



UNIVERSITY OF MISSOURI EXTENSION

# Osage County

# 2024 Annual Report

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**Extension**  
*University of Missouri*

an equal opportunity/ADA institution

**SERVE  
MISSOURI.**

**DELIVER  
MIZZOU.**



Office of Extension  
and Engagement  
*University of Missouri*

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108 Whitten Hall  
Columbia, MO 65211  
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December 2024

Dear county commissioners, elected leaders and friends of MU Extension and Engagement,

As we reflect on the past year, I want to express my deep gratitude for your support of MU Extension and for your partnership in enhancing the lives of Missourians.

Your support for MU Extension fuels Missouri's agriculture, strengthens families, prepares our youth and promotes the health, well-being and vitality of our communities. Over the past year, our programs have focused on addressing key needs throughout the state:

- **Expanding access to 4-H:** To make 4-H more accessible, we've introduced more in-school and after-school clubs, reducing barriers and creating opportunities for young Missourians to develop essential skills and leadership abilities.
- **Supporting agriculture and land stewardship:** We're addressing critical issues such as succession planning for family farms, rural mental health, agricultural business management and land stewardship. These initiatives are helping Missouri's farmers plan for the future and preserve the health of our land for future generations.
- **Advancing health initiatives:** Our team of community health field specialists, covering every region of the state, works directly with local leaders to assess health needs and bring UM System resources and expertise to these communities, supporting healthier lives and stronger communities.
- **Promoting economic development:** MU Extension is helping to create economic opportunities by working with individuals, supporting businesses in their growth and collaborating with communities to enhance local vibrancy. Through these efforts, we help bring new jobs, skills and possibilities to Missourians across the state.
- **Providing essential training:** Our continuing education programs prepare Missouri's firefighters and health care workers to meet the demands of their roles with the latest skills and knowledge, ensuring they are well-prepared to serve our communities.

As you read through this annual report, I hope you feel as proud as I do of the accomplishments we've achieved together. The dedication and professionalism of MU Extension's faculty and staff are inspiring, and I am grateful to work alongside them—and each of you—as we make Missouri a stronger, healthier and more vibrant place. Thank you for your continued support and partnership. Together, we are serving Missouri by delivering the University *for* Missouri.

Warm regards,

Chad Higgins, PhD  
Vice Chancellor, MU Extension and Engagement  
Chief Engagement Officer, UM System

# Who we are

## Faculty & Staff Serving Osage County

Matthew Herring  
East Central Regional Director

Elizabeth Anderson  
Extension and Engagement Specialist

Kathy Dothage  
Extension Professor

Vacant  
Youth Program Associate

Beth Nolte  
Office Support

Rudra Baral  
Field Specialist in Agronomy

Chrisee Brandl  
Field Specialist in Livestock

Gatlin Bunton  
Director, Wurdack Extension & Education Center

Katherine Deeken  
Field Specialist in Nutrition and Health

Dhruba Dhakal  
Field Specialist in Horticulture

Sean Eberle  
Field Specialist in 4-H Youth Development

Christina Edholm  
Field Specialist in Human Development

Charles Ellis  
Field Specialist in Agricultural Engineering

Rusty Lee  
Field Specialist in Agronomy

Billy McCaslin  
Forestry Management Educator

Dawn Sebion  
Nutrition Program Associate

Mary Sobba  
Field Specialist in Ag Business

## Extension Council Members

Sharon Jeffroy, Chair  
Danielle Tilly, Vice Chair  
Karen Thompson, Treasurer  
Lyle Best, Secretary

Luke Deeken  
Ellen Kliethermes  
Amy Niederhelm  
Scott Schulte – MFA  
Darryl Griffin – Commissioner

The Osage County Extension Council meets on the 3rd Tuesday of the month at 6:30 p.m.



## Osage County Commissioners

Darryl Griffin  
Presiding Commissioner

John Trenshaw  
Eastern District Commissioner

Larry Kliethermes  
Western District Commissioner

## Budget and more

### Appropriations budget

#### Income

County Appropriations	42,000
<b>Total Income</b>	<b>42,000</b>

#### Expenses

Salaries/Benefits	25,861
Travel	2,318
Postage	580
Advertising	418
Office Supplies/Service	5,803
Equipment Lease	1,201
Insurance	2,525
Capital Repairs	403
<b>Total Expenses</b>	<b>41,931</b>



## Keep up with MU Extension in Osage County!

Follow us on Facebook!



Check out our website:  
<https://extension.missouri.edu/counties/osage>

### MU Extension is a unique funding partnership.

Extension funding is a three-way partnership of federal, state and county government. Federal and state money, through the University of Missouri system, pay professional staff salaries, training costs, computers and communication equipment. County funds support the local office, secretarial and youth assistant salaries, staff mileage and council expenses.

The Osage County Extension Council, faculty and staff would like to express our appreciation to Osage County Commissioners for their continued support of extension programs.



### Local Support

Did you know you can donate directly to Osage County Extension with a gift to be used immediately or as an endowment contribution for long term efforts. Monies put into the endowment are left forever to earn interest with the county office benefiting each year. You can also direct your donation to a specific program such as 4-H or Master Gardeners.

# Osage County



## UM System Footprint in the county in 2024



### FY24 county students

**113 students**

- 89 Undergraduates
- 24 Graduate and professional students
- 89 Full-time students
- 24 Part-time students
- 14 Pell grant recipients (aid year 2024)



### County employees and retirees

**218 people employed by UM**

- 32 Campuses
- 184 MU Health Care (includes additional employees gained via the recent integration of Capital Region Medical Center)
- 2 UM System

11 UM retirees and beneficiaries

UM salary and retirement income: \$10.3 million

UM state tax revenue: \$320,386

UM federal tax revenue: \$1.7 million



### County alumni

**Selected school alumni**

- 4 Medicine
- 27 Nursing
- 47 Health Professions
- 3 Dentistry
- 4 Pharmacy
- 10 Veterinary Medicine
- 120 Agriculture
- 89 Engineering
- 11 Law

**Alumni teaching K-12**

- 20 teachers
- 14.4% of all district teachers



### County breakdown

**MU**

- 85 students
- 403 alumni
- 31 employees

**UMKC**

- 5 students
- 14 alumni
- 0 employees

**Missouri S&T**

- 21 students
- 75 alumni
- 1 employee

**UMSL**

- 2 students
- 23 alumni
- 0 employees



County population: 13,379



### County services provided

**Health care (FY24)**

- 5,941 in-state patients seen at MU Health Care, with \$1.1 million of uncompensated care
- 1 in-state patient seen at UMSL Center for Eye Care with a statewide average of \$32.18 per patient in uncompensated care
- MU Health Care's Missouri Telehealth Network recorded 1,836 visits to 1,055 patients having ZIP codes associated with the county

