changes, learn, survey, and explore the environment to identify and gauge driving forces and new technologies

The adaptive strategic plan will use a defined process carried out by a small, independent, and critical group of AgriLife Research leaders to rapidly advance meritorious ideas through the evaluation and refinement processes for presentation to decision-makers.

BACKGROUND AND INTRODUCTION

Our Roadmap: Vision, Mission, Core Values

Vision

Healthy lives and livelihoods improved through abundant, affordable, and high-quality food and agricultural products in Texas and around the world.

Mission

Create, learn, and share knowledge about agriculture and the life sciences that nourishes health, strengthens communities, protects natural resources, and supports economies.

Core Values

- Leadership
- Respect
- Loyalty
- Integrity
- Scientific excellence
- Creativity
- Innovation
- Agility
- Teamwork
- Accessibility
- Responsiveness
- Exemplary public service

These values reinforce Texas A&M AgriLife Research's commitment to delivering cutting-edge scientific tools and innovative solutions for Texas producers, industry members, and both urban and rural communities to support the nourishment and well-being of all people. These efforts lead to the stability and continual enhancement of our state's agroecosystems and natural resources, further ensuring the economic competitiveness and excellence of agriculture and human health.

Defining Strategic Priorities

AgriLife Research is working to find innovative solutions that will create adaptive agricultural systems — systems that can meet the demand of a growing population, changing climate, fluctuating economic conditions, unpredictable geopolitical environments, declining resources, and public health crises. Our strategic plan aims to make fundamental scientific discoveries and apply them to create new technologies that will enhance the sustainability and resilience of adaptive agricultural systems. These efforts provide the translational research necessary for developing and producing high-quality, safe, and sustainable food and fiber systems with local, national, and global impact. These agile systems can meet the needs not only of food and fiber but also of clean water and air, functional landscapes, improved health and well-being, and the sustainability of resources for generations to come. This strategic plan includes the discovery, dissemination, and adoption of evidence-based research focused on the intersection of nutrition, human health, and agriculture.

Strategic priorities are areas that AgriLife Research will emphasize over the coming years to make measurable progress toward enhancing the resilience of agricultural systems and ensuring an abundant supply of high-quality, nutritious foods for our citizens. After reviewing the vision and mission, evaluating the competitive advantages, and considering the context of the obstacles to sustainable systems, the following four broad priority areas became clear:

Priority One: Leading-Edge Research and Innovations

Discover new innovations, technologies, and science-based solutions to enhance agricultural and ecological systems and the life sciences.

Priority Two: Sustainable Production Systems

Provide the translational research necessary to develop and produce high-quality, safe, and sustainable food and fiber systems with local, national, and global impacts.

Priority Three: Economic Strength

Enhance the efficiency, profitability, and resiliency of agriculture, natural resources, and food systems in the state of Texas and around the world.

Priority Four: Healthy Living

Discover, disseminate, and facilitate the adoption of scientific evidence at the intersection of nutrition, human health, and agriculture.

Synergistic Interactions Between Priorities

These four research priority areas interact synergistically to deliver healthy living to Texans (Figure 2). Innovative research is the foundation of this strategy, which empowers the nexus between agriculture and human health by cultivating science-based solutions to develop sustainable, profitable, and resilient agriculture that provides affordable, high-quality, nutritious food.

