Greetings,

The College of ACES has experienced a steady increase in its undergraduate student enrollment over the past three years. For the 2013–14 academic year, 2,771 undergraduates are enrolled, 5 percent more than the previous year. Not only are more students applying to ACES and being accepted, but the quality of these young men and women remains very high.

There are multiple reasons for this increase in both freshmen and transfer students, beginning with the caliber of education offered by our first-rate faculty and staff. ACES graduates are in high demand—many receive multiple job offers from top-ranked employers or acceptance from prestigious graduate or professional schools. As prospective students consider their options, it is important that we—and you—reach out to communicate the varied career opportunities available to ACES graduates.

On the administrative front, I am pleased to let you know of several additions. Dr. Sharon M. (Shelly) Nickols-Richardson is providing leadership for our Department of Food Science and Human Nutrition, and Dr. Susan Silverberg Koerner is leading our Department of Human and Community Development. These new department heads joined us last summer.

Dr. George Czapar assumed his role as associate dean for University of Illinois Extension and Outreach and director of U of I Extension in October. Dr. Czapar brings a deep understanding of Extension’s mission and value, along with an exceptional record of research and teaching. We extend deep thanks to Dr. Robert Hoeft, who over the last four years skillfully led U of I Extension through major programmatic and organizational changes.

We hope you enjoy this issue of ACES@Illinois. Please be sure to stay in touch with your friends and colleagues in ACES.

Best wishes,

Robert Hauser
Dean of ACES

Student body president one of ACES’ own

Damani Bolden, a senior in ACES, was elected last April to serve as the University of Illinois student body president during the 2013–14 academic year. Bolden is passionate about making a difference during his year of service. “I want to make sure that when senators, interns, or committee members are a part of student government at the University of Illinois, this isn’t the last stop of their development and growth as a leader,” he said.

Bolden, a Chicago native, is majoring in agricultural and consumer economics with a concentration in public policy and law. Of ACES, he believes that the college “is a phenomenal place. People in ACES really know who you are, and that’s exciting. Having an advisor who knows my academic progress as well as they know me provides a great experience.”
Interest in locally grown foods and urban agriculture has grown dramatically over the last decade.

Crop science researchers Sam Wortman and Sarah Taylor Lovell are working to identify the challenges of this emerging sector of the local food economy. In recent studies in Chicago neighborhoods, they identified threats to the growth of urban agriculture, and they have set forth future research questions that scientists must tackle to ensure its economic and environmental sustainability.

Germán Bollero, head of the Department of Crop Sciences, noted that “we are a department concentrated on food production and security, so we want to be in the conversation about producing abundant and safe food in ways that minimize environmental impact. We’re a corn and soybean state, but part of our population is in Chicago, and the discussion of food and food security happens a lot there. It’s important for us to be part of that.”

The researchers indicated in a recent report that this scaling-up of U.S. urban agriculture is driven in part by the goal to make the food production system more sustainable, resilient, and socially just.

“If urban agriculture is going to move toward a more profitable, environmentally sound system, ecologists, hydrologists, horticulturalists, environmental scientists, and others will need to take up this issue, or it will continue to be just a nice concept that academics like to talk about. We’ve got to get our hands dirty and figure out the real challenges and how to solve them,” Wortman said.

Wortman is looking at alternate soil management systems to address limited availability of uncontaminated land in cities where food can be grown, as well as the soil issues involved with growing food in vacant lots. Methods such as raised beds, compost selection, and producing fruits and vegetables in high tunnels versus open fields have been part of his studies.

Lovell’s interest is the associated functions of urban agriculture, such as ecological and cultural benefits. “My interest in neighborhoods in Chicago is understanding how urban agriculture doesn’t provide just food but also community networking and cultural and heritage connections,” she said. “How do we integrate a strong local foods connection in Illinois, which has been primarily corn- and soybean-oriented?”