**Extension (2023)**

- 934 Total educational contacts from MU Extension to residents of the county, including:
  - 159 contacts related to productive farming, better gardening, and managing natural resources
  - 701 contacts related to healthy eating and aging, strengthening families, personal finance, or youth development
- 47 contacts related to starting businesses, developing community leaders, or renewing the local economy



### Construction projects

- \$19,530 remitted to 2 county vendors, for 2 projects



### County properties and offices

MU Extension in: Osage County

# Osage County



# University of Missouri System

COLUMBIA | KANSAS CITY | ROLLA | ST. LOUIS

## UM System Statewide Footprint

### Economic and Community Development Highlights

- In FY23, Business Development Specialists worked with small businesses and entrepreneurs statewide to create or retain 98,527 jobs.



For every dollar invested from 2019 to 2021, the MU Extension Business Development Program has returned \$133 in economic impact for its clients by increasing sales more than \$1.6 billion. For a total impact of \$3.1 billion, the program has generated more than 37,000 jobs and attracted nearly \$451 million in capital investments and \$1.5 billion in government contracts.

- Between FY18 and FY23, UM System brought Missouri more than \$1.58 billion in federal and private research funds, funded primarily from outside the state, but spent within the state.



In FY24, UM System was issued 29 patents and filed 69 new U.S. patent applications.

- In FY24, the UM System awarded 707 design and construction project contracts throughout Missouri, for a total investment of \$287.3 million in the state.



In FY24, to improve access to medical and health related services, MU Health Care's Missouri Telehealth Network's Show-Me ECHO program provided 16,687 hrs of case-based instruction to 3,113 learners located in 105 of 114 Missouri counties and the city of St. Louis.

### Education and Training Provided



40,542 police, fire fighters, and medical professionals attending continuing education (2023)



Agriculture and natural resource programs served 369,077 farmers and related businesses (2023)

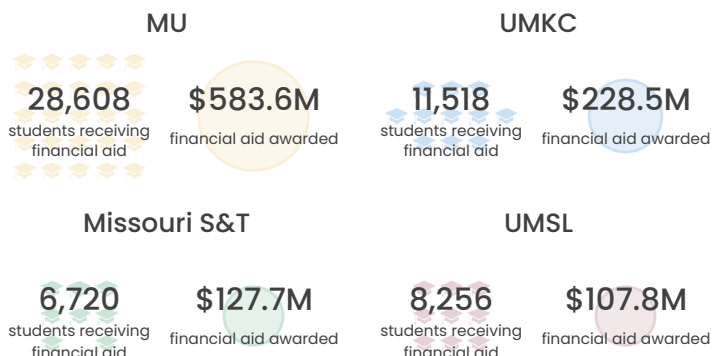


210,577 youth and stakeholder educational contacts in 4-H clubs, schools, camps and other programs (2023)

### Education Highlights

#### FY24 Financial Aid Awards

In FY24, 69.7% of the UM System's 79,014 students received financial aid totaling \$1.048 billion



UM System's MOREnet (Missouri Research and Education Network) provides internet connectivity, access, support and training to 58 higher education institutions (230,000 students), 484 K-12 school districts (830,000 students) and 134 public libraries (serving nearly 3 million Missourians) in 2023.

- UM System awarded 50.5% of the 31,689 Bachelor's or higher degrees awarded by Missouri four-year public institutions in 2023-24.
- UM System awarded 35.0% of the 1,776 research doctorates and 26.8% of the 3,796 professional doctorates awarded by Missouri public and not-for-profit private institutions in 2023-24.
- In FY24, UM System's \$30.7 million in National Science Foundation (NSF) grants represented 96.9% of all NSF grants made to Missouri public colleges and universities.
- In 2024, over 12,400 Missourians accessed mobroadband.org, part of the UM System Broadband Initiative which helped the statewide build-out of high-speed internet infrastructure.

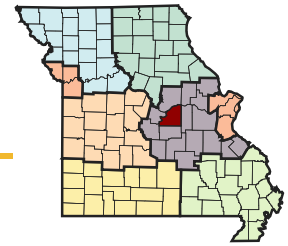
Supporting the University of Missouri is an investment in the future of Missouri.

The university advances Missouri citizens and communities through its mission of teaching, research, public service, and economic development across our four campuses and University of Missouri Extension.

Prepared in December 2024, based on the best available and most recent data. Data Sources include: Missouri Office of Administration • UM IR • MU Institute for Public Policy • Center for Applied Research and Engagement Systems (CARES) • MU • UMKC • Missouri S&T • UMSL • UM System • UM Health Care • MU Extension • US Census Bureau • US Dept. of Health and Human Services • National Science Foundation



# Missouri Grand Challenges: Local Solutions



OSAGE COUNTY

## Knowing Missouri's Needs

MU Extension asked Missourians to share the greatest challenges they and their communities face.

We heard that feedback and made big changes in the way we work with council and local partners to improve lives. Locally, a network of county engagement and subject matter specialists now share MU's knowledge, research and engagement, targeting programs, information and assistance in:

- agriculture and environment
- youth and family
- business and community
- health and safety

**For each grand challenge, MU Extension and Engagement targets a specific gain by 2023:**



### Economic opportunity

Increase MU Extension and Engagement's economic impact to the State of Missouri from \$1 billion to \$1.5 billion overall, and from \$88 billion to \$100 billion in agriculture, the top economic sector



### Educational access and excellence

Increase participation in postsecondary education from 66% to 70%



### Health and well-being

Improve Missouri's health ranking from 40th to 35th in the nation

## Knowing Local Challenges



### CHALLENGE 1: Economic Opportunity: *Economic Mobility*

### Average Earnings per Job

Average earnings per job can reflect the type of economy, skill of employees, and availability of jobs and workers in an area. Average earnings is calculated by dividing total full-time and part-time employment by total earnings. Earnings is the sum of three components of personal income--wages and salaries, supplements to wages and salaries, and proprietors' income. Full-time and part-time jobs are counted at equal weight. Both employment for wages and salaries and proprietors employment are included, but the employment of unpaid family workers and volunteers is not included. Average earnings per job is a measure of the wages paid at jobs in the county not the earnings of people who live in the county. The dollar figures shown are not adjusted for inflation.

