



*Working together to
solve problems*



University of Missouri Extension

2014 ANNUAL REPORT

A MESSAGE FROM THE VICE PROVOST



Michael D. Ouart, vice provost and director

On May 8 of this past year, state extension organizations observed a centennial of service in our nation's capital. MU Extension marked the occasion with a theme of "Celebrating the Past, Building for the Future." Though the celebrations have come to an end, extension's focus on building for the future persists.

The University of Missouri remains strongly committed to the land-grant mission of practical education for all. One needs only look at the breadth of MU Extension programming to understand that our programs and services today are a reflection of the state's residents, their interests and their needs.

More than 2.3 million Missourians from all 114 counties turned to MU Extension this past year. MU Extension honors its mission of bringing relevant, reliable and responsive education to improve lives and local economies.

Professionals in business, public safety, health, government, labor, education and agriculture routinely turn to extension for research-based, non-biased information and assistance. Extension's 4-H youth program reached more than 290,000 young people ages 5 to 18 in every corner of the state. The Osher Lifelong Learning Institute helped senior citizens improve their lives through classes and seminars, and extension's website continues to be an invaluable asset in reaching Missourians in all corners of the state.

It can be difficult at times to satisfy growing demand for information and services with limited funding, but teams of extension faculty and staff from across the state are exploring innovative approaches to programming and funding that will allow extension to flourish in the next 100 years of service.

In early 2014, R. Bowen Loftin was named chancellor of the university. Understanding the value of dialogue, MU Extension has introduced Chancellor Loftin to extension programs through a series of tours, during which he met with participants and key stakeholders from all corners of the state. These tour events, which will continue into 2015, are designed to foster connections with communities that lead to stronger local extension efforts across the state.






This year's annual report highlights our work in five thematic areas, which represent the individual and societal challenges of the 21st century. Reading through this report will give you a sense of how MU Extension is helping transform lives, businesses and communities all over Missouri.

Thank you for supporting MU Extension, and we look forward to our continuing relationship with you and our partners across the state as we build for the future.

A handwritten signature in black ink, appearing to read "M. D. Ouart".

Michael D. Ouart

Contents

<i>Message from the vice provost</i>	2
 <i>Health systems</i>	4
 <i>Community, workforce, economic and business development</i>	7
 <i>Global food systems</i>	10
 <i>Environmental concerns</i>	13
 <i>Educational attainment</i>	16
<i>Partners</i>	20
<i>Statistical data</i>	22
<i>Program summaries</i>	24
<i>Celebrating the Past, Building for the Future</i>	26

On the cover

Front:

On May 6, 2014, the University of Missouri and the Columbia Chamber of Commerce celebrated the opening of the **Family Impact Center**. The Family Impact Center provides lifelong education to improve the quality of life of individuals in the Columbia community and houses University of Missouri Extension programs in areas such as nutrition, fitness and financial planning, among others, to best address unmet needs.

Back (left):

Seth Ritter of Lexington learned how to print posters on letterpress printers at MU Extension's Summers @ Mizzou arts camp in Columbia. Ritter has been a participant in the Lexington Community Arts Pilot Project in Lexington, Mo. **The Community Arts Program** engages students, faculty and local citizens in creating vibrant communities that support a thriving economy through the arts. The program builds on existing community assets, connects to public issues, includes broad participation and partner perspectives, and develops effective youth and adult leadership through education and training.

Back (right):

Brent Myers, a professor and MU Extension plant pathology specialist, speaks during the **2014 Field Days**. Field days give farmers insight into ongoing research that can help them address emerging pest problems, respond to and recover from droughts and floods, and learn about the latest in technology that can help improve their operations.



Boots on the Green helps veterans with disabilities

After Bobby Hutchinson lost his left leg in 1991 during Operation Desert Storm, he thought he would never play golf again.

"I just kind of had it in my head that chapter in my life was over," said Hutchinson, who was a heavy equipment operator in the U.S. Navy Construction Battalion when his leg was crushed in an accident in Saudi Arabia.

He heard about Boots on the Green, a partnership between University of Missouri Extension, the St. Louis Veterans Affairs Medical Center, Gateway PGA and H.E.R.O.E.S. Care, a support network for military families.

"I was like, 'You've got to be kidding me! I'm going to be able to golf?'" Hutchinson said.

For the past five years, Boots on the Green has helped veterans with disabilities enjoy the therapeutic benefits of golf.

"Golf is a great medium for therapeutic recreation because it uses all the facets. You have your mental, your physical and your social facets in golf," said Jerry Hitzhusen, an MU Extension associate professor of parks, recreation and tourism. "And there are benefits to just being outdoors on a golf course rather than at the VA hospital, where most of these men reside."

Hitzhusen, who works with VA recreation therapists, PGA golf professionals and volunteers to organize golf clinics and tournaments for the program, has been involved with therapeutic recreation for more than 40 years. In 1971, he started the Midwest Symposium on Therapeutic Recreation, which has become a model for professional training and continuing education in the field.



▲ **Jerry Hitzhusen, MU Extension associate professor of parks, recreation and tourism, works with veteran and golfer Bobby Hutchinson as part of the Boots on the Green program.**

Hitzhusen said certain features of golf make it particularly suitable for therapeutic recreation. It's a challenging sport, but it doesn't require extended periods of physical exertion. The nature of the game encourages socializing, and the handicapping system lets golfers with different abilities or skill levels play one another competitively.

Advances in assistive technology have made golf courses accessible to players with limited mobility. Hutchinson is able to play golf in large part due to special single-rider golf carts, which a growing number of courses make available to disabled golfers. They are designed to allow golfers to drive onto tee boxes and putting greens without damaging the turf. The golfer can raise, lower

and pivot the seat to address the ball without dismounting.

Veterans also benefit from personalized attention from golf pros and avid golfers like Hitzhusen, whom Hutchinson credits with improving his swing.

"Boots on the Green has been a godsend," said Gary York, an Army veteran who returned unscathed from the Vietnam War but as a civilian lost his legs in a railroad accident.

Since getting involved in the program, York has become a mentor and inspiration to other disabled veterans. "I meet guys that say, 'Oh, I can't do this. I'm handicapped.' You can play golf. If I can play golf, you can play golf. They find that out once they get out here. That's the greatest thing."

***"If I can play golf, you can play golf. They find that out once they get out here. That's the greatest thing."
– Gary York***

MU Nursing Outreach (MUNO) worked with 2,833 nurses and other health care providers through continuing education programs. MUNO serves a predominantly rural audience with 88 percent of the Missouri participants residing outside the metropolitan St. Louis and Kansas City areas. In addition to Missouri nurses, nurses from 22 other states benefited from MUNO's educational programs.

Children learn to ‘Eat Smart’ at child care

Children in child care are learning more than just shapes and colors these days. Now they learn how to eat smart.

At 48 child care centers across the state, children are learning healthy eating habits through the Eat Smart program. In partnership with the Missouri Department of Health and Senior Services, University of Missouri Extension provides nutrition and health specialists to help child care centers meet the Missouri Eat Smart Guidelines.

Nearly a third of children ages 2 to 5 are overweight or obese, according to Robin Gammon, at the time an MU Extension nutrition and health specialist. According to the national Centers for Disease Control and Prevention, childhood obesity has doubled in the past 30 years.

By the time children reach kindergarten, they have already developed eating habits that can carry into adulthood, so it's important to influence eating habits early, Gammon said.

Since 2010, MU Extension nutrition and health specialists have been working on the Eat Smart program to help child care centers make snacks and meals more nutritious. They also conduct nutrition workshops for the staff and teach them how to incorporate nutrition education into lesson plans.

“Thousands of kids are eating healthier food and developing healthier habits because of the program.”

– Robin Gammon

“Thousands of kids are eating healthier food and developing healthier habits because of the program,” Gammon said. She added that it takes an average of 18 months for child care centers to move from processed, fried and canned foods to made-from-scratch foods, fresh fruits and vegetables. Gradually, children become interested in trying new foods such as broccoli or cauliflower once they see their fellow classmates and teachers enjoying the food.

Gammon called it the “herd effect” and she



hopes that students will then influence their parents and other family members to eat healthier by asking for foods they have tried at day care.

Shelley Gifford, director of Little Einstein's Learning Center in Blue Springs, said she had child development training but didn't have a background in nutrition, so she was grateful for the coaching and hands-on technical training from MU staff.

With patience and persistence, teachers at Little Einstein have helped children make better choices. Gifford has incorporated food discussions into everyday learning activities, such as planning and growing a garden at the center.

MU Extension nutrition specialist Susan Mills-Gray said meals are served family style, with children serving themselves at the table from common platters, so they control what and how much they eat. They also learn manners and social skills by helping set the table and clearing dishes when the meal is finished.

Outside food is not allowed at Eat Smart centers, so cupcakes, cookies and cakes are not permitted. “We don't always have to celebrate with cake, cookies or candy,” Gray said.