John Taylor, a doctoral candidate working with Lovell, has looked at Chicago neighborhoods to identify the amount of land devoted to gardening, with results suggesting that urban gardens are contributing to the city’s food production.

“People are more interested in producing at least some of their own food and knowing where food comes from,” Bollero said. “Chicago could be a model city in this discussion. We want to be part of that, not just in the city itself, but also in the suburbs. We are interested in the interface between rural and urban. Especially in the western and southern suburbs, you see a transition from corn and soybean to things more horticulture-oriented.”

With no real financial backing from industry yet, finding resources to support this movement is also a challenge.

“A lot of the research going on in commercial agriculture is highly supported by and connected to industry. Yet there’s this whole population of urban farmers who don’t have the historical knowledge of food production and are not getting the same level of support in other ways. There are research questions we can answer for this group,” Lovell said.

Bollero agreed that for urban agriculture to take off, it needs sustained support.

“Sam and Sarah work hard at attracting funding,” he said. “That constant stream of financial support you have in other disciplines is not there yet for urban agriculture. There’s a lot of interest—even the White House talks about eating healthier and having your own garden. But it would be nice to have a specific program targeting urban agriculture.

“Hopefully some of that will change. I am optimistic,” he added.
Illinois might be known for growing clover and cranberries rather than corn and soybeans had farmers a century ago refused recommendations from extension agents of the day to apply lime to the state's highly acidic soil. Demonstrations at agricultural experiment stations and on farmers' fields across the state convinced farmers to use lime as an additive to balance soil pH, making it possible to produce abundant crops of corn, soybeans, alfalfa, and other pH-sensitive plants.

“Lime is made of calcium carbonate, which is also an ingredient in cement, so farmers feared using it. They thought it would make the soil hard,” said Robert Hoeft, who retired in August as director of U of I Extension.

According to Hoeft, the use of lime is just one example from the past 100 years of the value of the national extension service, whose mission is to bring research-based information to the public. Hybrid corn is another example.

“The process to produce hybrid corn was created by university scientists and passed on to companies to grow and market the seed to farmers. Extension played a large part in getting farmers to adopt the use of hybrid seed by establishing demonstration plots in farmers' fields. Planting these demonstration plots near well-traveled roads gave farmers the opportunity to visit them to observe the difference in disease pressure and ultimately in yield between open-pollinated and hybrid corn,” Hoeft said.

In the mid-1930s, many farm families—unlike their city neighbors—lacked access to electricity. The combined efforts of county extension staff and local citizens to create rural cooperatives eventually brought electricity to all of rural America. In later years, similar partnerships organized rural water systems. Today, extension staff members are working with companies to expand high-speed Internet connectivity to rural areas.
In October, George F. Czapar was named the new associate dean and director of the Office of Extension and Outreach. Czapar has deep roots in extension, from a summer internship in Tazewell County to being extension educator and water quality coordinator at Illinois to six years in agronomy extension at Iowa State University. He has led several interdisciplinary research projects on water quality and recognizes the importance of integrating extension with research and teaching. “These are exciting times for U of I Extension,” Czapar said. “The opportunities for collaboration have never been greater.”

Although the roots of extension are in the rural agricultural community, U of I Extension has evolved to serve urban areas as well. “Major efforts are being expended to improve the diets of Illinois residents in both rural and urban areas—diets that will help reduce health problems associated with obesity, including diabetes and heart disease,” Hoeft said.

Food deserts—where residents lack access to a full-service grocery store—are problematic in both rural and urban settings. “Often people lack transportation to a store,” Hoeft said.

In the East St. Louis area, one way U of I Extension is addressing the problem is to lease a bus once a month to transport affected residents to a grocery store, providing education during the ride about how to buy healthy food.

“On the trip back, extension specialists teach how to process and store the food that was bought,” Hoeft said. “Without this program, many of the people being served would have to purchase groceries in a convenience store that doesn’t carry fresh fruits and vegetables.”