#### 2022 Average Earnings (\$)

\$42,793

Osage



Missouri

\$62,528 🙄

Data Source: US Department of Commerce, [US Bureau of Economic Analysis Regional Economic Accounts](#). 2007-2022.

### Cost-Burdened Households (30%)

Cost-burdened households, where housing costs exceed 30% of total annual household income, is one measure of the relationship between cost of living and income. Households with high housing costs have fewer dollars remaining for other expenditures and are more likely to live paycheck-to-paycheck. The 14.54% of households in the report area are considered cost-burdened. This is below the state average of 25.15%.

#### Cost-Burdened Households, Percent

14.54%

Osage

Missouri

25.15%

Data Source: US Census Bureau, [American Community Survey](#). 2018-22.

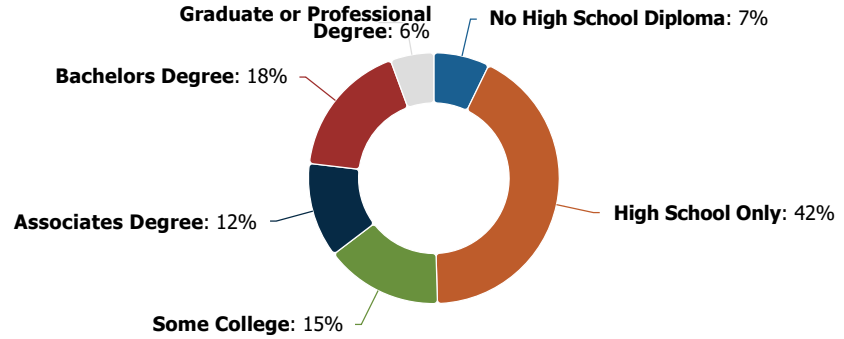


## CHALLENGE 2: Educational Access and Excellence: *Educational Attainment*

### Adult Educational Attainment

Educational attainment shows the distribution of the highest level of education achieved in the report area, and helps schools and businesses understand the needs of adults, whether it be workforce training or the ability to develop science, technology, engineering, and mathematics opportunities. Educational attainment is calculated for persons over 25 and is an estimated average for the period from 2017 to 2021.

In the report area, 15.1% of adults have at least some college education and 29.7% of adults have an associate's level degree or higher. However, 42.3% stopped their formal educational attainment after completing high school, and 7.2% of adults did not complete high school.



#### No High School Diploma

7.24%

Missouri 8.69%

Osage

Data Source: US Census Bureau, [American Community Survey](#). 2018-22.

Data Source: US Census Bureau, [American Community Survey](#). 2018-22.



## CHALLENGE 3: Healthy Futures: *Healthy Aging*

### Fall Injuries

Falls are the leading cause of injury-related fatality and hospitalization among older adults in the United States. Between 2013 and 2015, adults over age 65 in the report area had 335 hospital or emergency room admissions for fall and jump-related injuries. The rate of these injuries was 4,585 per 100,000 population, which is lower than the state rate of 5,396. Falls hospitalizations have improved since the 2001-03 time period when the rate was 4,667.

### Primary Care Providers

Older adults make up a historically large percentage of the U.S. population, and meeting the healthcare needs of an aging population can be challenging. In the report area, there are approximately 3 primary care physicians (MDs and DOs) to serve the area's 2,394 residents over the age of 65. The patient-provider ratio in the report area is 798:1, which means there is 1 provider for every 798 older adults. The ratio of adults to providers in the report area is higher than the state average of 250:1, which means there are fewer providers per person in this area.

#### Rate per 100,000, 2019-2021

4,585

Missouri 5,396 😞

Osage



Data Source: US Department of Health & Human Services, [Missouri Department of Health & Senior Services](#). 2019-2021.

#### Rate per 100,000 Seniors

125.30

Missouri 399.40

Osage

Data Source: US Department of Health & Human Services, Health Resources and Services Administration, [HRSA - Area Health Resource File](#). 2021.





## CHALLENGE 4: Agricultural Growth & Stewardship: *Soils Testing*

Recent public initiatives and USDA programs are putting a focus on producers to improve the health of their soil. The USDA-NRCS defines soil health as the continued capacity of the soil to function as a vital, living ecosystem that sustains plants, animals and humans. A variety of practices can improve soil health, including regular monitoring, sampling and testing protocols. The MU Soil and Plant Testing Laboratory provides testing and unbiased, research-based recommendations for economically viable and environmentally safe nutrient management practices across Missouri.

Report Area	Agriculture	Home and Garden	Community Areas	Research	Total
Osage	386	35	10	0	431
Missouri	13,742	4,773	421	6,406	25,342

Data Source: [University of Missouri Extension Soil and Plant Testing Laboratory Annual Summary](#). 2022.



# MU EXTENSION **Serves MISSOURI and Delivers MIZZOU** through credible statewide programs

## Missouri 4-H for ages 8 – 18



**Community clubs** are organized by volunteer club leaders and teams of recognized volunteers. Members attend club meetings, elect officers, enroll in projects and plan learning and community service activities. Some clubs opt to be single-project clubs, where all members focus on the same project.



### **Missouri 4-H Agriculture and STEM programs**

employ hands-on activities that foster problem-solving, creativity, critical thinking and exploration in engineering and technology. Agriculture programming emphasizes biology, environmental science, agri-science, veterinary science and engaging activities such as animal care and agronomy. STEM programs delve into computer science, robotics, aerospace, physics, chemistry and veterinary science.



**4-H Natural Resources programs** employ hands-on activities in climate science, environmental sustainability, renewable energy, sportfishing and wildlife conservation. The **Shooting Sports program**, which teaches marksmanship, safe firearm use, hunting and archery principles, is a prime illustration of how 4-H programs promote holistic youth development and responsible citizenship. Supported by caring adult leaders, these programs offer opportunities to cultivate life skills, self-worth and conservation ethics.



### Legend



Agricultural Growth & Stewardship



Economic Opportunity



Educational Access & Excellence



Health & Well-Being

# Osage County

Missouri 4-H

## Local Impact



Osage County 4-H is both committed to community service, left, and to recognizing our wonderful volunteers, right. Our ten community clubs and many volunteers make this program special.

Osage County 4-H hosts A “Kids Morning Out” the Friday morning of the Osage County Fair.

Local agencies and vendors provide activities and giveaways for local families with young children.



# Osage County

Missouri 4-H

## Profiles and Stories



Check out some of our Exhibit building projects from the Osage County Fair!