The Eat Well Be Well with Diabetes program helped Missourians with diabetes learn strategies and habits to improve their quality of life through programs delivered across the state. Participants learned about changing their diet to keep blood sugar levels in check, monitoring blood sugar levels, making healthier food choices and preparing healthy meals.

The Health Insurance Education Initiative (HIEI) delivered 230 workshops reaching over 3,000 Missourians through face-to-face programming. HIEI's media efforts — through TV, radio, newsprint, public service announcements and website hits — reached approximately 400,000 Missourians.

Stay Strong, Stay Healthy uses exercise to improve participants' quality of life

Adults with developmental disabilities exercised their bodies and social skills through weekly strength-training sessions at the University of Missouri Extension Center in Callaway County.

Extension nutrition specialist Lynda Zimmerman adapted MU Extension's popular Stay Strong, Stay Healthy program to meet the needs of Callaway County residents who are developmentally disabled. She said she hopes that the program will be used statewide.

Stay Strong, Stay Healthy focuses on improving the health and well-being of middle-aged and older adults through a safe, structured and effective strength-training program. The 10-week program was modeled after a similar program developed by researchers at the Friedman School of Nutrition Science at Tufts University.

Julia Kaufmann, executive director of Callaway County Special Services, contacted Zimmerman after learning about a successful Stay Strong, Stay Healthy class. She thought the participants of Callaway County Special Services' adult day program would benefit. Zimmerman agreed, but said she thought the program needed to be adapted to meet the needs of this group.

According to a 2010 report from the federal Centers for Disease Control and Prevention, more than half of adults with disabilities engage in no leisure-time physical activities.

"Everybody needs exercise, and everybody benefits from this Stay Strong, Stay Healthy program," Zimmerman said.

Zimmerman said the class helps participants strengthen muscles and improve balance. More importantly, it provides opportunities for social interaction.

"Many of these individuals have problems with their balance, so I'm conscious of that and try to work in exercises that are going to help stabilize them," Zimmerman said.

Kaufmann said that participants look forward to the weekly sessions and have noticeably better attitudes and self-esteem after attending class.

"I have seen such tremendous growth in these



individuals," Kaufmann said. "I have seen how they truly love to be here. They come in very excited."

Zimmerman maintained an environment of positive reinforcement and encouraged participants after each exercise.

"Teaching this class has been very rewarding for me personally; to see the growth of these individuals," Zimmerman said.

In FY 2014, the program reached more than 600 people with disabilities who are over the age of 50 to help them reverse the ill effects of a sedentary lifestyle.

"The partnership between MU Extension and Callaway County Special Services Adult Enrichment program is very valuable," Kaufmann said. "I was pleased to see the program is research-based and offers a quality level of programming. This

kind of program is important because it broadens the scope of what is offered to them. We are always looking for opportunities."

"I was pleased to see the program is research-based and offers a quality level of programming. This kind of program is important because it broadens the scope of what is offered to them."
– Julia Kaufmann

▲ ***MU Extension nutrition specialist Lynda Zimmerman coaches Randal Schraer, a participant in an adaptive fitness program for developmentally disabled adults in Callaway County. The 10-week program promoted exercise and social skills to help participants improve their well-being and overall quality of life.***

Veterinary Medical Extension and Continuing Education (VMECE) team members presented information about improving livestock production or minimizing animal disease at 31 meetings across the state, reaching more than 1,500 producers.



MU Extension helps West Plains army veteran expand enterprise

Many military veterans have the background and inclination to pursue entrepreneurship. Floyd Henson of West Plains, Mo., is a good example. A U.S. Army veteran who served in Korea, Japan and Vietnam, Henson learned many things during his tours of duty that benefited him when he became a business owner.

“My army experience taught me the value of honesty, integrity and discipline,” Henson said. “When I became a business owner, I applied the management skills I developed as a helicopter crew chief. Planning and thorough preparation are key.”

According to recent U.S. Small Business Administration studies, veterans “are at least 45 percent more likely than those with no active-duty military experience to be self-employed.” The organization, motivation and discipline required to succeed in the military are similar to traits necessary to succeed as a business owner.

His company — Henson Enterprises Inc. — focuses on manufacturing precision-machined industrial parts for producers such as Caterpillar, Regal-Beloit and DRS Technologies. Much of the work Henson Enterprises performs is conducted through contracts with government agencies. Henson decided to pursue his first government contract a couple years after starting the firm in 2003. To improve his chances of winning his first contract, he turned to an old friend and former coworker.

That old friend, Willis Mushrush, is a specialist with University of Missouri Extension’s Business Development Program (BDP). Among his many areas of expertise, Mushrush helps businesses traverse the maze of government contracting rules at the BDP’s Missouri Procurement Technical Assistance Center.

“When Floyd wanted to apply for a government contract, I helped him follow government regulations

and complete the elaborate paperwork he needed to pursue those contracts,” Mushrush said.

As business progressed, Henson eventually determined he needed to expand his company. He had the opportunity to buy sophisticated manufacturing equipment at a bargain price from his former employer. To do that, he needed a loan.

Once again, Mushrush assisted by applying business development expertise derived from another BDP program, the Missouri Small Business and Technology Development Centers.

“We put together a detailed business plan, which Floyd used to secure business expansion money from four funding sources,” Mushrush explained.

The loans allowed Henson to expand his plant, buy additional manufacturing equipment and create more jobs at his company. The 10-year-old firm has grown from 600 square feet to 25,000 square feet, and its original workforce of two employees has grown to 18 skilled workers.

“These jobs have made a significant impact on the economy in West Plains,” Mushrush said. “They aren’t just minimum-wage jobs. They are highly paid manufacturing positions that demand specialized training and experience.”



The **Business Development Program (BDP)** helped clients start **227 new businesses**, create or retain **9,005 jobs**, increase sales by more than **\$224 million** and acquire more than **\$166 million** in new financing.

In FY 2014, the **Labor Education Program** offered **33 courses** and conferences to meet the needs of **773 participants**. A major focus of Labor Education programming in FY 2014 involved studying the pressures imposed on economic security through significant changes in employee retirement and health benefit plans.

◀ **Floyd Henson, left, owner of Henson Enterprises, and Willis Mushrush, MU Extension business development specialist, examine one of the precision parts Henson’s company produces for government and private business applications.**

MU Extension specialist helps Hannibal business develop new attractions

Many small businesses depend on tourism dollars, and Mark Twain Cave in northeastern Missouri is no exception. It was the inspiration for the fictional cavern in Twain's "The Adventures of Tom Sawyer."

In 2009, Linda Coleberd was the new owner and general manager of Mark Twain Cave Complex. It had been in the family for generations, but the longtime special education teacher faced unfamiliar challenges as a new business owner. The economy had stalled and tourism had fallen off. She knew she needed guidance and turned to University of Missouri Extension for help.

For the past five years Coleberd has worked with Charles Holland, MU Extension business development specialist, starting with an introductory small-business course. Extension's Business Development Program helps business owners like Coleberd through counseling and education to improve or grow their business. This year, the program has helped increase sales statewide by more than \$224 million.

"The MU Extension program gave me a lot of background in business and gave me a lot of new ideas I've incorporated today out here," she said.

There are only so many times you can trek through a cave. Coleberd knew the seasonal nature of the cave's appeal to tourists. She wanted to expand and diversify her business, but was reluctant to take chances and make changes.

"Charles Holland encouraged me to think outside the box and get out on a limb," Coleberd said.

Over several counseling sessions, Holland offered several ideas to broaden Coleberd's business model. She opened a winery, teamed with a local dairy to produce and sell cave-aged cheese, and included branded products in the gift shop



▲ **Linda Coleberd, owner and general manager of the Mark Twain Cave Complex, turned to MU Extension for help with diversifying her business. Coleberd's business now boasts a winery and partners with a local dairy to produce cave-aged cheese.**

to promote the business and increase revenue. Coleberd attributes most of the 10 percent increase in sales to her work with the MU Extension business development program.

"You have to be a risk-taker if you want your business to grow, and University of Missouri Extension was my teacher, my professor, to help me think outside the box," Coleberd said. "I would never have done that without the encouragement of MU Extension."

Last year, Missouri's tourism industry generated \$14.6 billion in total economic impact and \$1.2 billion in local and state taxes, according to a 2013 Missouri tourism division report.

"You have to be a risk-taker if you want your business to grow, and University of Missouri Extension was my teacher, my professor, to help me think outside the box."

– Linda Coleberd

As part of the **Pesticide Applicator Training program**, regional extension specialists conducted certification training for **3,650 private applicators**. More than **2,000 commercial applicators** received training through the **University of Missouri CPAT program**. Of the **2,068 participants**, **349 attended certification training** and **1,719 attended recertification training**. Applicators must undergo recertification training or retesting to retain a commercial pesticide applicator license. According to the U.S. Bureau of Labor statistics, the average annual salary for pesticide workers is \$31,690. At that average salary, the program has an estimated statewide economic impact of more than **\$65.5 million**.