There may be fewer extension specialists per county today than in the 1980s, but technology has allowed the organization to adapt and increase its reach. Today people can watch an extension webinar online from home. If they watch during the live broadcast, they can submit a question to the presenter and get an immediate answer.

“Today people want information faster,” Hoeft said. “Extension’s farmdoc website and its new mobile app are examples of how we have responded to farmers to provide information when and where they want it.

“Those who were active in those early years of the extension service would be amazed at where we are today,” Hoeft said. “And I can’t begin to envision where we’ll be 100 years from now.”

For more about the Illinois 100th-anniversary celebration of the 1914 signing of the federal Smith-Lever Act establishing the state-based cooperative extension services, visit web.extension.illinois.edu/100yrs.
Members of the J. Miles and Maribel McGrew family of McDonough County have been connected to Extension and 4-H for multiple generations. The McGrews were honored with the Illinois 4-H Foundation 2013 Family Spirit Award.

Miles’ and Maribel’s 11 children all were involved in 4-H, and over the years, 17 spouses, 31 grandchildren, 27 great-grandchildren, and two great-great-grandchildren have been part of 4-H in seven states.

One son, Jim McGrew, served as a 4-H leader for 35 years and in 2006 was inducted into the Illinois 4-H Hall of Fame. Jim’s eldest daughter, Judy, made 4-H a part of her career, serving as a 4-H youth development educator with University of Illinois Extension for 22 years. She developed multiple program materials and trained more than 20,000 4-H youth, volunteers, and professionals.

The McGrew family said their involvement in 4-H and Extension has affected them in innumerable ways, teaching them teamwork, leadership, and communication skills. They learned practical information that could be applied to everyday situations and economic principles that provided them with tools to succeed. It has helped them build strong, responsible families, whose members have gone on to careers including Illinois state representative, nurse, teacher, business owner, farmer, school superintendent, physical therapist, music therapist, and EMT. Others have served, or are serving, in the Army, Navy, Air Force, Marines, and National Guard.

“With 90 4-H family members in five generations, the McGrew family symbolizes a family that ‘bleeds green!'” said Angie Barnard, director of the Illinois 4-H Foundation. “The foundation thanks them for their contributions to the 4-H program over the years. This family signifies what it means to ‘Make the Best Better.'”

“It Can Wait,” urges 4-H

Illinois 4-H partnered with AT&T during August and September in the “It Can Wait” campaign, as its members encouraged drivers to take the pledge not to text while driving.

Illinois 4-H members asked drivers to help make the state safer and to save lives by sending Illinois 4-H a simple text message to signal their commitment. “It’s a small way to make a big difference,” said Angie Barnard, executive director for the Illinois 4-H Foundation.

When AT&T approached Illinois 4-H about a partnership during the month-long initiative to curb distracted driving, Barnard said, leaders saw it as a “perfect fit” in meeting 4-H’s goal to promote advocacy skills among its members.

AT&T presented these facts in the effort to end texting and driving:

• More than 100,000 crashes a year involve drivers who are texting (Source: National Safety Council)
• 75 percent of teens say texting and driving is “common” among their friends (Source: AT&T Wireless Survey)
• 97 percent of teen drivers say texting while driving is dangerous—yet 43 percent admit to doing it (Source: AT&T Teen Driver Survey)

“The members of Illinois 4-H were committed to making a difference in the ‘It Can Wait’ campaign, as we encouraged friends and family members to take the pledge to never text and drive,” said Barnard. “We were excited to spread the message through the state with our 23,000 members in 1,250 4-H clubs.”

Representatives from Illinois 4-H and AT&T Illinois, as well as state representative Naomi Jakobsson, spoke at a press conference on September 19, which was the national “Drive 4 Pledges Day” in the campaign.
Student farm helps break salsa record

U of I students set a Guinness World Record for the largest batch of salsa while highlighting locally grown produce, some provided by the university’s Sustainable Student Farm.