### Profiles and Stories

A community of 169 Club members and 429 participants building life skills, contributing to their community, and becoming college and career ready.

#### **Common Measures**

Findings from a 2021-22 evaluation study shows that Missouri 4-H:

#### ***Missouri 4-H Inspires Kids to Do***

98% said they are willing to work hard on something difficult.

91% set personal goals.

97% said they try to learn from their mistakes.

98% said they treat others the way they want to be treated.

#### ***Missouri 4-H Grows True Leaders***

97% said they like to learn about people who are different from them.

93% said they think about others feelings before they say something.

75% reported feeling comfortable being a leader.

#### ***4-H Builds Leadership and Communication Skills***

95% help others reach their goals.

86% comfortable speaking in a group.

99% said they show respect for other's ideas.

85% Can work with someone who made them upset.

95% Look for ways to involve all members of a group.

#### ***4-H Builds Social and Emotional Skills***

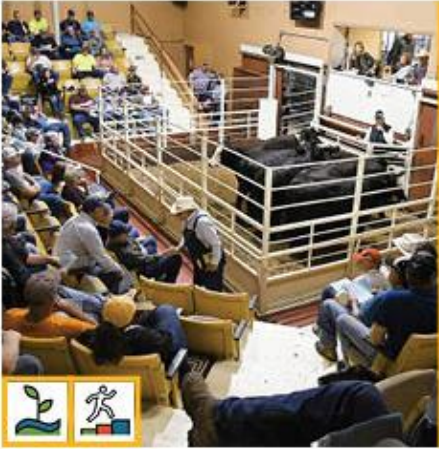
94% said they keep trying until they reach their goals.

89% Stop to think about their choices when making a decision.

97% reported that they like to learn new things.



# MU EXTENSION **Serves MISSOURI and Delivers MIZZOU** through credible statewide programs **Agriculture and Environment**

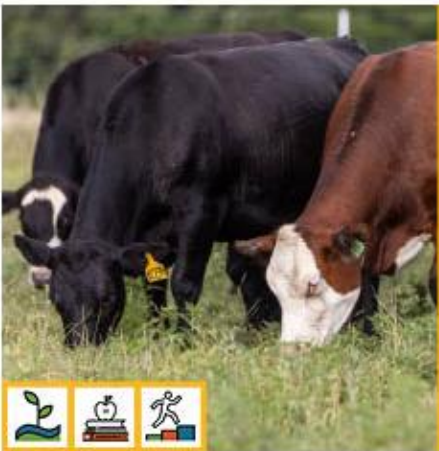


## **The Missouri Show-Me-Select Replacement Heifer Program**

strives to enhance beef herd reproductive efficiency, boost farm income and establish dependable sources of quality replacement cows in Missouri. The program brings in the power of animal genomics through an enhanced DNA-option, Show-Me-PLUS.



Since its inception more than **900 FARMS** have enrolled, with an estimated statewide impact of **\$200 MILLION.**



**Missouri Grazing Schools** teach management-intensive grazing by dividing large fields into smaller paddocks and systematically rotating livestock among them. Producers who attend the grazing schools learn how to reduce costs through improved livestock grazing and pasture management while getting insights into fencing, watering systems and grazing system design.

The annual impact of management-intensive grazing is estimated to be **\$125 MILLION** per year in Missouri.



**The Missouri Integrated Pest Management Program (IPM)**, funded by USDA grants, has been an important extension program for more than 30 years. Mizzou IPM distributes articles, pest monitoring data and publications on how to improve the application of integrated pest management strategies and systems in crops. In addition, the new Soybean Growth Monitoring Report is released through IPM every two weeks during the growing season.

The MU Soil Testing Program delivers research-based nutrient and lime recommendations to more than **32,500** customers annually.

## Legend



Agricultural Growth & Stewardship



Economic Opportunity



Educational Access & Excellence



Health & Well-Being

# Osage County

Chrisee Brandl – Livestock Specialist

Agriculture and Environment

## Local Impact

**Pixels and Pearls of Production** – This is a hands-on educational opportunity for women in agriculture. The Pixels session was held via Zoom on topics including estate planning, backyard layers, enhancing value added meat marketing, and beekeeping. The keynote presentation was given by a Professor at the University of Arkansas, Janeal Yancey, who writes about the meat industry from the view as a mom and producer. The Pearls session was held in person at MU Beef Research and Teaching Farm in Columbia, MO. Topics included genetics, forage and pasture, backyard layers, and farm headaches. Youth were able to participate in the Pearls session by interacting hands-on with Missouri agriculture products. They made their own lunch and gained knowledge about the agriculture industry. The program for 2024 had approximately 61 participants.



### **Show-Me-Select (SMS) Heifer Replacement Program** –

The SMS program showed increased adoption rate by farmers in Missouri of management practices that offer potential to improve long term reproductive efficiency of their herds resulting in profitability. The 2024 SMS sale for the Central Region was held in Vienna, MO. Chrisee Brandl is the Regional Coordinator for the Central Region. Chrisee completed 12 farm visits to gather pre-breeding, breeding, pregnancy data along with tagging heifers before the sale. There were 7 consignors that sold 43 heifers at the sale. The sale average was \$3,036. Heifers that were bred artificial insemination averaged \$3,173 and heifers that were bred natural service averaged \$2,946.

**Grassland Partnership** – This partnership is an USDA-NRCS funded program being led by the University of Tennessee and Extension service partners across nine states, including MU Extension. The partnership invited producers with grazing livestock to enroll in the program and implement specific grasslands management practices on their farms. These practices are known to improve grasslands productivity and provide environmental benefits including greenhouse gas reductions, that may offer an alternative source of income through developing carbon and environmental benefit markets. Chrisee Brandl is an agent for this partnership. Chrisee enrolled one producer that will implement native warm season grasses, amending soil with biochar, and planting legumes. This is a five-year project. Chrisee and Rusty Lee offered an event for producers to learn more about the program prior to enrollment closing. 11 participants attended the event.



Chrisee Brandl presented on the topic of extending the grazing season for livestock producers at various events. She reached approximately 725 youth and 50 producers on this topic.

# Osage County

Dhruba Dhakal - Horticulture Specialist

Agriculture and Environment

## Local Impact

### Workshop on Tomato Production in Home Garden – Osage County

This workshop provided education to the gardeners and horticulture crop producers about the importance of tomato among the gardeners in Missouri. They learned about the nutritional and medical importance. In the workshop, the participants learned about the suitable environment, soil preparation, seedling transplanting, nutrient, water, insect-pest and disease management. They also learned about physiological problems, harvesting and post-harvest handling of tomato in this workshop. There were 16 participants in the 2-hour workshop.