Pilot Grove emerges from food desert with arrival of new grocery store

A grocery store is more than just a grocery store when your community hasn't had one in five years.

Pilot Grove residents greeted the arrival of Tyler's Market with enthusiasm last fall.

"It's heaven-sent for us, because at our age it's very difficult to get out and get groceries," said longtime Pilot Grove resident Pat Dill, 81.

The Cooper County town of more than 700 citizens saw its last grocery close in 2008, which left residents with lengthy trips to Boonville, Marshall or Sedalia to visit a grocery store. Though surrounded by farmland, Pilot Grove had become a food desert.

In 2010, town leaders formed a community betterment group to explore solutions. Connie Mefford, a University of Missouri Extension community development specialist, helped the group sift through ideas.

"We knew we had to do something to bring a grocery store to town," said local cattle rancher Robert Felten, one of the group's leaders. "We have a community, but when you don't have services, you don't have a community for very long."

Felten and other community leaders, backed by Mefford's research, eventually encouraged the group to focus on an "if we build it, they will come" solution.

In spring 2013, the community betterment group organized a limited liability company (LLC) comprising 36 individuals. Within 10 days, the LLC raised more than \$300,000 in capital to build a new grocery facility.

"Really, it was the whole town pulling together,"



▲ Dolores Stegner shops at Pilot Grove's new grocery store. Stegner is a member of the Pilot Grove Community Betterment Association, which enlisted MU Extension's help to bring a grocery store to Pilot Grove.

Mefford said. "People here care a lot about their community, and through the whole process I've seen people come through and offer to help out."

The community's sincerity attracted the interest of Cody and Paula Tyler, who ran successful small-town groceries in Knob Noster and Waverly. With construction capital and willing operators, concept quickly turned to reality. Pilot Grove shoppers were filling grocery carts at

Tyler's Market by November.

It's an economic benefit for the town, said Dolores Stegner, a member of the Pilot Grove Community Betterment Association. She gave a lot of credit to Mefford for helping the group pinpoint a solution.

"She did the research for us and she attended every meeting, giving us encouragement," Stegner said.

"We knew we had to do something to bring a grocery store to town. We have a community, but when you don't have services, you don't have a community for very long."
– Robert Felten

The Extension Community Economic and Entrepreneurial Development (ExCEED) program has helped communities identify measures that can be taken to improve their community's economic development. In FY 2014, the ExCEED program helped communities secure \$170,250 in funding from grants or other sources, start 125 new businesses, create or retain 1,672 jobs and secure more than \$55.7 million in business loans and investments.

As part of the **Community Arts Program**, Lexington residents have contributed **1,167 volunteer hours** and launched a fund for gifts and endowment to expand and sustain community arts programming — **all in the first year** of this pilot program. The city has benefited from an **improved public image**, launched two new art businesses, held seven art shows and is **developing an art gallery** in partnership with regional artists and a nine-county tourism alliance.



Farmers learn to make low-cost milk at Missouri dairy grazing conference

Keep it simple. Stay flexible. Cut costs. Milk producers heard those messages and more at this year's Dairy Grazing Conference.

Producers heard a new term this year, though: "Hybrid dairies."

Two years of drought redefined how milk is made. High grain prices hit conventional dairy farms hard, which forced many dairy operations to fold. Grazing dairies adopted the practice of feeding some grain to fill grazing gaps. Low-cost forages help graziers survive.

Tony Rickard, University of Missouri Extension dairy specialist, said, "We made it too complicated with too many forage varieties in the beginning." The first New Zealand dairymen who started dairy farms in Missouri said, "Just keep it simple."

U.S. graziers now use fewer forage types in their grazing paddocks and more cool-season grasses and warm-season species. Over time, New Zealanders adapted more U.S. forages.

A New Zealand speaker at the conference said Missouri can have four seasons in one day. "In New Zealand, we had winters of 30 degrees and summers in the 70s."

Missouri specialists reported what they learned in creating systems with cows, grass and economics. Then they took visitors to see their dairy grazing research at the MU Southwest Center in Mount Vernon, Mo.

Dave Baker, assistant dean for extension at the MU College of Agriculture, Food and Natural Resources, welcomed visitors with a speech emphasizing that Missouri is a forage state. "Grazing animals convert grass into farm profits."

In addition to Missourians, the conference drew international dairy producers from Ireland and New Zealand, and U.S. dairy farmers from Florida, Michigan and Texas.

Missouri retains an infrastructure for supporting dairy business, from trucking to manufacturing to artificial insemination suppliers.

Visitors noted that the state has local data from the research dairy herd at the nearby Southwest Center, where MU specialists help with planning



and analysis of farm results. Topics covered ranged from the importance of first-day nutrition for calves to matching calving to the grass-growing cycle and keeping the cow's rumen — her first stomach — functioning.

Farmers added advice as well. Eric Neill of Freeman, Mo., opened his talk with "Follow me around and do the opposite of what I do." He told of his risk management methods. In his first attempt, he protected his milk price on the futures market but didn't protect his feed prices. "Big mistake," he said.

Craig Zydenbos of Sarcoxie, Mo., added a small irrigation system to keep his grass growing in the dry months.

Brian Peterson of Trenton, Mo., told how grazing dairy attracted two sons to return to the farm. He had converted the family farm from conventional dairy into a grazing dairy. "That improved the economics," he added.

Grazing dairies can time their milking season to align with the grass-growing season, which allows shutting down milking for six weeks. Conventional dairies milk 365 days a year, morning and night. Grazing dairies reduce labor another way. There is less baling, storing and hauling of hay. Cows harvest most of their own feed, which cuts down on machinery costs.

MU Extension's Integrated Pest Management (IPM) Program held the annual Pest Management Field Day at the Bradford Research and Extension Center for agricultural retailers, technical service and research and development representatives from the agricultural pesticide industry, crop consultants, extension faculty, farmers and personnel from state and federal agencies. This year's conference saw approximately 150 attendees who make management decisions governing a total of more than 8 million acres throughout the Midwest.

School programs changing the way children view food choices

Two programs in Missouri schools are trying to change the way young people think about food and healthy food choices.

Fifth graders at Black Hawk Elementary School in Clark County learned how food gets from the farm to the table. University of Missouri Extension 4-H youth program assistant Katie Hogan, MU Extension nutrition associate Wendy Ray and teacher Rhonda LaCount taught students about how food gets from the farm to the table. The class connected students to a bygone era when families raised and produced their own food.

“Unfortunately we have a lot of kids, even in a rural area, who are removed from agriculture,” Hogan said. She added that many children today have little understanding of where their food comes from. “They may not have had the same experiences as their parents or grandparents.”

Hogan said she thinks it’s important to pass those experiences and traditions on through hands-on activities. She led them in a discussion of cows, milk and cream, and how butter is made. The hands-on activity involved a small amount of cream in condiment cups with lids at room temperature. Students shook the cream until it firmed, and then rinsed the buttermilk off the butter.

Wendy Ray visited classrooms throughout the year to talk about nutrition, show students how to read food labels and talk about how butter is healthier than margarine.

This is the third year of the program, which is held after end-of-the-year testing is done. “It’s great that we can bring the different aspects of extension together — science, agriculture, food and nutrition, and 4-H — in this project,” Hogan said.

Middle school students also get a

lesson in changing how their peers view food and food choices. A statewide contest challenged middle school students to create a poster, short video or catchy slogan promoting exercise and healthy eating.

The Missouri Council for Activity and Nutrition (MoCAN) and University of Missouri Extension sponsored the Youth Media Contest.

Donna Mehrle, an MU Extension nutrition and exercise physiology associate, said the contest was especially important because 31 percent of adolescent Missouri children are overweight or obese, according to the Missouri Foundation for Health.

“Through our work, we’ve seen that students really are motivated by other youth, and they have their own ideas about how to talk to their peers,” said Jon Stemmler, MoCAN chair and co-director of the MU Health Communication Research Center. “That’s why contests like

these are so important. Not only do they get the students excited, but they give the students a real voice too. When they design their own messages they’ll likely resonate with other youth as well.”

Jen Hadler, a middle school health and physical education teacher in Kirkwood School District, used the contest to give her class hands-on experience.

“My students are so excited to turn what they’ve learned about physical activity and nutrition into videos for this contest,” Hadler said. “I’m just as excited about showing the videos off to their classmates. Who better to learn from than their peers?”

“It’s great that we can bring the different aspects of extension together — science, agriculture, food and nutrition, and 4-H — in this project.”
– Katie Hogan

Extension swine nutrition programs worked with a group of independent Missouri pork producers whose sales account for more than 70 percent of the independently produced pigs marketed in Missouri and who purchase complete feed or raw ingredients for on-farm feed manufacturing. Independent pork producers account for more than 25 percent of Missouri’s total pig production. These pork producers purchase more than \$2 million worth of feed each year. By purchasing feed ingredients and other production inputs cooperatively, these independent swine producers save an estimated \$100,000 annually on purchased feed.