The massive batch of salsa, assembled at the university's August new-student convocation at Memorial Stadium, weighed in at 6,840 pounds. This beat the previous record of 5,868 pounds held by an organization in Spain.

The student farm, part of the Department of Crop Sciences, provided 1,200 pounds of tomatoes, 20 pounds of jalapeños, and 200 pounds of onions for the salsa, according to Zack Grant, a research specialist in crop sciences and manager of the farm.

The farm has an ongoing relationship with University Housing, providing produce to dining services nine months of the year. Grant said students began harvesting the tomatoes on the farm just south of campus two days before the new-student event.

“That was just what we were able to harvest that week,” Grant said.

Bruce Branham, a crop sciences professor who oversees the farm, said that cool temperatures in July slowed the development of the tomato crop. “It’s kind of instructive regarding locally based food systems. On one hand you have greater food security growing your own food, but sometimes you have to make other plans.”

“For something made in such a large quantity, the salsa turned out quite delicious,” said Dawn Aubrey, associate director of housing dining services. Part of what wasn’t eaten that day was divided among the campus dining units to be frozen and used later as a base for chili.

A Guinness World Records adjudicator was present for the preparation, assembly, and serving of the salsa and presented U of I with a certificate for the record-breaking batch.

Visit thefarm.illinois.edu for more about the Sustainable Student Farm.

Are green goals being met? New course evaluates sustainability projects

When projects are developed to reduce pollution and conserve natural resources, what performance metrics are considered in designing and funding them? After such projects are implemented, how are assessments made to ensure the goals are being met and to identify potential improvements? That’s the topic for a new course in the Department of Natural Resources and Environmental Sciences.

“Sustainability Metrics and Assessment Techniques” is being taught by Warren Lavey and Jody Endres. NRES undergraduates Claire Grogan, Jordan Williams, and Rachel Lauter helped prepare materials for the course.

“We will use projects funded by U of I’s Student Sustainability Committee as case studies to apply analytical frameworks such as life-cycle analysis and accounting for direct and indirect environmental and energy effects,” Lavey said. “The projects include the sustainable student farm, solar energy systems, energy-efficiency retrofits of buildings, energy control systems for buildings, LED lighting, water-conservation equipment, and programs to reduce petroleum usage in transportation.”

Among the projects to be evaluated are solar energy panels and plantings on the roof of the Business Instructional Facility. In 2009, the College of Business building received the highest rating of platinum in the U.S. Green Building Council’s LEED certification, an international standard for green buildings.

The course topics are important, Endres said, because decision makers should be equipped to assess the impacts of projects that have been implemented and to apply this experience in selecting, designing, and funding new ones.

“Once a project is in full swing, project managers must deploy assessment and feedback mechanisms to evaluate its effectiveness in meeting the stated goals. The biggest challenge is training people to conduct and review evaluations and to communicate those results to stakeholders.”
Researchers evaluating the biomass potential of woody crops are taking a closer look at the black locust (*Robinia pseudoacacia*), which showed a higher yield and a faster harvest time than other species that were evaluated, said crop scientist Gary Kling.

"*Robinia pseudoacacia* is showing great potential as a biomass crop for midwestern energy production, outyielding the next closest species by nearly threefold," Kling said. "We picked the best crops and moved those forward. Now we want to move to the next step, which is improved selections.

"For now the only thing you can do with black locust is use it for direct combustion," he added. "But if it becomes a major crop, other researchers could start working on the process of how to break it down."

Kling's role in the feedstock production/agronomy program, funded by the Energy Biosciences Institute, is to improve the production aspects of bioenergy crops. While other researchers in the program have evaluated Miscanthus, switchgrass, and prairie cord grass, Kling is examining which short-rotation woody crops grow best in the Midwest.

This spring, a preliminary check on the black locust crops showed a yield that exceeded what was produced over the first two years' growth. Based on these encouraging findings, Kling said, two new experiments have been started, both looking at different germplasm for black locust crops.