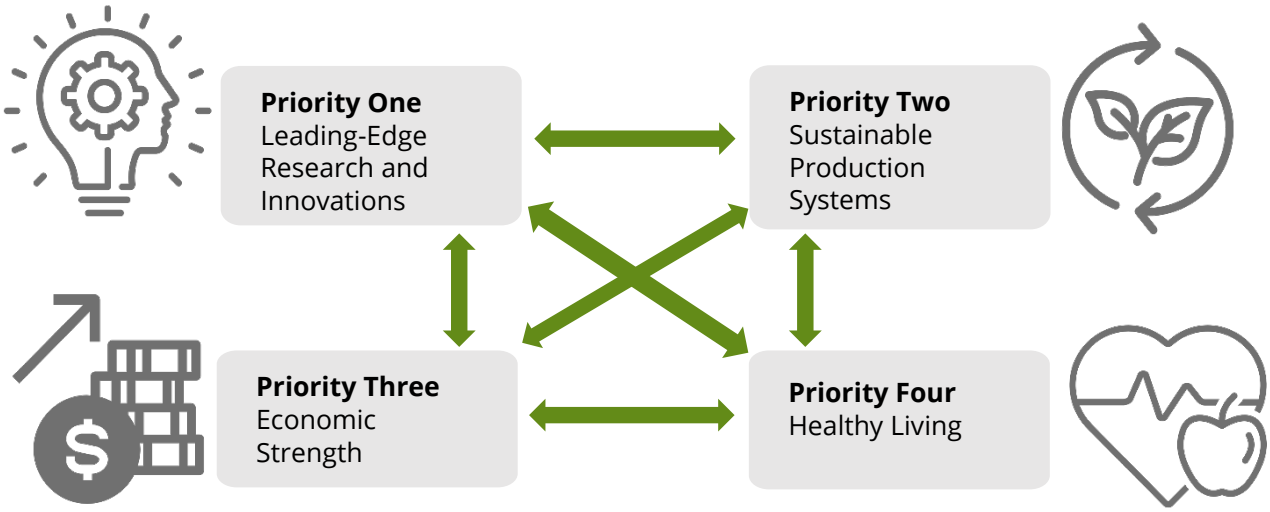
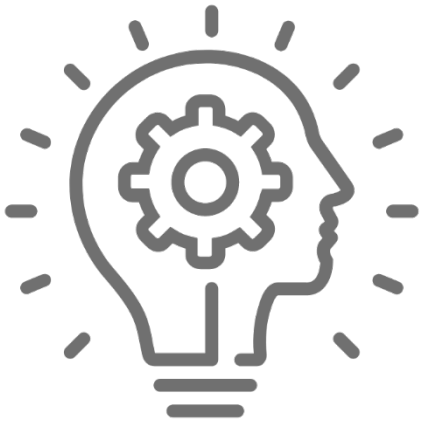


Figure 2. Synergistic interactions among our four research priority areas

AGRILIFE RESEARCH STRATEGIC PRIORITIES

Priority One: Leading-Edge Research and Innovations



Discover new innovations, technologies, and science-based solutions to enhance agricultural and ecological systems and the life sciences.

Priority One focuses on generating cutting-edge discoveries, knowledge, and other resources in plant, animal, and natural resource systems that are foundational to translational agricultural and ecological systems and life sciences research. New discoveries and technologies must be assimilated into research to catalyze mission-relevant innovation, discovery, and resource development. Major advances have occurred in new genetic, genomic, molecular, bioinformatics, imaging, spectroscopy, big data, communications, robotics, and artificial intelligence technologies. Their ramifications on agricultural and ecological systems and the life sciences will be multidimensional and diverse. For example, imaging and robotics advances have rapidly expanded footprints in diverse areas of contemporary basic and applied research. Also, some advances are already used to create, discern, categorize, and apply biological, genetic, and epigenetic variations, and to discover their mission relevance. Research and engineering that integrates new knowledge, technologies, and instruments are often key to their successful use in science and application.

New technologies, such as new genetic and genomic technologies, must be integrated into efforts that harness existing genetic diversity in plants and animals for profitable, productive, and sustainable solutions appropriate for evolving production systems. Goals include developing new technologies and identifying genetic resources to improve the performance of plants and animals. This may also involve using new technologies and biodiversity to produce new varieties or breeds that meet the needs of sustainable production systems with attention to the impacts of climate, unpredictable weather events, and disease on local communities.

Priority One also addresses the need to access, contribute, assemble, and use relevant data and information involving crop and animal germplasm, agroecosystem expertise, climate, and biotic and abiotic stresses to develop and assess the site-

specific suitability for producers, as well as evaluate long-term health and the environmental risks related to new varieties/breeds.