Seasonal and Simple is a free iPhone, iPad and Android app developed through University of Missouri Extension. The app guides you through **selecting, preparing and storing fresh fruits and vegetables** grown in Missouri. The app includes **recipes and nutrition information** for each of the fruits and vegetables that are listed. The application was created through a collaboration of MU faculty, staff and students from Human Environmental Sciences Extension, the Missouri School of Journalism and the College of Engineering.

Extension programs improve sale price, quality of beef cattle herds across state

MU Extension oversees two statewide programs that are having a major effect on the quality and value of cattle herds across the state.

Rebuilding a herd of beef cattle to capture record-setting prices means more than saving heifers to breed.

Dave Patterson, University of Missouri Extension beef specialist, said heifers need management and new breeding technology. Patterson, who developed the Show-Me-Select Replacement Heifer Program, said management and genetics add value to heifers. In managed care, more heifers become pregnant, producing live calves and staying in a herd longer.

The program also emphasizes reproductive goals aimed at improving breeding performance during the heifers' first breeding period.

Livestock operations are seeing the fruits of such labor. At a May 4, 2013, auction in Fruitland, Mo., the average per-head price for Show-Me-Select replacement heifers was \$1,822. At the same auction this year, beef herd owners paid a record average of \$2,644 per head — a nearly 50 percent increase over last year's average.

The top lot of four heifers sold for an average of \$3,200. All had superior genetics and management. Increasingly, top-selling lots are bred by artificial insemination, which Patterson says people are realizing more and more justifies the higher sale price.

"Quality and genetics on the heifers in this sale were the best we have had," said Roger Eakins, Show-Me-Select coordinator for southeastern Missouri. "Producers realize most risk has been eliminated and heifers add value to their herd."

The Show-Me-Select program has been so successful that other states are using it as a template for programs of their own.

"The system works," Patterson said. "There's no need to reinvent the wheel. Other states starting heifer programs base them on the Missouri Recipe."

Patterson also heads another program aimed at helping beef cattle herd owners add value to their herds: Quality Beef by the Numbers (QB).

QB seeks to expand technology adoption, reward industry adopters and increase supplies of high-quality beef. Technology that boosts value



▲ University of Missouri Chancellor R. Bowen Loftin and Michael Quart, vice provost and director of MU Extension, speak with Glen Birk about his work with the Show-Me-Select Replacement Heifer Program.

in heifers also adds value to genetically superior steers.

Where Show-Me-Select focuses on breeding in particular though, QB emphasizes a host of production practices and management techniques to increase the percentage of beef sold that reaches the two highest grades: choice and prime. The higher grade the beef, the higher the price for the farmer.

Prime-grade premiums remain the highest and most consistent bonuses paid. However, other premiums are gained as well. Quality-beef programs require more management, but that can result in less time and labor at breeding and calving times.

Implementation of the QB program expanded significantly in FY 2014 to 30 herds in three states with more than 14,000 cows.

"Quality and genetics on the heifers in this sale were the best we have had. Producers realize most risk has been eliminated and heifers add value to their herd."

– Roger Eakins

The Missouri Show-Me-Select Replacement Heifer Program recently created a Tier Two classification that distinguishes heifers from high-accuracy sires. Tier Two Show-Me-Select heifers carrying natural-service-sired pregnancies sold for an average of **\$125 more per heifer. Tier Two Show-Me-Select heifers carrying AI-sired pregnancies sold for an average **\$383 more per heifer**. Producers from **103** of Missouri's 114 counties have enrolled heifers in the program and sold **26,977 heifers**.**



Shrimp may be Missouri's next sustainable cash crop

Missouri agriculture typically brings to mind corn, soybeans and cattle, but research at the University of Missouri may make shrimp a cash crop in the Show-Me State.

David Brune, an MU Extension professor of food science, is developing a seafood production system that is sustainable, scalable and environmentally friendly.

At MU's Bradford Research Center, Brune is raising saltwater shrimp in a greenhouse. The facility holds about $\frac{1}{20}$ of an acre of water and is fully stocked with Pacific white shrimp.

Brune said shrimp is a valuable product that can be produced in a short period of time.

"I can grow a crop of shrimp here every 120 days," he said. "If I raise the equivalent of 25,000 pounds per acre of water and I can get \$4 a pound, that is a \$100,000 cash flow per acre of water every 120 days. That's not soybeans."

It costs Brune about \$3 a pound to produce the shrimp, so his shrimp will cost shoppers a bit more than typical supermarket shrimp for Missouri shrimp to be economically feasible. But Brune estimates many U.S. consumers would willingly pay a premium price for locally grown, higher-quality and sustainably produced shrimp.

"If 10 percent of American consumers would pay a premium price for shrimp, that is 120 million pounds a year," he said. "We're importing 1.2 billion pounds of shrimp from Asia. So if only one in 10 consumers would pay a dollar or two a pound extra, that is a \$100 million market right there."

Brune, who is also an MU Extension specialist, said modern seafood consumption is completely unsustainable. Expanding or even simply sustaining the seafood business will require aquaculture.

"We're overfishing the world's oceans in almost every species," he said. "Nearly all of the aquaculture that is being done internationally is itself unsustainable."

The system Brune has developed uses algae to control water quality by providing oxygen and removing carbon dioxide and ammonia. Excess algae can also be put to good use.

"You can't keep growing algae forever in a closed system, so we harvest the algae using brine shrimp," Brune said.

There are ultimately four byproducts of harvested algae: feed, fuel, methane and fertilizer. Brine shrimp mass can be used as a fish meal replacement to feed Pacific white shrimp. Brine shrimp waste can go into an anaerobic digester to produce methane to power the physical system, and effluent from the digester contains high levels of nitrogen and phosphorus, which can be used as fertilizer.

"We know that we can grow shrimp and provide seafood in a sustainable manner, in an environmentally compatible way, in a way that has zero discharge," Brune said. "That doesn't mean anything to anyone unless we do it cost effectively. So after I make this a technical success, I've got to make it so farmers can afford to do this and make a living at it. That is the final objective."



▲ *David Brune, an MU Extension professor of food science, shows shrimp raised in a sustainable saltwater system.*

The Missouri Master Naturalist Program is a chapter-based program developed and facilitated in partnership with the Missouri Department of Conservation. For 10 years, the Master Naturalist Program has offered local, community-based training for volunteers around the state.

- The Missouri Master Naturalist Program trained **161** new volunteers in FY 2014, for a total of **1,508** volunteers trained since 2004.
- Volunteers provided **53,000 hours** of community service during the past year with more than 100 local chapter partners. More than **260,000 hours** of community service have been conducted since 2004.
- The economic impact of Missouri Master Naturalist volunteer service during the past year is valued at **\$1,299,649**. The cumulative economic impact of Missouri Master Naturalist volunteer service since 2004 is valued at **\$5,154,583**.

Extension professor's research aims to reduce hog farm odor using biofilters

Pork brings us the wonderful aromas of bacon frying, pork chops grilling and ham baking. However, the odor from a hog house is less pleasant.

A University of Missouri Extension assistant professor of agricultural systems management is researching ways to reduce that odor. With funding from the MU College of Agriculture, Food and Natural Resources, Teng Lim uses biofilters to reduce the odor, dust and gas emissions from typical swine operations.

Lim has evaluated small-scale biofilters at commercial hog farms and concluded that these biofilters could be scaled up to reduce emissions from larger hog operations.

"We are trying to evaluate different potential media to improve the biofilters," Lim said. He is looking at biofilter materials at the MU Swine Research Center in Columbia. Wood chips are the primary medium used in the filters, though he also uses a puffed plastic material.

The biofilters at the MU hog facility have windows to observe the materials inside and are raised off the ground to keep them away from rodents. The rooms in the research barn have individual ventilation control systems and can be monitored online. The system uploads all data to a server and sends a daily email with data from the previous 24 hours.

Lim said the data lets researchers evaluate whether the pigs are comfortable and monitor temperature fluctuation, humidity and pressure to make sure the whole system is working.

When producers look to expand their operations or build a new barn, neighbors often have concerns about the odors. Lim said biofiltration is one of the least expensive ways to reduce odors and dust and should be part of farmers' best management practices.

"It also shows they are concerned with taking care of the environment and their neighbors and community as well," he said.

MU Extension structural engineers, air quality engineers, soil scientists and other specialists are working as a team to evaluate farms and offer recommendations on the best ways to mitigate odor and dust.

Lim is also conducting research on anaerobic



▲ *MU Extension assistant professor Teng Lim and graduate assistant Brandon Harvey examine the material inside a biofilter at the MU Swine Research Center. Lim's research centers on management systems to minimize odor, dust and gas from swine operations.*

digesters, which can help with managing waste and odor and provide a source of energy. Manure from the facility goes through a 21-day biochemical process that produces methane gas, which can be used to fuel generators and boilers, said Brandon Harvey, a graduate assistant working with Lim.

Harvey said a hog farm could meet its energy needs with an anaerobic digester and even earn revenue selling excess energy to the utility. For odor mitigation alone, however, a digester is a much more expensive proposition than biofilters, he said.

