SORGHUM CHECKOFF
NEWSLETTER
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Sorghum Checkoff Research Powers Breakthrough in Alternative Proteins and 3D-Printed Foods

A Sorghum Checkoff-funded research project is opening new doors for sorghum as a key ingredient in the alternative protein and food innovation space. The multi-year study, conducted by Dr. Ali Ubeyitogullari and his team at the University of Arkansas System Division of Agriculture, focused on enhancing sorghum protein's functionality for advanced food technologies, including 3D food printing.

While sorghum has long been valued for its drought resilience and gluten-free nutrition, its use in food applications has remained limited due to challenges with digestibility, solubility and flavor. This research aimed to overcome those barriers by exploring new processing methods and technologies that elevate the crop's value in emerging food markets.

Researchers developed a novel supercritical carbon dioxide (SC-CO^2) drying method that significantly improved the functional properties of sorghum proteins. Compared to traditional freeze-drying, SC-CO^2 produced protein powders with a porous structure, reduced off-flavors and higher solubility across a range of pH levels. Most notably, digestibility improved by nearly 40 percent, a critical step for food industry adoption.

With these optimized protein concentrates, the team turned to 3D food printing, a technology that creates customized food products layer by layer using edible gels or "bioinks." Sorghum protein gels demonstrated strong printability, especially at 25 percent concentration using specific nozzle configurations. The resulting prints held their shape well and matched design models closely, proving sorghum's potential in high-tech food design.

To further enhance the nutritional profile, researchers developed dual-protein structures by combining sorghum with soy and pea proteins. These blends addressed lysine limitations in sorghum and created more balanced amino acid profiles, opening the door to complete plant-based meals.

"This work expands the possibilities for sorghum in food innovation," said Norma Ritz Johnson, executive director of the United Sorghum Checkoff Program. "By investing in cutting-edge research, we're helping drive demand for sorghum in markets that value sustainability, nutrition and innovation."

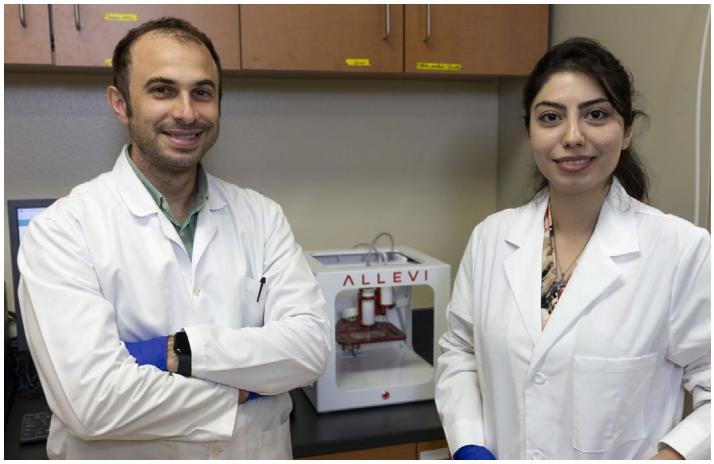
WHAT'S INSIDE

SORGHUM THE SMART CHOICE

In addition to several published peer-reviewed articles, the project generated national and international interest at conferences like the Institute of Food Technologists (IFT) and the American Oil Chemists' Society (AOCS). It also secured follow-up funding from USDA for related projects, including micronutrient delivery and sorghum protein-based biomedical applications.

The Sorghum Checkoff's investment in this research reflects its broader mission to support high-impact innovation that adds value for sorghum producers. As global interest grows in alternative proteins and sustainable ingredients, sorghum's unique attributes make it a natural fit for future-focused food systems.

To learn more about how Sorghum Checkoff research is unlocking new uses for U.S. sorghum, visit *sorghumcheckoff.com.*



Paden Johnson/ U of A System Division of Agriculture Ali Ubeyitogullari, left, an assistant professor of food engineering with the Food Science and Biological and Agricultural Engineering departments, and Sorour Barekat, a postdoctoral fellow in the Food Science Department, developed a new 3D "bioink" from sorghum proteins.

Sorghum Checkoff Announces First-Ever Human Clinical Trial on Whole Grain Sorghum's Health Benefits

The United Sorghum Checkoff Program (USCP) recently announced the launch of the first human clinical trial to evaluate whole grain sorghum's health benefits. Conducted by the University of Nebraska–Lincoln and co-funded by USCP in partnership with USDA's Agriculture and Food Research Initiative (AFRI) Commodity Board program, this landmark study will investigate how daily consumption of two whole-grain sorghum varieties — a traditional white sorghum and a phenolic-rich "sumac" sorghum — influences key health markers such as insulin resistance, inflammation and gut microbiome composition.