The research includes, but is not limited to:

- Plant and animal improvement using the latest technologies, such as genome editing, bioengineering, synthetic biology, and breeding tools
- Gene editing systems — develop methods to create valuable mutations in model and non-model organisms and/or cell lines
- Gene drive systems — develop means to control pests, pathogens, parasites, or vectors
- Characterize natural and induced plant diversity more comprehensively and in new dimensions
- Animal and plant genetics — improve productivity, disease resistance, and nutritional value
- Plant and animal health, microbiomes, endophytes, and beneficial interactions
- Animal diseases (endemic, zoonotic, emerging, re-emerging, and foreign) — detect, mitigate, control, or eradicate
- Existing and emerging plant diseases and pathogens (for example, insect-vectored, fastidious) — detection, identification, control, prevention, and/or treatment
- Bioenergy/biofuels — new value-added bioproducts and processes

Expected outcomes:

Leading-edge research and engineering conducted in this priority would empower the discovery of new knowledge, develop new technologies, and create science-based solutions to achieve economic efficiency, resiliency, and sustainability of food production systems. Using genomics/bioinformatics, modern genome-editing, bioengineering, and breeding tools combined with the benefits of exploring genetic diversity and data science would lay the groundwork to further improve animal and plant varieties. Big data, AI, model systems, and other approaches that lend themselves to robust inferential approaches may be especially valuable in alleviating problems that have been most recalcitrant to conventional approaches (for example, understanding and improving crop root systems). Priority One research will increase

knowledge of animal, soil, and plant microbiomes and benefits to the food production system. It will also lead to gaining fundamental knowledge in early, rapid detection, mitigation, and prevention of plant and animal diseases; the mitigation of biotic and abiotic stresses; and improvement of the nutritional value of foods.

Priority Two: Sustainable Production Systems

Provide the translational research necessary to develop and produce high-quality, safe, and sustainable food and fiber systems with local, national, and global impact.

Priority Two addresses agricultural productivity and environmental sustainability, key components of resilient production systems. This priority takes advantage of new discoveries and scientific advances that generate a wealth of information on agriculture system elements. For instance, CRISPR technology allowed the creation of more diverse crops and livestock, permitting the development of new food sources and traits. Innovative crop and animal production systems can lead to improved carbon sequestration strategies. These, in turn, make agriculture systems more resilient to biotic and abiotic stresses, increase yields, and enhance the quality of food, feed, and fiber.

The agriculture sector has the potential to be a net carbon sink for greenhouse gases because of its ability to sequester carbon in soil and plants and reduce methane and nitrous oxide emissions. Conservation agriculture, crop rotations, residue management, animal agriculture, and minimizing food waste are practices that can increase productivity and have economic, environmental, and social benefits. However, carbon credit markets will need effective methods to quantify and verify changes in soil carbon stocks. Successful research programs within this priority will require transdisciplinary teams that can integrate knowledge and tools from the life, health, and social sciences with engineering and computing sciences, thus creating a synergistic effect at the interface of multiple disciplines.

The research includes but is not limited to:

- Soil health — sustainability, reducing loss and degradation
- Soil-plant resiliency — increasing soil organic matter and improving microbiome interactions
- Optimizing the use of water in crop production
- Increasing nutrient use efficiency in crop production systems

- Animal epigenetics, reproduction, nutrition, and welfare
- Precision livestock production systems
- Precision crop production systems
- Carbon sequestration promotion/quantification methodology
- Agriculture production under protected environments
- Using systems approach for digital in-season crop management systems
- Digital forage/livestock production systems
- Internet of things and connectivity in agriculture
- Responsive agriculture
- Role of pathogens in food, food safety, and security

Expected outcome:

Priority Two takes advantage of leading-edge research, technologies, and genetics to provide the translational research necessary for developing and producing high-quality, safe, and sustainable food and fiber systems with local, national, and global impact. Sensor and remote sensing technology (for example, unmanned vehicles, connectivity) will enable rapid detection and monitoring of processes across all areas of the food production chain, resulting in:

- Advanced high-throughput phenotyping systems based in machine learning
- Satellite-based automated systems for in-season large-area prescription management and yield forecast.
- Controlled environment agriculture for horticultural crop production systems
- Precision livestock farming
- Nutrition modeling
- Artificial intelligence and decision support systems

Work in this area will require transdisciplinary cooperation to integrate components of the food system into a functional and sustainable production enterprise.