"Every farm is different, so we're trying to provide different options — viable options, sustainable options — for people to use," Lim said. "As hog operations expand, it is critical that they be responsible for the environment and be responsible for their community and neighbors. We want to make sure they have best management practices to adopt that improve their operations and minimize conflicts in their community."

In partnership with USDA's Natural Resources Conservation Service and soil and water districts, MU Extension held 26 Grazing Schools and one advanced school this past year, with an estimated total enrollment of 558. The economic impact resulting from the adoption of pasture renovation practices taught in these schools is estimated at \$83.6 million. In 2014, the schools passed two milestones: MU Extension has conducted more than 600 schools and educated more than 15,000 producers since 1997. The total area renovated because of the schools now exceeds 1.6 million acres.

Specialist aims to help farmers learn about the potential uses of drones

For centuries, farmers have braved the elements to walk their land to check for problems ranging from wind damage and calving cows to pests and predators.

Unmanned aerial vehicles, or drones, have potential to save farmers time and money with bird's-eye views of farmland, according to Bill Wiebold, an MU Extension agronomy specialist. Drones open the door for endless possibilities for precision agriculture, he said.

Currently, the Federal Aviation Administration (FAA) does not allow drone use for commercial purposes. In 2012 though, Congress directed the FAA to grant unmanned aircraft access to U.S. skies by 2015. The FAA has released a "road map" for potential drone use.

When that happens, Wiebold will be ready to help farmers learn about and adopt the new technology to help them on the farm. Wiebold's talks on drones during MU Extension crop conferences have drawn attention from producers anxious to learn about their potential uses.

Wiebold and other MU researchers have been studying how farmers can use the new technology. For example, farmers in Japan and Brazil have used drone technology for decades. As much as 30 percent of Japan's rice fields were sprayed by unmanned aerial vehicles in 2010, according to the nonprofit Association for Unmanned Vehicle Systems International (AUVSI).

The uses are as varied as Missouri farmland, Wiebold said. Entomologists may find the devices especially helpful for directed scouting of pests. Drones could collect information on plants that have grown to heights that make it difficult to walk



through narrow rows.

Additionally, farmers could use the unmanned devices to document conditions when applying for government programs such as crop insurance. They could also help with more day-to-day tasks, such as providing information to answer questions like "How bad was last night's hail storm? Are all of my cows on the north 40? Does my corn need more nitrogen?"

Although recent media attention has centered on unmanned aircraft as a way to deliver packages, commercial agriculture will probably be the greatest beneficiary from broader use of drone technology, Wiebold said.

A study by the AUVSI estimated that drone use could create 70,000 new jobs in the U.S. in five years after FAA approval. The group also estimates that 90 percent of

that economic activity will come from precision agriculture and public safety applications.

Drones suited for farm applications vary widely in cost and size. Entry-level aircraft cost \$500 to \$1,500 and can fly for 10 to 20 minutes without recharging batteries. Most weigh less than 5 pounds, have a wingspan of less than 3 feet and travel under 30 mph. For about \$300, farmers could install a camera in a drone that sends still or video images to a smartphone.

Entry-level systems can be guided by a handheld remote control. More sophisticated unmanned aerial vehicles can be programmed to fly designated routes using GPS and GIS technology, Wiebold said.

Wiebold's talks on drones during MU Extension crop conferences have drawn attention from producers anxious to learn about their potential uses.

The Water Quality program and select campus faculty support extension regional specialists on the development and implementation of a proposed course on Cover Crop Management. More than 700 farmers applied for cost-share assistance through the NRCS to establish cover crops. This course will increase knowledge and understanding of cover crop management to address environmental concerns and improve overall soil quality.



Nation's largest free-range egg business has roots in 4-H classroom program

Mid-Missourians can't get enough of the brown eggs sold by two Centralia brothers who started their business when the older brother was in first grade and inspired by a University of Missouri Extension 4-H project.

Dustin and Austin Stanton of Stanton Brothers recently shared their story of starting a business with teen would-be entrepreneurs attending Build-a-Business Camp during Summers @ Mizzou, an MU Extension 4-H program that brings youths to the University of Missouri to explore the campus and learn about college majors and career opportunities.

In 1999, Dustin's first-grade class hatched baby chickens through MU Extension 4-H's "Hatching Chicks in the Classroom" project. Names were drawn for the lucky winner who would take home the baby chicks that were incubated and hatched.

Dustin was disappointed when another classmate won the chicks, so his uncle bought him six chicks. Those chicks proved to be the beginnings of a business. By 2007, he had 500 chickens. It is now a 22,000-poultry operation, the largest free-range operation in the nation.

The brothers' operation houses free-range Hy-Line, Bovan and Tetra chickens. It's a daylong

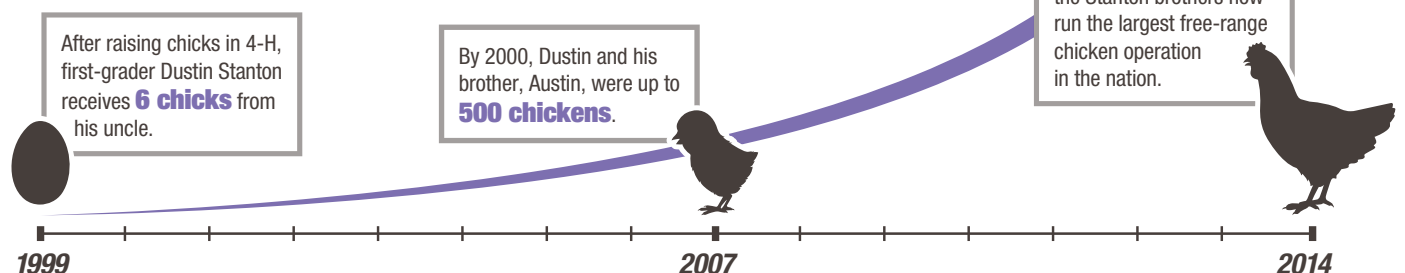


▲ *Dustin and Austin Stanton of Centralia are already running the nation's largest free-range chicken operation, which produces more 2.5 million eggs per year.*

job to gather, wash and box the eggs, which they distribute to retail outlets in mid-Missouri, college residence halls, nursing homes and grocers. They also sell their eggs at the Columbia Farmers Market and are the sole supplier for Isle of Capri Casino in Boonville.

Because their operation has grown so much, they now have two part-time employees

Growing a large-scale business





▲ **What began for the Stanton brothers as a hobby with six chicks has turned into an egg business with 22,000 head of poultry.**

and are building a state-of-the-art facility that automates egg gathering, washing and packaging. With the completion of a new 40-by-200-foot facility, chickens can lay their eggs on angled, elevated nests so that the eggs will roll to a conveyor belt that carries them to automatic washing, grading, sorting and packaging machines.

They hope the automation increases production levels and makes their processes less labor-intensive. Their job is not “sunrise to sundown.” They say it is “sunrise to whenever the job is

done,” and some days that might be midnight or later. They spend vacations combing the country for new equipment and learning how to improve their already successful business.

They grind 5 to 7 tons of feed weekly from milo grown on the farm that has been in their family since before Boone County was an actual county.

Their parents operate a 1,200-acre grain and cattle operation and help with the egg operation as needed.

Dustin is in charge of marketing, and Austin handles the production and technical side of the business. Working and living together might cause conflict between some brothers, but the Stantons maintain an environment of competitive fun.

The Stanton brothers have had many successes and failures along the way, including first picking a breed of chicken that is a “meat” chicken. They have consulted University of Missouri Extension specialists and learned through FFA and college courses.

They plan to stay on the family farm after they finish school because they think it is important to produce quality food locally and efficiently.

Their job is not “sunrise to sundown.” They say it is “sunrise to whenever the job is done.”



Missouri 4-H by the numbers

Missouri 4-H reached young people in every county of the state. Youth development specialists and other MU Extension team members worked with volunteers and community leaders to reach more than **290,969** Missourians ages 5 to 18. More than **one-in-five** Missourians from that age group participated in a 4-H educational program, the 4-H year-long club program, a 4-H short-term school enrichment experience, special interest activity, camps or after-school program. 4-H members are **three times more likely** to participate in community service than their peers.

After graduation, **77 percent** of high school seniors who have participated in 4-H programming pursue higher education, and **14 percent** enter the workforce.

4-H provides a great return on investment. According to a report by the Carnegie Council On Adolescent Development, the value of youth development programming provided by MU Extension 4-H faculty and staff was nearly **\$60 million**. With a budget of **\$7.4 million**, 4-H excels at leveraging public funds to provide valuable educational programming.



Missouri 4-H engages more young people in 4-H science, engineering and technology programming, which helps to address a nationwide demand for more high-tech workers. This year, 4-H provided science education opportunities for **76,217 youths**.

Missouri Summer Fire School educates firefighters in water rescue scenarios

Water is the firefighter's traditional weapon of choice, but it can also be a deadly enemy.