**Picture 1. Participants attended the workshop on tomato production in home garden in Osage County Library, Linn, MO.**



# Ag Business

Covering Franklin, Gasconade, Osage, Maries, Miller, Pulaski, Phelps, Dent, Crawford, Washington, St. Francois and Ste. Genevieve Counties

Rachel Hopkins  
Ag Business Specialist  
573-438-2671  
[hopkinsrm@umsystem.edu](mailto:hopkinsrm@umsystem.edu)



## 2024 AT A GLANCE

- **757** direct contacts in Beef Production Systems.
- **42** Lenders attended 'What Lenders Need to Know in 2025' in Jefferson City. Lenders heard from presenters discussing Market Outlooks, Policy Updates, MASBDA and Farmland Values and Rental Rates.
- **115** attendees at the Farm Tax Workshops held in December, both in-person and online. Rachel presented on Conservation Tax Implications for this workshop.
- **97** mid-Missouri farmers and ranchers attended the Central Missouri Forage & Beef Conference in Maries County.
- **22** local producers attended the Wurdack Producer Field Day in October to hear about local applicable topics.
- **6** attendees at the Succession Planning in Ste. Genevieve
- **66** producers attended three Grazing Schools where Financial Aspects of Grazing were taught.



The cannulated bovine is always a memorable time with the FFA students.

## 1678 DIRECT CONTACTS 3447 INDIRECT CONTACTS



Producer Field Day at Wurdack is a great way to reach local producers. The topic this year was the financial aspects of Native Grass.

## KEY SUCCESSES

- ✓ **Monthly emails** out to subscribers letting them know of upcoming Extension programs in the region.
- ✓ Presented at the **Missouri Livestock Symposium** on the Beef Feeding Profitability Tool, G462.
- ✓ **Rural Safety Day** educates 3<sup>rd</sup> graders in Washington County of hazards they might encounter and thus preventing traumatic injuries.
- ✓ **Tax Workshops** educate participants on timely tax issues and how they can better manage tax liability.
- ✓ **Wurdack FFA Day** provides a learning opportunity for 9<sup>th</sup> graders on different fields in agriculture and exposes them to new ideas and concepts.

# Osage County

Mary Sobba – Ag Business Specialist

Agriculture and Environment

## Local Impact

### Agriculture Lender Seminar

One hundred nine lenders from 30 Missouri counties and Illinois attended ag lender seminars in Mexico and Jefferson City. Lenders learned about crop and livestock outlook, agriculture policy, rental rates & land values, MU budgets, wind and solar leasing, input costs and enterprise budgets, Missouri farm business management summary and Missouri Agricultural and Small Business Development Authority (MASBDA) programs.

By attending University of Missouri's Agricultural Lenders' seminars, lenders gain knowledge to help their clients make better decisions based on objective education and resources. More information and better decisions benefit their portfolio of producers, landowners, and agribusinesses through enhanced understanding of enterprise budgets, market expectations, and other decision influencing factors affecting families' and businesses' financial health.

(Osage had 3 participants)





## RUDRA BARAL, AGRONOMY SPECIALIST

**Serving Counties:** Cole, Miller, Pulaski, Maries, Osage and Gasconade County

### 2024 Annual Report

This report summarizes the accomplishments and contributions made by me in 2024 to support agricultural producers and community members of Cole, Miller, Pulaski, Osage, Maries and Gasconade County.

#### Educate

- Conducted 7 **Private Pesticide Applicator Training** sessions across Gasconade, Miller, Pulaski, Maries, Osage, and Cole counties, trained 189 individuals in the safe and effective use of restricted-use pesticides.
- Delivered in-person workshops on **Understanding Your Soil Needs** in Miller County and trained 10 producers on soil texture, plant nutrients, soil pH, soil sampling methods and soil test result interpretation
- Offered free **Nitrate Toxicity Testing** for 37 hay producers and educated them about nitrate poisoning, its causes, and prevention strategies to ensure safe livestock feed.
- Assisted 12 producers for **Hay Quality Test** with lab result interpretation.
- Reviewed 652 **Soil Sample Reports** from multiple counties and provided personalized recommendations to improve soil fertility and productivity.
- Hosted educational programs such as **Smart Pasture Management for Horses** and **Spring Pasture Management**, disseminated through radio interviews, newsletters, and in-person training which reached over 10000 community people in Miller, Pulaski and Maries Counties.
- Attended the **Government Day Program** in Maries County, introduced more than 30 high school students about services and agricultural programs offering by MU Extension.

#### Create

In 2024, I created following educational materials and scholarly articles

1. Wagle, P., Shayeghi, A., Bhattarai, N., Northup, B. K., Moffet, C., Gunter, S., & **Baral, R.** (2024). Evapotranspiration in Rainfed and Irrigated Alfalfa in the US Southern Great Plains. *AGU24*.
2. **Baral, R.**, Kim, J., Rice, C. W., & Min, D. (2024). Evaluating Agronomic Factors Affecting Forage Yield and Nutritive Value of Winter Wheat. In *ASA, CSSA, SSSA International Annual Meeting*.
3. Guareschi, C.A., Mendes, A.C., Massigoge, I., **Baral, R.**, Helguera, M.P.G., Cominelli, S., Peraza, J., Simão, L.M., Widanagamage, N., Denson, E. & Parajuli, S. (2024). The Effect of Crop Intensification and Diversification on Soil Health Under Rainfed Wheat-Based Cropping Systems. In *ASA, CSSA, SSSA International Annual Meeting*.
4. Yang, S., Mahmood, M., **Baral, R.**, Wu, H., Almloff, M., Stanton, L.E., Min, D., Smiley, B.K., Iiams, J.C., Yu, J. & Im, J. (2024). Forage conservation is a neglected nitrous oxide source. *PNAS nexus*, 3(9), Pp373.
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9. Created newspaper article on "How to Remove Lily Pads from Ponds".
10. Created article on "**Nitrate Poisoning in Forages**" published in August 2024 newsletter of Missouri Cattlemen's Association.
11. Created article on "**Soil Sampling Techniques-A frequently Asked Questions**"
12. Created article on "**Improved Pasture Management for Horse**" published in local newspaper in Maries County and broadcasted at local FM (KFBD 97.9) in Pulaski County.
13. Developed a comprehensive training manual on "**Alternative Summer Forage for Missouri Producers**".
14. Developed a comprehensive training manual on "**Understanding Your Soil Needs** to support soil health education.