"Illinois has a lot of land that is subpar for corn and soybeans, such as the southern part of the state and along rivers in the north. Black locust could be cultivated in some of that area in large acreage. This would be well-suited to smaller producers who want to generate some of their own fuel," he said.

Kling and his team presented the findings from their evaluations at the EBI Feedstock Symposium last August.

Although sorghum lines underwent adaptation to be grown in temperate climates decades ago, a researcher and his team have completed the first comprehensive genomic analysis of the molecular changes behind that adaptation.

Patrick Brown, who studies plant breeding and genetics, said having a complete characterization of the locations affecting specific traits will speed the adaptation of sorghum and related grasses to new production systems for both food and fuel.

Brown is working on the project through the U of I Energy Biosciences Institute, hoping to use the findings as a launching pad for working with complex genomes of other feedstocks.

To adapt the drought-resistant, tropical sorghum to temperate climates, Brown explained, sorghum lines were converted over the years by selecting and crossing exotic lines with temperate-adapted lines to create others that were photoperiod-insensitive for early maturity, as well as shorter plants that could be machine-harvested.

"Surprisingly, no one had ever really genotyped these lines to figure out what had happened when they were adapted," Brown said. "Now that genotyping is cheap, you can get a lot of data for a modest investment."

He added that previous studies looked at a specific genomic region or a smaller subset of these lines. "This is the first study to look at all of them. We got a bigger picture that was completely technology enabled," he said.

Brown said this new information will help to unlock the diversity in the exotic lines and bring it into grain sorghum.

"Part of the reason for caring about all of that now is that up to this point, sorghum has been grown mostly for grain. It's pretty short stuff, doesn't blow over on the windy high plains, and is really hardy. But now there is a lot of interest in using sorghum for other things, such as growing sweet sorghum in areas where they grow sugarcane and growing biomass sorghum for bioenergy through combustion or cellulosic technology."
Regulating biofuel species so they don’t become one more weed

In the United States, only species listed on state or federal noxious weed lists are regulated, and those lists are often biased toward species that affect agricultural crops. State and regional invasive-plant councils compile lists of species that affect natural landscapes, but these lists have no regulatory clout. Lauren Quinn and A. Bryan Endres of the U of I Energy Biosciences Institute have developed suggestions to improve the regulation of all invasive plant species, including new biofuels plants.

“We’re hoping to reform the way that the lists are developed, using the USDA’s weed risk assessment that looks at the potential invasiveness of a new species,” said Quinn, an invasive plant ecologist.

Using the system, the invasive species council in each state would rank plants.

“High-risk species would be regulated on a new noxious list, but low-risk species would not be regulated,” Quinn said. “Species for which insufficient data is available for the assessment would be placed on a ‘caution’ list that would demand further investigation prior to release.”

Quinn and Endres also propose a negligence-liability scheme in case a plant turns out to be invasive.

“Right now, highly invasive plants can be sold without any consequences at all, unless they are on the noxious weed list,” said Endres, a professor of agricultural law. “The regulation is directed exclusively at what might impact agriculture, but horticulturalists are developing new plants for home landscaping that might be highly invasive and should be regulated,” he said.

Endres said that the recommendations won’t threaten the development of new biofuels crops.

“The biggest threat to the biofuels industry is unsubstantiated claims that new varieties will become invasive species,” Endres said. “Solid regulation to govern the industry will create more certainty. Developers don’t want to commercialize a biofuels plant that’s going to cause trouble later on.”
Jeff Brawn says that seeing an elephant in the zoo is cool, but seeing one in the wild gives you that stomach-dropping feeling you get in an elevator—or maybe a space shuttle. Brawn, head of the Department of Natural Resources and Environmental Sciences, led the ACES “wildlife discovery” study tour to South Africa for the fourth time last summer. The group included nine students, one wildlife guide, and one professor—because that’s how many people fit into a safari vehicle.