Missouri's plentiful rivers, streams and lakes are a treasured asset for fishing, boating and other activities. But accidents on the water can and do happen, as well as flooding emergencies, and many communities rely on firefighting personnel to undertake rescue operations.

"In today's fire service, we are multitasking like you wouldn't believe," said Todd Ackerson, chief of the Kansas City Fire Department's rescue division. He's also an instructor for the University of Missouri Extension Fire and Rescue Training Institute's (FRTI) Summer Fire School.

Despite the name, MU FRTI's Summer Fire School covers more than just fire. Ackerson teaches courses on boat rescue. "Fire departments all across the state are used for water rescue and boat rescue," Ackerson said.

Participants in boat rescue training spend one day in the classroom followed by three days of hands-on learning on the Missouri River, including an evening drill.

"Emergencies don't wait for good weather and daylight," said Corey Sapp of the Jefferson City Fire Department. "This is a very busy river, commercially and recreationally, so folks are on it all the time. The Jefferson City Fire Department responds to the river regularly, so we have to be prepared to respond effectively and safely."

In addition to specific rescue techniques, water rescue classes cover topics such as boat maintenance, trailering and launching procedures, and equipment placement.

"And you have to have total boat control," Ackerson said. "Anybody can hammer the throttle and hang on. That's not what this course is about.

"Emergencies don't wait for good weather and daylight."
– Corey Sapp



It's about teaching individuals how to operate those boats with finesse."

Ron Lowry of the Lake Ozark Fire District appreciates the challenges that the boat rescue training presents. "It's vitally important for us to get high-quality training with the conditions we'll

be experiencing out in the field," he said. "Debris in the water, going out at night — that's when calls happen. So when you get into a high-risk situation where everybody's

stressed out, you have that comfort of knowing you've done that, you've been there, and your training will not fail you."

The Summer Fire School also covers topics such as mass-casualty incidents, aircraft rescue firefighting and confined-space rescue. FRTI holds regional fire schools, seminars and specialized training on a range of subjects and scenarios, including counterterrorism, hazardous materials, industrial safety training and emergency medical services.

▲ ***Students in MU Extension's Fire and Rescue Training Institute's (FRTI) Summer Fire School practice water rescue operations on the Missouri River at Jefferson City.***

Continuing Medical Education programs provide learning opportunities for health care practitioners that incorporate the most up-to-date research and clinical guidelines available. In FY 2014, more than **1,800 programs** reached **27,322 health care professionals** across the state and around the world.

The **Fire and Rescue Training Institute (FRTI)** conducted **674 classes** with a total enrollment of **13,958 students** this year. The training received by these students equates to **169,243 instructional hours**. For every dollar FRTI receives from MU Extension, the institute **generated \$5.11** in funding to support training. Through FRTI's field extension program, the institute reached students in **113** of Missouri's **114 counties**, along with enrollments from **31 other states**, the District of Columbia, Guam and Puerto Rico.

Camdenton hosts 4-H robotics league

Central Missouri hosted some of the state's finest young minds at the Mid MO FIRST Robotics LEGO League qualifier at Camdenton High School.

Team members on University of Missouri Extension Camdenton 4-H Robotics LASER 3284 design, build and market robots during the after-school program.

With a population of 3,200, Camdenton is small, but its school district covers 372 square miles and draws more than 4,000 K-12 students. One in 20 of those students participate in the school district's internationally recognized For Inspiration and Recognition of Science and Technology (FIRST) program, working with 43 adult mentors and meeting via Skype with industry professionals who challenge and encourage the students.

From kindergarten through third grade, teams build a model with LEGO bricks. In fourth through sixth grades, students explore career options and build robots that can perform a series of tasks. In grades seven and eight, students develop an engineering notebook and design robots to compete. In grades nine through 12, students work with engineers to build a 120-pound robot.

Coach Mitch Comer and his wife, after-school program director Sherry Comer, worked with MU Extension's Camden County 4-H because of 4-H's longstanding commitment to STEM programs.

All program participants in the past four years are majoring in STEM fields at college. All members are college-bound this year, many with scholarships already in hand.

4-H youth specialist Michele Kroll leads "Fantastic Fridays," weekly meetings that introduce students to 4-H and other extension programs. Students perform community service for domestic violence shelters, Habitat for Humanity and the Optimist Club, among others. They also learn Gracious Professionalism and Cooperation — an attitude of cooperation, respect and integrity toward competitors.

The program also allows rural students to travel. Members have visited STEM businesses throughout the country and met with legislators in Washington, D.C. They have made more than 60 presentations to promote FIRST and STEM.

Brittany Bolz, a junior at Camdenton, has been in robotics for three years. She has seen Gracious Professionalism in action when robots broke and competitors came to the rescue. She plans to study



▲ **Safina Earnst, of Camdenton, prepares for the Mid MO FIRST Robotics LEGO League competition.**

biological or nuclear engineering.

"4-H has brought me out of my shell," she said. "It has made me aware that I can do so much more than I thought I could."

Freshman Brenden Barbour programs robots and scouts other robotics teams. "4-H has taught me leadership skills," he said.

Senior Garrett Johnson said he has had many scholarship offers and will attend Missouri University of Science and Technology in Rolla to become a petroleum engineer. Johnson finds it rewarding to mentor younger students at camps and after school.

"Little kids get frustrated, but it's neat to get to grow with a kid and get them to understand that you have to have downfalls in life to get solutions," he said.

UNIVERSITY PARTNERS

University of Missouri-Saint Louis



▲ **This year's class of Neighborhood Leadership Academy (NLA) graduates.**

The NLA is aimed at improving communities by developing leadership skills and implementing community improvement initiatives.

The University of Missouri-St. Louis (UMSL) has worked with MU Extension on the Community Partnership Project (CPP) for the past several years. This year, the CPP transitioned into Creating Whole Communities (CWC), which is UMSL's new community-building initiative. CWC leverages University of Missouri's expertise and resources in research, organizational capacity building, leadership development and civic dialogue to serve the St. Louis region.

CWC held a launch event to share its goals and objectives with community building leaders in the St. Louis region. The event drew a crowd of more than 200 university and community partners. The

community-building initiative also continued the successful "What's Brewing?" breakfast series that brought together faculty, community leaders and neighbors from across the region to discuss urban issues and share community revitalization success stories in the St. Louis region.

UMSL faculty worked with MU Extension's St. Louis Healthy Corner Store Project team to develop, manage and expand the project to additional St. Louis neighborhoods. CWC connected MU Extension faculty with social work classes that helped with the project.

The annual Neighborhood Leadership Academy (NLA) awarded the Chancellor's Certificate in Neighborhood Leadership to 20 leaders from across the St. Louis region. With the skills necessary to develop leadership, implement community improvement initiatives and manage community-building organizations, NLA graduates join a network of more than 200 alumni creating whole communities.

University of Missouri-Kansas City

The University of Missouri-Kansas City works with MU Extension through two primary units, the UMKC Institute for Human Development (IHD) and the UMKC Innovation Center. These partnerships reach into the community and build the capacity of individuals and organizations. The UMKC Institute for Human Development serves as the primary liaison between MU Extension and UMKC.

The Alianzas program, under the IHD, is now in its 13th year and helps Missouri communities recognize and respond to the unique challenges of Hispanic and Latino residents in Missouri. This year, Alianzas was instrumental in the Greater Kansas City Needs Assessment, which assessed current conditions, assets and needs of the Latino population in the greater Kansas City area. The results are being used to create a road map for policymakers, community organizations, educators, Hispanic families and students in Kansas City and around the state.

Urban Mission represents a matched contribution of UMKC and MU Extension to address pressing issues in Kansas City. The

Self-Determination Academy was created to encourage transition-age urban youths to be self-regulating and goal-setting, and to help them develop problem-solving skills to make meaningful decisions about their educational goals.

The UMKC Innovation Center inspires entrepreneurial efforts through a partnership between the university and the community. With several high-impact business outreach programs — such as the Small Business and Technology Development Center, the Procurement Technical Assistance Center and KCSourcelink — the center helped emerging and existing business owners create 336 new jobs and 44 new startups in FY 2014.



▲ **UMKC Urban Mission work focuses on urban youth leadership, communication, education and career development.**

Missouri University of Science and Technology

Missouri S&T's Office of Technology Transfer and Economic Development (TTED) is well-positioned to help grow Missouri's economy by advancing technology commercialization, encouraging entrepreneurship and facilitating business opportunities. TTED hosts a Small Business and Technology Development Center (SBTDC), part of the University of Missouri Extension SBTDC statewide network, to provide training and counseling to aspiring entrepreneurs and small business owners.

One year after launching VentureLab™ — a co-working space within the Technology Development Center — it is now home to 13 startups, growing ventures and support organizations. VentureLab is designed to provide a professional work environment and access to business and technology support through the SBTDC office for early stage companies.

New this year was an innovative program giving students an opportunity to pursue entrepreneurial ventures full-time. Missouri S&T's Entrepreneurial Internship and Cooperative Education Program (EICP) provides select students with awards of up to \$15,000 each so they can work full-time on starting a business for up to four months.