The trial is designed as a randomized crossover study in adults with obesity. Throughout the study, researchers will measure changes in insulin resistance, as well as secondary outcomes like body weight and composition, blood pressure, blood lipids, antioxidant and inflammatory biomarkers, and gut microbiota profiles.

"This first-of-its-kind human study is a direct result of sorghum producers' commitment to scientific research," said Lanier Dabruzzi, MS, RD, LD, Director of Nutrition & Food Innovation of the Sorghum Checkoff. "For years, we've seen promising evidence of sorghum's health benefits in vitro and in animal studies, and now we are taking the critical next step of exploring these and other benefits within the complexity of the human body. By investing in rigorous clinical research, we aim to provide the science-backed evidence health professionals and food companies need to recognize sorghum as a truly beneficial grain for whole-body health."

Tim Lust, CEO of the Sorghum Checkoff, noted that the study's implications extend from the field to the consumer marketplace. "Sorghum farmers have always known this crop is special, and now we're proving it on the biggest stage – human nutrition," Lust said. "This groundbreaking trial is not just a research milestone; it's laying the groundwork for sorghum's future. The data will be crucial as we pursue qualified health claims for sorghum with the FDA and collaborate with food companies on new sorghum-based products that deliver on nutrition and sustainability. It's an investment that we believe will pay dividends in the form of greater demand and value for our growers."

Looking ahead, the findings from this study are expected to pave the way for subsequent research to further explore sorghum's role in human health and to serve as a roadmap for food companies to innovate for sorghum-based products.

For more information about the USCP and other research projects please visit *SorghumCheckoff.com.*

Forage Sorghum Momentum: What Producers Should Know

Forage sorghum, especially in the form of silage, is gaining serious ground among producers in drought-prone areas looking for a water-efficient alternative to corn. The United Sorghum Checkoff Program is actively educating farmers, supporting research and capturing assessments on sorghum silage acres to better serve the growing demand.

Forage sorghum brings several key advantages to the table:

Versatility: Hybrids are available to meet both forage and starch needs.

Water efficiency: Sorghum uses 36% less water than other grains.

Yield stability: It performs well even under dry, tough conditions.

Disease resistance: Sorghum is naturally resistant to tar spot and corn stunt disease.

Cost advantage: Sorghum seed typically costs less per acre than corn.

Recent innovations in kernel processing have improved starch digestibility to as much as 65 to 70 percent. New male-sterile hybrids eliminate the need for kernel processing altogether by storing energy as water-soluble carbohydrates. Research from Texas A&M shows that replacing a percentage of corn silage with sorghum silage can increase energy-corrected milk yield in dairy operations.

Since 2022, the Sorghum Checkoff has supported extensive research through partnerships with institutions like Texas A&M, Cornell, Purdue, Iowa State and the University of Florida. Projects have focused on nitrogen optimization, seeding rates, protein enhancement and performance trials in both dairy and beef cattle systems.

To keep the momentum going, the checkoff is investing in outreach to inform dairies and livestock producers of sorghum's value. Educational efforts include field days, extension materials and producer resources focused on building rations, hybrid selection, agronomy and feed performance.

As producers seek cost-effective, resilient feed solutions, forage sorghum stands out as a smart choice. The Sorghum Checkoff remains committed to supporting the adoption of forage sorghum through education, research and market development.

For tools, updates and forage resources, visit *sorghumcheckoff.com*.

New Recipes Highlight Sorghum's Versatility and Global Appeal

The Sorghum Checkoff continues to elevate sorghum's profile as a premium ingredient by investing in new recipes and photograpghy that showcase its versatility, nutrition and conservation benefits. These recipes, designed for both consumers and foodservice professionals, will be featured across social media and paid campaigns to build demand and shared value for sorghum growers.

In addition, a new recipe series, World of Sorghum, taps into trending global flavors while celebrating sorghum's heritage as an ancient grain. Developed by Chase Obenchain, Sorghum Checkoff Corporate Chef, these internationally inspired recipes reflect sorghum's culinary relevance across cultures and its role in modern, sustainable cooking. Keep an eye out for these exciting new tools to help share sorghum's story. Explore the recipes and share the story of sorghum at *sorghumcheckoff.com.*

Strawberry Crumble Bars

Summer Peach, Tomato and Sorghum Salad

SORGHUM INDUSTRY EVENTS

September 21-23	**Export Sorghum**	*San Antonio, Texas*
October 14-16	**Sunbelt Ag Expo**	*Moultrie, Georgia*
October 19-22	**Global Ethanol Summit**	*Washington, DC*

For more events, visit sorghumcheckoff.com/news-and-events/

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USCP MISSION

The Sorghum Checkoff commits to reveal the potential and versatility of sorghum through increased shared value.

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