Priority Three: Economic Strength

Enhance the efficiency, profitability, and resiliency of agriculture, natural resources, and food systems in the state of Texas and around the world.

Priority Three focuses on the food production systems' economic strength and profitability. While this system has, at times, been strained by drought, freezing weather, labor and trade issues, and, more recently, by catastrophic weather events and a global health crisis, it is resilient. It continues to produce and deliver a variety of nutrient-dense foods needed to maintain our health. U.S. consumers are blessed by the abundance and relatively low cost of food, expending only 6.4% of their income on food at home. The diversity of Texas' food supply is one of the state's greatest strengths. As the food supply chain has faced these challenges, research that provides a diverse, consumer-oriented food supply has enabled the state to offer the public other food sources, such as animal meat protein, milk, grains, and fruits and vegetables, and food delivery methods. Research under this priority will lead to new production systems resilient to environmental challenges, and the identification of new and expanding markets capable of providing healthy, safe-to-eat, locally produced food.

The research includes but is not limited to:

- Profitability of controlled-environment agriculture systems under greenhouse or protected environments (hydroponics, aeroponics, vertical farming, plant factories)
- Optimizing animal and plant production systems from agriculture to consumer use
- Developing food processing and safety procedures to enhance agricultural product diversity
- Alternative, abundant, and high-quality water sources
- Relationship between energy availability and economic strength
- Carbon Credit strategies for producers
- Water policies/pricing/demand
- Economic and cost-benefit analysis

- Agriculture and food policy analysis
- International market opportunities and challenges
- Transportation and infrastructure challenges

Expected outcome:

Priority Three will result in a better understanding of how changes in the production environment and agriculture policies affect the profitability and resiliency of the food supply chain. Economic and cost-benefit analyses will guide producers, consumers, and policymakers on the economic viability of new plant and animal production systems, considering socio-economic production constraints, as well as transportation and infrastructure needs. Constant feedback between this priority and priorities one, two, and four is paramount for the economic and environmental sustainability of the Texas production system. Economic and sustainability analyses will allow more efficient allocation of precious resources by identifying current and future opportunities and threats to satisfy the constantly growing food, nutrition, and human health demands and challenges for Texas and the world.

Priority Four: Healthy Living

Discover, disseminate, and facilitate the adoption of scientific evidence at the intersection of nutrition, human health, and agriculture.

Priority Four concentrates on nutrition and human health. Food contains macro- and micronutrients essential to provide energy, meet physiological needs and functions, and help prevent or mitigate the burden of many chronic diseases. The consumption needs of humans are complex. Therefore, understanding the interactions between food access, availability, choice, consumption, and composition is critical in the context of individual nutrition needs and growing global food system demands. This understanding is also essential for supporting food environments and product development that meet consumer preferences and nutritional needs to optimize human health throughout the lifespan.

Optimizing food systems for economic, environmental, and human health includes consideration of food waste and food safety. Food waste is responsible for billions of dollars lost in food productivity and availability for consumers. In addition, food safety issues add to these losses. According to the Centers for Disease Control and Prevention, food-borne diseases cause approximately 50 million illnesses and contribute to more than 125,000 hospitalizations and about 3,000 deaths in the U.S. each year.

The research includes but is not limited to:

- Discovering evidence relating nutrients in food and human disease prevention
- Precision nutrition and health across the lifespan
- Consumer preferences and acceptances in diverse populations
- Community-engaged intervention, development, and testing
- Dissemination, including implementation of science and policy-related initiatives
- Technology innovations to capture real-time consumer responses to interventions
- Targeted message delivery to test or support behavioral adoption/adherence

- Facilitating the translation of effective interventions with relevant systems and partners (AgriLife Extension, health care, public health, community-based organizations)
- Nutritional optimization of foods in the marketplace
- Food waste/losses/mitigation
- Food safety/security
- Food design engineering — packaging, conservation

Expected outcome:

Focused on nutrition and human health, Priority Four integrates fundamental knowledge and new discoveries from the other priority areas to create an interdisciplinary pathway toward cutting-edge innovations, translational research, and a broad spectrum of dissemination strategies that advance human health through agriculture and food system optimization. Work in this area is expected to:

- Illuminate consumer preferences, acceptance, and demand in diverse communities
- Rigorously evaluate the effects of prescriptive diets and/or nutritional products on a variety of health-related outcomes
- Develop technology and tools that enable consumer adoption of personalized dietary and related health recommendations
- Identify mechanisms by which pathogens in food and animals contribute to food safety issues and develop food safety mitigation strategies
- Facilitate the adoption of relevant programs and approaches to improve public health through nutrition

AGRILIFE RESEARCH COMPETITIVE ADVANTAGES

AgriLife Research is the leading research and technology development agency in Texas for agriculture, natural resources, and the life sciences. Since 2017, it has been ranked #1 by the National Science Foundation among its peers regarding federal funding in agricultural sciences and natural resources conservation. AgriLife Research is supported by 15 academic departments of the Texas A&M University College of Agriculture and Life Sciences, five departments within the School of Veterinary Medicine and Biomedical Sciences, 13 Research and Extension centers across Texas, and eight multidisciplinary institutes. More than 600 academic faculty contribute to AgriLife Research initiatives.

In addition, AgriLife Research manages several state-of-the-art core research facilities, such as:

- The AgriLife Genomics and Bioinformatics Service, which provides support to researchers on nucleic acid sequencing and genotyping
- The Texas A&M Institute for Genomic Medicine, where animal models are used to address chronic diseases
- The National Center for Electron Beam Research facility, which engages with the food industry and with NASA to examine the use of non-ionizing irradiation to enhance the safety and shelf stability of foods
- The Multi-Crop Transformation Facility, where modern plant genetics are studied in cell culture and then those cells are stimulated to develop whole rooted plants for field testing
- The Plant Growth and Phenotyping Facility, which develops big data solutions for the precision growth dynamics of crop plants

The research carried out by AgriLife scientists applies to a variety of systems, providing solutions to agriculture- and life-science-related challenges at the state, national, and international levels.

Texas is geographically and climatically diverse. The state provides a platform for AgriLife Research scientists to develop solutions relevant to a vast array of global agricultural issues. Variations in precipitation and humidity, elevation, salinity, soil textures, solar radiation, and average daily temperatures across Texas make statewide research relevant to most of the world's ecosystems and overall global

issues. Diverse funding sources enable AgriLife Research to study agriculture-related matters of importance to Texas, the nation, and many other countries.

A sample of the many possible researchable areas include:

- Improving the efficiency of food production while conserving soil, water, and natural resources
- Genetic improvements of plants and animals
- Developing novel food processing technologies
- Pathogen and pest control strategies
- Bioenergy
- Zoonotic diseases
- Animal and human nutrition
- Production economics
- Trade
- Effects of climate change on all the above
- Policies to help mitigate the effects of climate change

Through enduring investments in research, AgriLife Research has accumulated growing volumes of data from genomics, phenomics, phenotyping, livestock, field crops, and rangeland management. This availability of data presents a marked, if not unique, occasion to identify research focal points that will address agricultural threats and opportunities. Appropriate big data analyses that integrate the perspectives of agriculture, biology, physics, mathematics, computer science, and engineering can provide the necessary insight and understanding to illuminate key current and future opportunities and challenges in food production.

OUR COMMITMENT: STRENGTHENING OUR CAPACITY TO SERVE

Continuing to advance agriculture in our four priority areas requires a corresponding commitment to grow and strengthen the scientific enterprise of AgriLife Research by enhancing research capacity, productivity, and impact.

Goals and tactics:

- Invest in faculty and staff recruitment and retention.
- Invest in faculty support programs and other initiatives to enhance the ability of faculty to secure extramural funding and advance scholarship.
- Improve research infrastructure and facilitate access to state-of-the-art equipment, facilities, instrumentation, and services.
- Integrate the research administrative management of the School of Veterinary Medicine and Biomedical Sciences and associated faculty with AgriLife Research.
- Recognize and reward faculty and staff successes by nominating them for internal and external awards.
- Support training of next-generation scientists, including graduate students and postdoctoral researchers.
- Foster communication with internal stakeholders and nurture relationships with external stakeholder groups.
- Develop mechanisms for securing funding from private entities and other stakeholder groups to advance the AgriLife Research mission.