"Missouri S&T has a rich history of experiential learning," said Malcolm Townes, associate director for technology transfer and economic development. "Actually trying to start a real new business venture is the best way to learn about entrepreneurship. The EICP gives students that opportunity."

"Participating in the program has helped me in so many ways. It allowed me to have the time and resources to focus on my business idea," said Nick Rollins, one of the first EICP award recipients. "I have learned so much in the last three months. I truly believe that my time spent in the internship, along with the mentorship offered, have truly



▲ Connor Wolk displays an iPhone case created by his company, Dual Cases LLC, which got off the ground with help from the Student Business Incubator at Missouri S&T.

helped me establish a solid foundation to continue to build on."

Fifteen students representing 10 proposed new business ventures applied to the EICP in response to a request for proposal posted by TTED. Students representing four ventures were selected.

"It gives students an opportunity to manage their company themselves, but also provides a skeleton to make sure that forward progress is made," said Christopher Seto, cofounder of ProtoQ LLC.

Extension specialists with the SBTDC provided nearly 1,400 hours of direct counseling to 129 distinct clients — of whom 67 are long-term clients — in the Central Missouri region. The program helped start 18 new businesses, create 68 jobs and secure investment of just over \$5 million in new capital for the center's clients.

TTED's Technology Transfer Office received 45 invention disclosures, filed 29 patent applications and executed 22 licenses and options. The current license and options generated nearly \$368,000 in income for the university. The university was issued 15 new patents in the past year, including critical patents in bioactive glass and non-destructive screening portfolios. These patents will allow continued development of new products capable of healing massive and difficult wounds with greater ease and speed. TTED is also working to develop new tools to improve safety and security at large events and venues such as football games or marathons.

"Missouri S&T has a rich history of experiential learning. Actually trying to start a real new business venture is the best way to learn about entrepreneurship."
– Malcolm Townes

STATISTICAL DATA

Educational contacts cooperative extension — FY 2014

Program area	Direct contact total	Indirect contact total	Total contacts
Agriculture and Natural Resources	76,472	272,548	349,020
Human Environmental Sciences	881,153	822,788	1,703,941
Business Development	28,280	2,692	30,972
Community Development	9,122	218,764	227,886
4-H Youth Development	123,904	153,587	277,491
TOTALS	1,118,931	1,470,379	2,589,310

This chart includes both direct and indirect educational contacts. Direct contact occurs when participants are actively engaged in a learning process, whether in a group or individual setting, that promotes awareness and understanding of research-based knowledge and adoption of research-based practices. Indirect contact occurs when the distribution of information and resources does not meet the above definition of direct contact. This can include public events and dissemination of printed materials that deliver educational content.



◀ **Missouri pork producers stepped up biosecurity measures this year to keep the porcine epidemic diarrhea virus (PEDV) from spreading. University of Missouri Extension Swine Nutrition Specialist Marcia Shannon said these efforts have kept Missouri numbers lower than national figures.**

Missouri had 96 cases of PEDV compared to 1,646 in neighboring Iowa, 407 in Illinois, 214 in Kansas and 331 in Oklahoma. The disease has been reported in 27 states. Shannon credits improved biosecurity measures taken by pork producers such as Two Mile Pork, a family-owned operation near Monroe City. Their operation has taken several safety precautions against spreading PEDV.

The farm is closed to tours and delivery trucks. Deliveries are made to an off-site office, fumigated with a disinfectant and taken to the farm in a vehicle that has been washed and dried thoroughly before entering the farm. Employees wear clean disposable booties that have not touched the ground to create a line of separation.

Spreading word about district option

Gov. Jay Nixon signed House Bill 542 into law, giving county extension councils the option to work with one or more other county councils to form extension districts. Since then, county council members have been educating stakeholders about how to take advantage of this new option.

“The main purpose of the district option is to help counties increase efficiencies and reduce costs by working together,” said Michael Quart, MU vice provost and director of extension.

Quart noted that the legislation does not require councils to form districts.

“This is an option and nothing more,” he said. “But it’s an important option for many counties that struggle to maintain extension services during times of limited funding.”

Council members work with regional specialists to provide county educational programs, oversee finances of local extension operations, provide personnel to carry out extension activities, and elect and organize the local extension council.

An MU Extension State Council committee developed a

manual that provides answers to frequently asked questions from across the state, resources available to support education of county councils and regional faculty and long-term rollout suggestions, among other information that might be useful to county extension councils.

“This legislation allows for local solutions,” said H.C. Russell, then-chair of the University of Missouri Extension State Council. “It provides county councils greater control over how they manage their costs and gives communities more flexibility to dedicate resources to extension programs that best meet their needs.”

County councils that chose to form an extension district would appoint representatives to a governing board. Since the law passed, the county council coordinator — a member of the MU MU Extension State Council Committee — has been meeting with county councils to discuss the first phase of the district option to provide educational programming and support county councils with additional resources as needed.

Summary of continuing education noncredit activities — FY 2014

Continuing education unit	Number of activities	Attendance total	Individual hours of instruction	Student FTE*
Continuing Medical Education	1,821	27,322	2,765	230.2
Fire and Rescue Training Institute	674	13,958	10,588	564.1
Labor Education	33	775	302	20.5
Law Enforcement Training Institute	75	1,334	2,903	213.0
Missouri Training Institute	510	14,174	1,937	134.7
MU Nursing Outreach	70	1,889	27	47.5
Osher Lifelong Learning Institute	109	1,853	634	35.9
MU Conference Office**				
Agriculture, Food and Natural Resources	18	4,210	377	207.4
Agriculture, Food and Natural Resources Extension	2	142	28	7.1
Education	1	413	16	29.4
Engineering	4	280	106	16.5
4-H Youth Development	2	368	112	40.5
Human Environmental Sciences Extension	1	117	16	8.1
Journalism	2	89	29	4.5
Medicine	2	318	18	13.3
MU Administration	11	2,693	174	233.4
MU Extension	5	876	67	60.7
Veterinary Medicine	1	76	12	3.4
Conference Office-hosted	14	6,438	302	495.7
Conference Office totals	63	16,020	1,255	1,119.8
TOTALS	3,355	77,325	20,410	2,366

This table includes noncredit activities reported through MU continuing education units and does not include contacts by cooperative extension specialists.

* Student FTE = Student full-time equivalent

** Two other MU Conference Office activities with attendance totaling 1,927 have been distributed among their related academic areas and are represented in the MU Extension unit totals in this table.



◀ *The Mizzou Mobile Turfgrass Diagnostic Lab is a laboratory on wheels that can respond to turf problems on golf courses and sports fields quickly and effectively. Many turf diseases can spin out of control if not treated in a timely fashion.*

“The lab is outfitted with lab tools, microscopes and a workbench that allow me to take a close look at the sample and identify the disease-causing agent,” said Lee Miller, turfgrass pathologist for University of Missouri Extension. “With the lab, turfgrass managers don’t have to wait while samples are shipped back and forth to a plant diagnostic lab.”

Miller said the response to the Mizzou Mobile Turfgrass Diagnostic Lab has been overwhelmingly positive. The lab has been able to provide fast diagnosis and treatment, helping to keep golf courses and sports fields in tip-top shape.



PROGRAM SUMMARIES

Agriculture and Natural Resources

Marc Linit, PhD, associate dean

David Baker, program director and assistant dean, College of Agriculture, Food and Natural Resources

cafnr.missouri.edu/extension

The MU Agriculture and Natural Resources Extension program builds on Missouri's wealth of natural and human resources and its sophisticated business base.

In partnership with NRCS and the soil and water districts, the program held 26 Grazing Schools this year. The economic impact resulting from the adoption of pasture renovation practices taught in these schools is estimated at \$83.6 million.

MU Nursing Outreach

Shirley J. Farrah, PhD, RN-BC, director and assistant dean, Sinclair School of Nursing

nursingoutreach.missouri.edu

MU Nursing Outreach provides high-quality, affordable and accessible professional development programs primarily for Missouri's nurses, but also for social workers, dietitians and health educators, among other health care professionals. With a half-life in nursing knowledge of less than five years, professional nurses benefit from the latest in evidence-based knowledge and skills.

In FY 2014, Nursing Outreach's educational activities served 1,889 nurses and other health care providers, and another 944 nurses participated in co-sponsored multidisciplinary programs with MU Extension's Continuing Medical Education program.

Community Development

Marc Linit, PhD, associate dean

Mary Simon Leuci, EdD, program director and assistant dean, College of Agriculture, Food and Natural Resources

extension.missouri.edu/cd

The Community Development program helps Missourians and their communities tap into local strengths by focusing on five major themes: leadership development, decision-making, economic viability, inclusion and empowerment and emergency preparedness.

For example, the ExCEED program has created or retained 1,672 jobs, attracted 21,101 volunteer hours valued at \$256,170 and attracted more than \$55 million in business loans and investments in FY 2014.