“The purpose of the trip is to observe wildlife in African ecosystems,” Brawn said. “It may be the first time students have viewed wildlife like this—up close and personal, with very large animals in a free-living environment.”

After enduring a 17-hour plane trip, the students spend about 2 1/2 weeks in two very different wildlife reserves. “Kruger National Park is the size of Israel, so it’s big—and there are rules about not getting out of your vehicle,” Brawn said. An adjacent area, called Sabi Sands, allows visitors to get out of the vehicle and take wildlife walks. “One summer at Sabi we parked under a tree and watched a leopard eat an antelope that it had just killed.”

For obvious reasons, visitors don’t go anywhere without a guide carrying a rifle. “The guides are trained to read the danger signs in wildlife,” Brawn said. “If an elephant moves its ears or vocalizes in a certain way, the guide recognizes that it is getting upset and we need to move off.”

And unlike Yosemite and other national parks in the United States, electric fences enclose all of the areas where people camp. “When the students go into their cabins at night, they’re not allowed to come out until morning—because leopards, lions, and hyenas will come in. We are there at a relatively safe time of year. It’s their winter, so it’s actually quite cold, and snakes aren’t out,” Brawn said.

The students learn about the cultural history of South Africa and the politics of wildlife conservation. They also visit rehabilitation clinics and talk with wildlife veterinarians. “Wildlife rehabilitation is a big issue in South Africa because poaching and other illegal persecution of wildlife can lead to animals’ being injured,” Brawn said.

At Kruger the students meet a staff member in charge of managing the elephant population and learn about some of the challenges being faced. “In many areas there are too many elephants, and in other areas too few,” Brawn said. “The reserves used to put out water holes to attract the elephants, but elephants change the landscape. They knock over trees, eat everything, and change the forest structure. Now managers keep the park as natural as possible rather than artificially concentrating the elephants around a water hole.”

After the trip the students write papers reflecting on their experiences. Brawn asks them to describe their three biggest surprises in terms of resource management, wildlife behavior, and culture. A lot of the students say that the trip was transformative.

“South Africa is a developed country; they have McDonald’s. But when you’re driving down the road in the U.S., you don’t see elephants or leopards.”

Even though students may have seen these species in zoos, there’s no comparison to observing animals in their natural habitat, Brawn said.

“Animals in zoos are very docile. In the wild, they are not waiting to be fed; they have to find their next meal. We saw a jackal one day who had been injured by a hyena. The students felt sorry for it, but that’s life. Plus, outside a zoo, you may be potential prey. That’s energizing.”
ACES partnership in Sierra Leone

Isalia Ramirez admits that when she set off for Koribondo, Sierra Leone, she was scared. Being the only “foreigner” in the village didn’t help. But five weeks later, she left a stronger and more confident person.

“For this agricultural and consumer economics (ACE) major, choosing to study abroad at Njala University was easy. “I want to work in international development,” Ramirez said. “This program provided hands-on experience to get me started.”

Experiential learning is the core of the International Development and Agribusiness Program (IDAP) in Sierra Leone, said program coordinator Oliver Ferguson.

“Students study international development in English while living in a rich West African culture,” Ferguson said. “It’s easy for applicants to think about going to sub-Saharan Africa to serve others, but they don’t always recognize what they will receive in return.”

Participants spend nearly five months studying agribusiness, development, entrepreneurship, and cross-cultural teamwork.

“Our students experience Africa, but not in a bubble as expatriates,” said Paul McNamara, IDAP director and associate professor of ACE. “They live and study on a campus with African students, working together as peers.”

Students take courses, interact in an experiential learning class, and complete a five-week internship. They learn how to work across cultural differences and communicate more effectively.

The client for last spring’s experiential learning class, the ADM Institute for the Prevention of Postharvest Loss, commissioned students to analyze the rice supply chain, from field to consumer, and determine how much grain was lost in the process.