APPENDIX: TEXAS AGRICULTURE, NATURAL RESOURCES, THE FUTURE

Agriculture

By 2050, the U.S. and world population are expected to increase by 30%, and global real incomes per capita are expected to double. Population and income growth translate into higher demand for both staple products and high-valued foods, such as more animal and plant proteins, fruits, and vegetables. Higher real incomes also mean a growing demand for livestock and feed for livestock. As a result, agricultural productivity has increased dramatically over the years. Today's farmers produce 262% more food with 2% fewer inputs than in 1950. A major component of this increase in agricultural productivity is due to investments in public agricultural research with a benefit-cost ratio of 32, which means that every dollar spent on public agricultural research and extension returns 32 dollars to society. Therefore, large benefits exist for investments in U.S. public agricultural research.

Rapid agricultural productivity increases, relative to gains in other food sectors of the U.S. economy, have translated into falling real prices of food consumed at home. For example, in 1948-2018, the share of U.S. household income spent on food at home declined from 22.3% to 6.4%, while total food consumption increased. With Americans spending 6.4% of their income on food, the other 93.6% is available for spending on a wide range of other goods and services, including recreation, housing, transportation, education, and health care. Therefore, the long-term rise of civilization and living standards worldwide largely tells a story about increasing agricultural productivity. The U.S. is the largest exporter of agricultural products. Since 95% of the world's population lives outside the U.S., the possibilities and opportunities to continue feeding the world are endless.

Agriculture has long been a mainstay of the Texas economy, and the success of Texas agriculture has paved the way for the development of new industries and sustained the diversification of our economy.

The food and fiber systems' contribution to the Texas gross domestic product (GDP) was valued at $145.8 billion in 2017. This represented 9.1% of the state's total economic activity. The top ten commodities in market value are cattle, cotton, milk, broilers, greenhouse, sorghum, wheat, fruits, vegetables, and eggs (Figure 3).

Additionally, agriculture-related activities such as hunting, fishing, and recreation, among others, are worth over $2 billion.

Cattle	$12.3 billion
Broilers	$2.9 billion
Cotton	$2.6 billion
Milk	$2.1 billion
Corn	$1.1 billion
Greenhouse	$840 million
Fruits and Vegetables	$629 million
Eggs	$500 million
Sorghum	$490 million
Wheat	$276 million

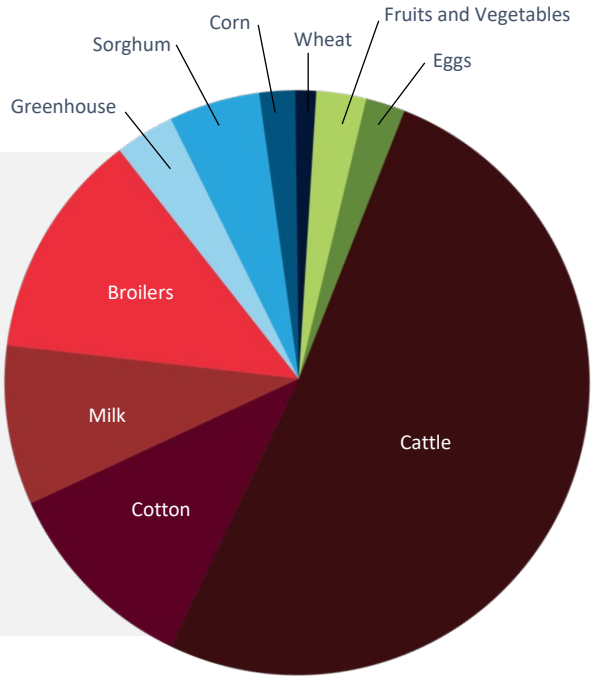


Figure 3. Texas top 10 commodities in terms of market value

Texas is the top state in the nation for producing crude oil, natural gas, and wind-based energy, which provide significant competitive advantages. In 2020, Texas accounted for 43% of the nation's crude oil production and 26% of its marketed natural gas production. Texas also has abundant renewable energy resources. It is first in the nation in wind-generated electricity and a leader in biomass-based renewable energy. With many sunny days across vast distances, Texas is also a leader in solar energy potential. Ranking second in the nation in both population and economy, Texas consumes a large share of the nation's energy. Therefore, as U.S. and world economies grow, two main variables sustain such growth — energy and food — and Texas is a key player in both. Integrating and taking advantage of the synergies of both industries will contribute greatly to the continued growth of the Texas and U.S. economies.

