

STRATEGIC PLAN

Texas A&M AgriLife
Research and
Extension Center at
San Angelo and
Sonora

TEXAS A&M
AGRILIFE
RESEARCH

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STRATEGIC PLAN, TEXAS A&M AGRILIFE RESEARCH AND EXTENSION CENTER AT SAN ANGELO AND SONORA

Vision

Improved Texan livelihoods through abundant, affordable, and high-quality food and fiber, while enhancing the natural resources and environment that sustain a healthy ecosystem.

Mission

- Develop “ranching solutions” for West Central Texas stakeholders that benefit from these resources.
- Enhance livestock production, particularly small ruminants, through technological innovations that sustain healthy, productive, and environmentally adapted animals.
- Preserve and enhance natural resources, particularly rangelands, through innovative practices that lead to healthy, resilient, and sustainable ecosystems.

Goal

Provide leadership to West Central Texas agriculture through innovative research and technology transfer to optimize regionally specific agricultural practices, enhance the natural resources, and improve the environmental, economic, and social network of the region.

Priorities of Texas A&M AgriLife Research

The Texas A&M AgriLife Research and Extension Center at San Angelo and Sonora is administrated by Texas A&M AgriLife Research. AgriLife Research’s strategic priorities are areas that the agency will emphasize over the coming years to make measurable progress toward enhancing the resilience of agricultural systems and ensure an abundant supply of

high-quality, nutritious foods for our citizens. These are described in detail in the [agency strategic plan](#).

Strategic 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.

Strategic 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.

Strategic Priority Three: Economic Strength

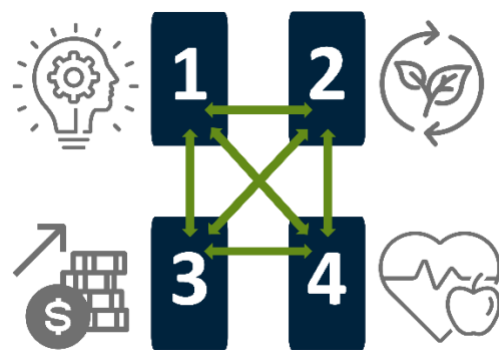
Enhance the efficiency, profitability, and resiliency of agriculture, natural resources, and food systems in the state of Texas and around the world.

Strategic Priority Four: Healthy Living

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

Synergistic Interactions Among Priorities

These four research priority areas interact synergistically to deliver healthy living to Texans. 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.



Strategic Priorities, San Angelo and Sonora

Texas A&M AgriLife Research in San Angelo and Sonora have a rich history of research and collaboration with regional stakeholders to enhance rangeland systems and livestock production, specifically sheep and goats. Center administration and advisory council members have identified key priority areas for research and outreach that build on prior successes and address new areas of interest. Within each of these priority areas for San Angelo and Sonora, efforts align with the strategic priorities of Texas A&M AgriLife Research.

1. Livestock Predation

Issue

- I. Roughly 10 to 20% of lamb and kid crops are lost annually to predation from native and invasive wildlife. These losses aren't sustainable and prohibit a large segment of the ranching community from raising sheep and goats.

Approach

- I. The Texas A&M AgriLife Livestock Guardian Dog (LGD) program conducts research to enhance management of LGDs to protect sheep and goats from predators. In addition, the program works with the ranching community to provide science-based guidance on management of LGDs.
- II. Expand efforts to build a nationally recognized research and outreach program to enhance lethal and non-lethal tools and technologies to protect livestock from predation.

2. Rangeland Health

Issue

- I. Semiarid rangelands within this region of the state have been shifted from a productive grassland savannah to unproductive woodlands due to lack of fire, improper grazing management, and prolonged drought.

- II. Energy production, both renewable and non-renewable, has had and will continue to have an impact on rangeland health in this region and across the state.

Approach

- I. Texas A&M AgriLife has led innovative research and community outreach efforts on the use of prescribed fire, multispecies grazing, proper stocking rates, and strategic herbicide use to slow woodland encroachment and initiate restoration of native rangelands.
- II. Research will continue to investigate and refine management practices to improve native rangeland health, understand and mitigate climate change, sustain agricultural productivity, and enhance wildlife habitat.
- III. Expand rangeland research programs to focus upon long-term rangeland health, environmental impact, and sustaining agricultural production within energy production sites, such as solar and wind farms.