## Connect

- Engaged with local farmers and producers through over 40 **farm visits** and numerous phone consultations to provide technical assistance on soil health, pasture management, and weed identification.
- Participated in **county council meetings** and annual dinner events across Miller, Cole, Pulaski, Osage, Maries, and Gasconade counties to share program updates and gather community input.
- Actively engaged in **Grassland Partnership Program** and worked closely with Professors, Extension professional and producers of several states to promote sustainable pasture and forage management.
- Served as Coordinator for the **Lake Area Master Garden Program** and engaged in implementation of Master gardening program activities in Miller and Camden County.
- Served as Secretary for Miller and Pulaski County Soil and Water Conservation District board and actively engaged in decision making process to promote soil and water conservation practices.
- Established connections with numerous researchers, educators, and extension specialists in the fields of agronomy, crop science, and soil science nationwide, through active membership in the **American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, and the University of Missouri Extension Association.**

## Professional Development

- Attended several high-impact training programs. Some key trainings including:
  - State Grazing School – Train the Trainer Program
  - Commercial Remote Pilot Training
  - Trulaske Digital Marketing Workshop



- Agricultural Drone Utilization Training
- Private Pesticide Applicator Training for trainer
- Soybean Management Strategy organized by Science for Success
- Generative AI for Extension Professional
- 2024 Crop Management Conference
- Participated in the **Agronomy, Crop, and Soil Science Society of America International Annual Meeting** in San Antonio, presenting a poster on **Cropping Potential of Forage Soybean in Midwest Rainfed Systems**.

**2025 Proposed Program**

SN	Program/Event	County	Objective	Target group
January	Logistics and Resource Management	Miller	Create training manuals and forms for the training events	Farmers and landowners
February	Understanding Your Soil Needs Workshop	Osage, Maries, Pulaski	Educate participants on soil texture, plant nutrients, soil pH, soil testing and result interpretation	Farmers, gardeners, and landowners
March	Understanding Your Soil Needs Workshop	Cole, Gasconade	Educate participants on soil texture, plant nutrients, soil pH, soil testing and result interpretation	Farmers, gardeners, and landowners
	Warm Season Pasture Management Training	Miller, Pulaski, Maries	Teach summer pasture management including pasture weed management	Livestock producers
	Private Pesticide Applicator Training	Cole	Certify producers for safe and effective pesticide application	Agricultural producers
April	Private Pesticide Applicator Training	Maries, Pulaski	Certify producers for safe and effective pesticide application	Agricultural producers
	Warm Season Pasture Management Training	Miller, Cole, Gasconade, Osage	Teach summer pasture management including pasture weed management	Livestock producers
May	Private Pesticide Applicator Training	Cole, Gasconade, Miller, Maries	Certify producers for safe and effective pesticide application	Agricultural producers



<b>June</b>	Pasture Walk	All counties as per request	Field visit, problem identification and provide technical assistance for improved pasture management	Livestock producers
<b>July</b>	Cool-Season Pasture Management	Miller, Cole, Gasconade	Teach cool season pasture management including extending grazing	Livestock producers
<b>August</b>	Cool-Season Pasture Management	Pulaski, Maries, Osage	Teach cool season pasture management including extending grazing	Livestock producers
<b>September</b>	Hay Quality Testing Workshop	Miller, Osage, Maries	Explain the importance of hay quality, hay quality testing and result interpretation and nitrate testing	Livestock producers
<b>October</b>	Hay Quality Testing Workshop	Miller, Osage, Maries	Explain the importance of hay quality, hay quality testing and result interpretation and nitrate testing	Livestock producers
<b>November</b>	Understanding Your Soil Needs Training	Miller	Educate participants on soil texture, plant nutrients, soil pH, soil testing and result interpretation	Farmers, gardeners, and landowners
	Alternative Summer Forages for Missouri	All counties	Explore alternative summer forages suitable for Missouri climate that are drought resilient and offer high yield and excellent nutritive value	Livestock producers
<b>December</b>	Alternative Summer Forages for Missouri	All counties	Explore alternative summer forages suitable for Missouri climate that are drought resilient and offer high yield and excellent nutritive value	Livestock producers
	Private Pesticide Applicator Training	Cole	Certify producers for safe and effective pesticide application	Agricultural producers



# MU EXTENSION **Serves MISSOURI and Delivers MIZZOU** through credible statewide programs **Business and Community**

## AMERICA'S SBDC MISSOURI CLIENT HIGHLIGHT



LOCS  
- OF -  
GLORY

The **Missouri Small Business Development Centers** (SBDC) provide professional training and customized one-on-one counseling to small businesses across the state. Working with the Missouri SBDC helps business owners make confident decisions.

**FY2020-2022, Missouri SBDC ASSISTED 878 STARTUPS and helped Missouri small businesses earn more than \$440 MILLION.**



### DEMOGRAPHIC, ECONOMIC AND WORKFORCE DATA TRAINING

**MU Exceed** offers customized data training. Participants learn how to use public data through hands-on exercises and demonstrations.

**In 2022, Exceed provided data training to MORE THAN 200 MISSOURIANS. 95% of the attendees said that the information they learned was useful to their work.**



**Neighborhood Leadership Fellows** is an advanced leadership program centered on driving systemic change. Twenty-six residents of North St. Louis City and part of North St. Louis County, graduated from the program in 2022. Fellows gained advocacy skills that enable them to take on civic leadership roles and influence policymaking. Key program outputs include a 10-year personal leadership plan by each fellow and group projects aimed at fostering more equitable regional policies for their neighborhoods.

**In the most recent St. Louis election cycle (April 4, 2023), 11 NEIGHBORHOOD LEADERSHIP FELLOWS alumni ran for office, and SEVEN OF THEM WON their elections. In that group, individuals were elected to serve as mayors, school board members and city council representatives.**

## Legend



Agricultural Growth & Stewardship



Economic Opportunity



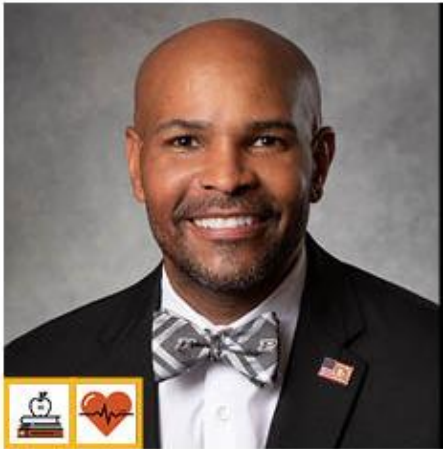
Educational Access & Excellence



Health & Well-Being



# MU EXTENSION **Serves MISSOURI and Delivers MIZZOU** through credible statewide programs **Community and Professional Health Education**



The **Show-Me Resilience** project focuses on strengthening resilience across Missouri. As part of this initiative, the Community Health Engagement and Outreach program hosted the Rural Resilience Lecture Series in 2024, highlighting how building resilience can reduce substance misuse and substance use disorders. The series concluded with a keynote from Dr. Jerome Adams, former U.S. Surgeon General, on fostering resilience in rural communities.