Human Environmental Sciences

Jo Britt-Rankin, PhD, program director and associate dean, College of Human Environmental Sciences

extension.missouri.edu/hes

Human Environmental Sciences Extension improves Missourians' quality of life with face-to-face and Web- and Internet-based education that touches on many aspects of day-to-day life.

In FY 2014, the program reached more than 880,000 Missourians in all 114 counties with programs in housing, personal finance, relationships, nutrition, health and physical activity.

4-H Center for Youth Development

Ina Metzger Linville, PhD, director

4h.missouri.edu

For more than a century, Missouri 4-H programs have helped young people learn leadership, citizenship and life skills, as well as meet key developmental needs and pursue educational goals.

In FY 2014, 4-H programs reached more than 290,000 youths ages 5 to 18 in every corner of the state; that translates to 1 in 5 Missourians in this age group. 4-H also provides a great return on investment, with each dollar of public resources invested in Missouri 4-H leveraging \$8.66 to serve young people and families statewide.

Missouri Training Institute

Alan St. John, director

mti.missouri.edu

The Missouri Training Institute, housed in MU's Trulaske College of Business, provides continuing education, custom-designed training programs and business consulting services for business, industry, public and nonprofit organizations, and educational institutions.

Training programs cover human resource management, supervision, management, leadership, team building, effective decision-making, generational differences and business writing. Consulting services include human resources, strategic planning, board development and board retreats.

Labor Education

Paul Rainsberger, JD, director

labored.missouri.edu

In FY 2014 the MU Extension Labor Education program worked with 773 members and leaders of organizations that represent the economic interests of some 25,000 employees in Missouri and neighboring states to help them develop skills to contribute to their organizations, act effectively in the workplace, and become informed and active participants in their communities.

Business Development

Steve Devlin, program director and associate dean, entrepreneurship and economic development, College of Engineering

missouribusiness.net

During FY 2014, the Business Development program helped clients start 227 new businesses, create or retain 9,005 jobs, increase sales by more than \$224 million, acquire more than \$166 million in new financing, pursue and acquire \$8.7 million in research grant awards, win 4,235 local, state and federal government contracts totaling more than \$303 million.

Fire and Rescue Training Institute

David E. Hedrick, director

mufri.org

MU Extension's Fire and Rescue Training Institute provides comprehensive continuing professional education and training to Missouri fire service, emergency responders and allied personnel.

In FY 2014, the institute trained firefighters representing 113 of Missouri's 114 counties for a total enrollment of 13,958 fire and emergency responders.

Law Enforcement Training Institute

John Worden, director

leti.missouri.edu

The Law Enforcement Training Institute develops and provides state-of-the-art training and education programs to law enforcement practitioners, civilian professionals and laypersons.

For 66 years, the institute's faculty and affiliated professionals have provided basic pre-service and specialty in-service instruction to both law enforcement academy students and veteran officers who serve in local, state and national public safety.

Osher Lifelong Learning Institute

Don Nicholson, PhD, director

learnforlife.missouri.edu

MU Extension's Osher Lifelong Learning Institute delivers quality courses designed to complement the interests, concerns and lifestyles of the over-50 adult. Many over-50 adults enjoy learning for the pleasure of learning. And the institute realizes that older citizens need intellectually stimulating courses that fulfill this need.

Courses are led by cutting-edge professionals and active and emeritus MU research professors in a learner-friendly style.

Continuing Medical Education and Cooperative Extension Health Education

Kathleen Quinn, PhD, interim director

som.missouri.edu/CME

The Continuing Medical Education program works to improve the health literacy of Missourians by developing, implementing and evaluating both clinic-based and community-based chronic disease prevention and self-management interventions.

Veterinary Medical Extension and Continuing Education

Craig Payne, DVM, director

vmth.missouri.edu

Veterinary Medical Extension and Continuing Education collaborates with organizations, industry and other MU faculty to provide educational opportunities and up-to-date information for veterinarians and animal owners.

The program addresses issues that have widespread impact on Missouri veterinarians and livestock owners.

MU Conference Office

Jewel Coffman, interim director

MUconf.missouri.edu

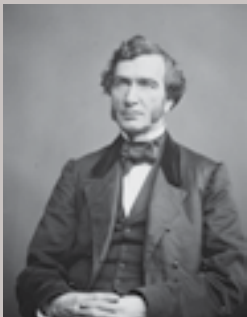
The MU Conference Office was created in 1963 to provide high-quality, professional, full-service meeting management for a variety of noncredit educational programs such as conferences, workshops, seminars and symposia.

Whether a meeting is hosted on the MU campus, elsewhere in Missouri or anywhere in the world, the office's professional staff helps create the best learning environment for participants.



MU EXTENSION: CELEBRATING THE PAST, BUILDING FOR THE FUTURE

100 YEARS



Sen. Justin Morrill might be considered the father of the U.S. system of land-grant universities and the grandfather of extension. He believed that the key to democracy, peace and prosperity was to provide education for all Americans.

In 1862, after multiple tries, Congress passed the Morrill Act, and President Abraham Lincoln signed it into law. The act granted federal lands to each state to fund the establishment of at least one college in the state.

Realizing that not everyone could go to college, Congress established the Cooperative Extension Service with the Smith-Lever Act in 1914. The purpose of the act

was “to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture.”

Over the years, legislation affecting extension has brought about changes. And extension’s clientele and teaching methods have changed. Extension’s mission is still every bit as viable and crucial as it was at the time of its creation — to bring reliable, responsive and relevant research-based information from the university to the citizens of Missouri.

On May 1, MU Extension celebrated its 100th birthday on campus. Extension faculty and staff from across the state shared information with MU students, faculty and staff about how extension programs and services improve the lives of Missourians.

Chancellor R. Bowen Loftin and Michael Quart, vice provost and director of MU Extension, spoke about extension’s history and successes from the past 100 years and said that extension must continue to look for unique opportunities for the future. One unique opportunity is a new partnership between MU Extension and the student service-learning organization, Alternative Breaks. This group will place students in all 114 Missouri counties over the next five years to conduct community service projects.

From rail car classrooms to virtual field days

THEN

In the 19th century, governments and universities reached out to rural communities by building mobile classrooms in rail cars. In the 20th century, extension agents helped citizens form rural telephone companies and library districts, and later set up the first distance learning centers.

NOW

Today, extension specialists use a variety of communication methods to reach Missourians in convenient, affordable and effective forums. Although poultry farmers prefer virtual field days to avoid bringing diseases or contaminants to one another’s facilities, crop farmers prefer to attend hands-on irrigation field days at the University of Missouri Delta Center to learn how to increase efficiency in their operations.

Alternative Breaks encourages students to spend their spare time giving back

The stereotype of college students spending their free time drinking and getting into mischief may soon be shattered. It appears today's college students, the millennial generation, value service more than a weekend party.

A 2010 Pew Research Center study asked millennials about their priorities. Being a good parent, having a good marriage and helping others in need made the top of their list.

"These students want to give, they want to help out, they want to be part of the community," said Joy Millard, interim assistant vice provost for University of Missouri Extension.

As part of its centennial, MU Extension partnered with Mizzou Alternative Breaks, a group of students who spend weekends, holidays and spring break going into a community to serve a need. MAB has no shortage of student volunteers.

"We had more than enough students to fill all the trips. We had to turn people away," said Stephen Smith, a senior at MU and director of MAB's weekend services. "It's an honor to go on an Alternative Breaks trip, and we're really proud of that."

For one weekend in November, the students went to work at Kingdom Projects, a nonprofit organization in Fulton that employs disabled adults.

"We repainted and reorganized the resale shop. We also sorted donated clothes into men's, women's and children's clothing," said Emily Hampton, site leader and an MU sophomore.

Many students find the experience to be a valuable, eye-opening opportunity to help others.

"I've lived in the same small town my whole life. So going to different places and seeing that not everyone does life the way I do life is life-changing. It broadens your perspective," Hampton said.

The partnership between MAB and MU Extension benefits both organizations, Millard said.

"What I love about this is it's bringing students into communities, and the communities also give



▲ **MU student volunteers Abigail Straatmann, left, and Catherine Nania at Kingdom Projects in Fulton, Mo.**

back to the students. It's this wonderful circle of life," she said. "It's what we were created for, making people better, helping them out and making lives better."

MAB makes use of MU Extension's community connections to determine which of Missouri's counties is in the greatest need.

"MU Extension is our eyes and ears in the community," Smith said. "Before the partnership, site leaders had to call random organizations to try to find projects."

MAB's goal is to help every Missouri county over the next five years. "Here are students who say they want to come help. In a time of limited resources, this is an amazing gift," Millard said.

Walking through the Kingdom Project warehouse, you see students laughing and working hard.

"The joy that comes from being here is better than any social event that I could be going to this weekend. It's worth every minute," Hampton said.



▲ **MU students Luci Pak, left, and Minh Nguyen volunteer at Kingdom Projects in Fulton, Mo.**



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