3. Internal Parasite Control

Issue

- I. Internal parasites, particularly stomach worms, are the largest health issue for sheep and goat production, which can lead to significant reductions in performance and, death loss. Reliance on pharmaceutical products for control is threatened as internal parasites have developed some level of resistance to all classes of deworming products.

Approach

- I. Quantitative and molecular genetic prediction tools have been tested and developed to select for sheep and goats that are more able to resist internal parasite infection.
- II. Research will continue to improve these genetic predictors and better understand how these tools can best be applied to sheep and goat production.
- III. The research center provides laboratory services and consultation for sheep and goat breeders to quantify parasite load and make genetic selection decisions for seedstock breeders.

4. Animal Fiber Research and Testing

Issue

- I. In 2020, the US wool trade was left without a domestic wool testing laboratory to test wool core samples for commerce.
- II. A resurgence in demand for high performance animal fiber requires continual improvement in quality fiber production to meet this demand. Texas A&M has one of the last wool and mohair research laboratories in the US to help ranchers meet this demand.

Approach

- I. The Bill Sims Wool and Mohair Research Laboratory worked with the US trade to install new equipment and develop an approved testing service that allows US wool and mohair to be tested for quality and quantity characteristics so that farmers and ranchers can market their product both domestically and internationally.
- II. Research will be conducted to allow sheep and goat producers to improve the quality and quantity of fibers produced that meet the specifications of high-performance garment demand.

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.

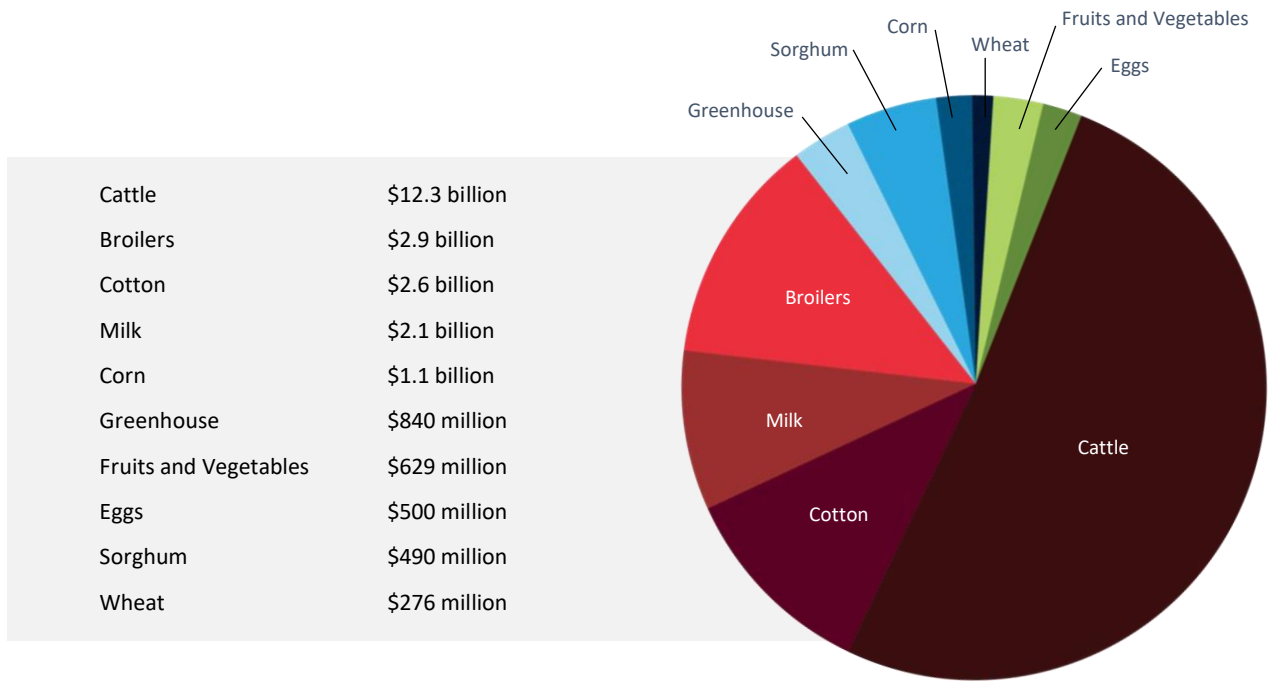


Figure 3. Texas top 10 commodities in terms of market value

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 multifaceted 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."