**In the past two years, 274 people attended the lecture series. Among participants, 93% reported that the information was applicable to their daily work and useful.**



The **Diabetes Prevention Program** is recognized as "Full Plus," the highest status given by the CDC and is provided by licensed lifestyle coaches to prevent type 2 diabetes. Through lifestyle changes participants can achieve sustainable weight loss, increase in physical activity and learn coping skills to manage stress.

**More than 1 IN 3 PARTICIPANTS  
have reached the  
5 - 7% WEIGHT LOSS GOAL.**



**PROSPER** is a research-supported approach that promotes positive youth development and strong families through lifeskills education that increase protective factors and reduces risky behaviors among teens. Through a campus-community partnership, PROSPER Teams are created to support the implementation of two evidence-based programs with middle school students and their families.

**"They have the old saying it takes a village to raise a child, the more the community comes together the better off the children are going to be in that community."**

**Peggy Saphian PROSPER Model Participant in Fredericktown, MO**

## Legend



Agricultural Growth  
& Stewardship



Economic  
Opportunity



Educational  
Access &  
Excellence



Health  
& Well-Being





MU EXTENSION **Serves MISSOURI and Delivers MIZZOU**  
 through credible statewide programs  
**Continuing Education**



The **Fire Service Leadership Enhancement Program** (FSLEP) prepares fire and emergency service leaders for the opportunities and challenges they will face. For 22 years, the MU Fire and Rescue Training Institute has partnered with the Missouri Association of Fire Chiefs and the Missouri Association of Fire Protection Districts on this program.



The LETI **School Protection Officer Program** provides basic training for school faculty and administrators to become school protection officers. The three-week academy typically runs during June and exceeds the hourly requirements for state recognition and certification.



The **Aircraft Rescue and Fire Fighting** (ARFF) program provides specialized fire training for Federal Aviation Administration (FAA) certificated airports. The program uses a Mobile Aircraft Fire Training simulator to provide realistic on-site fire and rescue training at airports. The program supports commercial service airports, which are required to provide recurring ARFF training for their airport firefighters.

**Legend**



Agricultural Growth & Stewardship



Economic Opportunity



Educational Access & Excellence



Health & Well-Being



# MU EXTENSION **Serves MISSOURI and Delivers MIZZOU** through credible statewide programs **Health and Human Sciences**



**Mental Health First Aid** equips people to recognize and respond to signs of mental illness and substance use challenges.

Youth Mental Health First Aid is primarily designed for adults who regularly interact with young people (ages 12-17) facing mental health or addition challenges while the adult version focuses on adults aged 18 and older. Participants learn how to offer initial assistance and guide individuals toward the care they need.

**In Missouri, approximately 1 MILLION ADULTS and 72,000 ADOLESCENTS suffer from MENTAL HEALTH ISSUES.\***

\*Missouri Department of Mental Health 2020 Status Report



### **Building Strong Families**

Studies show that people with strong family bonds tend to have lower stress levels. Building Strong Families helps families deal with disagreements, manage stress and show their love for one another.



**Policy, systems, and environmental** (PSE) changes encourage residents to improve community health by making healthy choices easier and more accessible. Residents design strategies around local needs, assets, and interests.

**HELPING HANDS FOOD PANTRY** leaders decided pantry clients needed access to healthier foods. Review of food procurement and display practices led to a new policy allocating **\$1,000** of pantry discretionary spending for **LOW-FAT DAIRY OR FRESH PRODUCE.**

## Legend



Agricultural Growth & Stewardship



Economic Opportunity



Educational Access & Excellence



Health & Well-Being

# Osage County

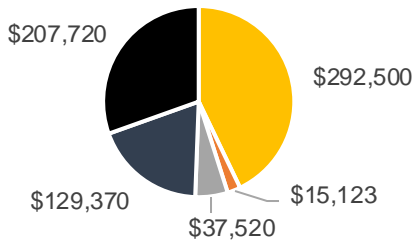
## Health and Human Sciences

### Local Impact

In 2024, a single Building Strong Families session helped a father reconnect with his teenage son after months of conflict. This is just one of the 3,257 lives impacted across Missouri through programs addressing mental health, youth resilience, and family communication, generating an economic impact of over \$682,232. From Saline County youth learning resilience at summer camp to Boone County families strengthening self-esteem, these programs create lasting positive change in Missouri communities. By fostering mental wellness, strengthening families, and empowering youth, these programs create long-term benefits for Missouri communities. Continued support ensures these efforts grow, transforming even more lives in the year ahead.

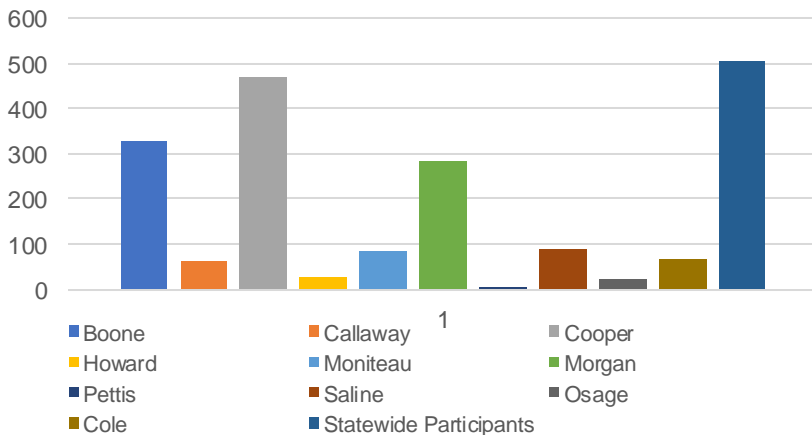


### Economic Impact by Program 2024



- Building Strong Families
- Matter of Balance
- Ouch! That Stereotype Hurts
- Childcare
- MHFA (Mental Health First Aid)

### Participants By County 2024



# 58%

of ag community members accessing teletherapy in 2024 were from Boone, Cooper, Howard, Moniteau, and Morgan counties. Free One-On-One Counseling Build coping skills with confidential counseling from a trusted source who knows ag.