Natural Resources

Texas's natural resources are expansive, with nearly 172 million acres of landmass. The state is home to more than 142 mammal species as well as 615 bird species, of which half are migratory.

Freshwater lakes, ponds, and reservoirs cover about 1.2 million Texas acres. This includes nearly 185,000 miles of river, more than 350 miles of coast along the Gulf of Mexico, and 1,254 miles along the Rio Grande bordering Mexico. Texas waters house more than 250 freshwater fish species and 1,500 saltwater species.

Within this natural ecosystem, 141 million acres — more than 80% of the state's total acreage — consist of privately owned working lands and more than 60,000 working landowners. Texas working lands are privately owned farms, ranches, and forests producing agricultural products. This includes 25.8 million acres of cropland, 105.8 million acres of grazingland, 8 million acres of timber, 5.3 million acres of wildlife management, and more than 780,000 acres of other working lands.

At the same time, from 1997 to 2017, Texas lost approximately 2.2 million acres of working lands converted for nonagricultural uses. Of those acres, 1.2 million were converted in the last five years.

The Future

Texas is becoming an urban state and is home to four of the top 10 most populous cities in the country (Houston, San Antonio, Dallas, and Austin) and 69 of the top 780 cities. The Census Bureau estimates that Texas has three of the ten fastest-growing counties in the country (Hays, Comal and Kendall) and almost a quarter of the top 100 fastest-growing counties. Although Texas has a large rural population, almost 4.5 million, it only accounts for about 15% of the total, which means that around 25 million people live in urban areas.

The COVID-19 global pandemic pushed the world several years prematurely into cyberspace and wreaked havoc on the global food supply chain, causing tremendous decreases in food security. Texas was no exception. COVID-19 exposed Texans' poor health status regarding obesity, hypertension, diabetes, heart diseases, and other chronic diseases related to diet and nutrition. COVID-19 also revealed the need to examine food production and distribution systems, uncovering the need for a more

agile food supply system that provides nutritious, affordable, and accessible food to consumers while financially supporting our farmers, ranchers, and agricultural workers, even when there are multifactored disruptions at one time throughout the supply chain.

We are keenly aware that hunger, specifically undernutrition, is one of our most important global issues. Both a cause and a symptom of poverty, it can ultimately lead to conflict, mass migrations, and the rise of terrorism, all of which can impact Texans. We believe that we can help alleviate human suffering associated with hunger and poverty through agricultural science and, in that way, help prevent these outcomes while building a better world for present and future generations. With proper investment today, AgriLife Research will set the foundations of the infrastructure necessary to ensure food security for future generations.

Over-nourishment presents a double-burden paradox that affects nutrition and increases the risk of chronic diseases. Texas agriculture and AgriLife Research are uniquely positioned to partner to improve public nutrition and health by providing a healthier, more nutritious, and abundant food supply.

As Texas agriculture grows, it has a positive multiplier effect throughout the economy. For every dollar of agricultural production in Texas, another $2.19 is generated by other industries in the state to support this additional output. The interconnected nature of Texas agriculture to other sectors of the economy — and the everchanging relationships across these sectors — make it imperative that AgriLife Research is positioned to anticipate and respond to critical needs and emerging challenges.

AgriLife Research's roots are firmly embedded in production agriculture and natural resources. We seek to expand the agency's focus to apply the power of fundamental life sciences to solve real-world issues. Discoveries in genetics, crop and animal management systems, and links between poor human nutrition and chronic diseases are accelerating our impacts on sustainable food and fiber supply chains. Our approach integrates basic and applied research to create, as stated in our vision, "healthy lives and livelihoods improved through abundant, affordable, and high-quality food and agricultural products in Texas and the world."