**573-882-4677**



**Congratulations to Kathy Dothage  
2024 Educator of the Year**

# Osage County

## Health and Human Sciences

### Profiles and Stories

#### Supporting Families Through Education: Building Strong Families

Tina Edholm delivered the **Building Strong Families** program to **564 participants** statewide, focusing on improving parenting skills. A memorable activity used paper dolls to explore how life experiences, such as bullying or neglect, can harm a child's self-esteem. Participants brainstormed ways to repair self-esteem, such as giving praise and setting achievable goals, symbolized by taping the doll back together.

"This program taught me how to communicate with my teenage son. For the first time in months, we had a calm and meaningful conversation. – *anonymous Building Strong Families Howard County 2024*



*"I didn't know I had so many good things about me. This activity made me feel proud of myself."*  
-third-grader YMCA, Kids and Self-Esteem 2024

#### Empowering Youth Through Resilience

Across Missouri, **713 youth** developed leadership and life skills through programs like Heit's Point Summer Camp and YMCA activities. A camp counselor noted, *"The kids learned how to work together and express their emotions constructively. It's amazing to see their growth."* These programs not only teach valuable skills but also foster resilience and teamwork, preparing youth for future success.



#### Promoting Mental Wellness

By equipping 190 participants with skills to recognize and respond to mental health crises, **Mental Health First Aid (MHFA)** strengthened workplaces and community support systems across Missouri. One participant shared, *"This training gave me the confidence to help someone in need."* These efforts created a ripple effect of resilience and well-being, with an estimated economic impact of **\$32,300**, fostering healthier, more connected communities.

"This training gave me the tools to support a colleague during a mental health emergency. I feel more confident in my ability to help."  
– anonymous MHFA participant, Callaway County, 2024



## A MATTER OF BALANCE

MANAGING CONCERNS ABOUT FALLS

*"I didn't realize how much fear of falling was holding me back. Now, I feel ready to enjoy activities I used to avoid."*

- anonymous participant, MOB 2024

For older adults, maintaining independence is life-changing. Through A Matter of Balance, participants gained practical tools to reduce fall risks, build strength, and improve confidence. This program not only enhances quality of life but also generates an estimated economic impact of **\$37,520** by reducing fall-related medical costs

# Osage County

## Health and Human Sciences

### Local Impact

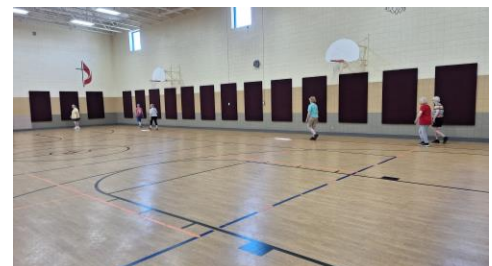
#### Tai Chi

In Osage County, about 30.86% of households have adults who are 65 or older. It's vital for older adults to stay active to keep their health strong, stay independent, and avoid falls. Kathy Deeken offered a Tai Chi class in Osage County. This class helped 10 older adults learn the Tai Chi forms to build strength, balance, and confidence. Kathy also taught ways to lower the risk of falls and make everyday activities easier, supporting those adults' ability to maintain independence in their own homes.



#### Walk With Ease

Kathy offered a Walk With Ease class in Osage County. Walk With Ease gave 8 participants the opportunity to make exercise a part of their daily lives. This class helped 8 older adults increase their balance, reduce the pain of arthritis, increase their strength and walking pace, and build confidence in their ability to be physically active, leading to improved overall health. For those in Walk with Ease, 87% walked longer, and 69% improved balance. A few of the participants have continued to meet to walk, and a few of these participants later signed up for Tai Chi.



# Osage County

## Health and Human Sciences

### Profiles and Stories

#### Tai Chi



One participant stated he could already tell a positive difference in his balance. Another stated she didn't think she would be able to "do it," but is glad she stayed. One participant who participated in both classes stated that "for the first time," she was able to vacuum her whole house without having to stop before finishing due to pain or fatigue.

#### Walk With Ease

Five Osage County Walk With Ease participants later joined a second program. One participant stated that "she learned a lot." Another talked about really "liking the stretching. We're going to keep it up.". Other participants said "this has helped me a lot." "I can tell a difference. It's remarkable." A total of 17 registered for the Walk With Ease classes offered in 2024. 8 of 17 reported increasing their walking by at least one day per week. 10 of 13 reported walking at least 3 times per week for at least 30 minutes by the end of the program. 12 of 17 participants increased their walking duration by at least 5 minutes.



#### Increasing Our Presence

Multiple Extension professionals increased Extension's presence in Osage County through manning a booth at A Taste of Osage. Kathy participated in this event as a way to learn more about the community and its needs, and to educate residents about programs we offer. She also manned a booth at Chamois Day.



# Osage County

## Health and Human Sciences

### Profiles and Stories

The Supplemental Nutrition Assistance Program Education (SNAP-Education or SNAP-Ed) brought \$11,145,237 in federal funds to Missouri. The funds support engagement with 74,864 Supplemental Nutrition Assistance Program (SNAP) recipients and eligible citizens of Missouri who learned about being active and healthy eating on a budget. This year we had 1,164,143 indirect educational contacts through newsletters, health fairs, food pantries, and the Show Me Nutrition helpline.

Participants in SNAP-Ed learn the importance of making healthier meals and snack choices, eating breakfast more often, are more willing to try new foods, increase their physical activity, and make healthier food choices. Those who practice healthy eating and are physically active are more likely to contribute to a healthy labor force and enjoy a high quality of life throughout the lifespan.

This vital programming effort also reduces healthcare costs over the participant's lifetime, saving taxpayer money in reduced public healthcare benefits and insurance premiums.

#### One of several success stories thanks to Dawn's hard work and dedication:

In a school setting and I asked the children in the combined 1st and 2nd grade class if anyone tried something new over the break and this little girl told me she did.

On my last visit with this class a little girl told me she tried Star fruit over Thanksgiving break, and she was the one that asked her parents if they could try it. She said it is because I asked them to try something new on the break and let me know. I asked if she liked it, she said yes did and will keep trying new things.

#### Local Impact:

**26,376 direct and indirect contacts were made in Osage County**

**"These Fruit coolers are so good, and the bike is so cool"**



Smoothie Bike at the Special Olympics Summer 2024