“The students visited farmers in rugged and remote places,” McNamara said. “It was a great experience for them to return to Njala and present their final report at a public forum.”

As an “executive in residence,” ADM Cocoa’s Mohamadu Kane, general manager of the company’s West Africa division and a U of I alumnus, was a valuable resource. Kane presented a lecture at Njala about the West Africa cocoa industry. He and the class traveled to the cocoa region, where students learned about the crop and how ADM engages with small farmers in West Africa. He taught students how the small-holder farmers, buyers, and processors think and what they care about.

“It was amazing,” McNamara said. “ADM’s financial support was invaluable, and their desire to expand their global presence provides many opportunities for students.”

IDAP offers participants a mix of opportunities. McNamara said he wants students to understand that ag business and international development intersect at many levels, and people are needed at all of them.

Emily Carroll, an ACE senior, taught business skills to young people from rural agricultural villages during her internship.

“I became more aware of the values I hold because I grew up in America,” Carroll said. “While being in Sierra Leone made some of my beliefs stronger, it also made me more open-minded.”

Ferguson added that the program benefits not only Illinois students, but those of Njala.

“We want to give them a chance to expand their horizons,” he said. “And for ADM, this is an opportunity to import talent and use local talent to accomplish its goals and objectives. Everyone wins in this scenario.”

This program received support from the Food and Agribusiness Management Program and an Arlys Conrad International Teaching Enhancement Grant. For information on how you can support programs like this one, contact the ACES Office of Advancement (217-244-3980, acesadvancement@illinois.edu).

In the mid-1960s, under a contract from the U.S. Agency for International Development, ACES helped develop Njala University in Sierra Leone. U of I professor of agricultural economics Bill Thompson was instrumental. Years later, a 10-year civil war resulted in mass destruction to the school. More than 80 percent of its facilities were destroyed, a number of faculty were killed, and many others left the country.

Since then, Njala has rebuilt and grown more than ever, said Paul McNamara, IDAP director. ACES has been coordinating programs with Njala for the past five years. “We invest in this program because it benefits our students, faculty, and programs and the students of Njala,” he said.
Recent changes in industry demands have created an “interesting” time in meat science, according to researchers in the field.

“For the last 20 years, the value of the carcass has been driven by steaks and chops from the middle of the animal,” said Anna Dilger, an assistant professor in meat science. “Now in the pork industry, what has become really important is the belly—because that’s where you get bacon, and bacon is everywhere.”

On-farm practices in pig production, including alternate ingredients being added to pork diets as corn becomes more expensive, have affected the amount and quality of fat in the pork carcass. “Producing very lean pigs has caused issues in the amount and quality of bacon we can get from a pork carcass, and it has become a really big deal,” she said.

Leaner pigs have also prompted more study into other affected processed meats, such as sausage, bratwurst, and hot dogs. “We’re interested now in how these changes in the pork industry trickle down and cause issues for the meat industry. There are good reasons the changes have happened, because on-farm practices develop for efficiency and profitability, but our job is to push back a little bit, or deal with what we’re being given and continue to deliver a high-quality product,” Dilger said.

Dustin Boler, an assistant professor in meat science, said research done in the program’s USDA-inspected slaughter and processing facility uses input and questions straight from meat processors or producers, often alumni who are now industry professionals.

“An overriding theme is evaluating on-farm production practices and how they influence the eating quality of fresh and processed meats. We’re looking at interventions to take the belly and make it better so we can get bacon that performs the same in the skillet and has the same eating satisfaction when you enjoy it at breakfast,” he said.

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Celebrated cow

Early in the 20th century, the U of I boasted a legendary cow. Illini Nellie, a Brown Swiss, produced world-record amounts of both milk and butterfat. The cow, originally registered as Mc John’s Nellie M., lived a highly publicized life during her years on the university dairy farm. Illini Nellie was brought to the U of I in 1927 and produced, on average, 50.6 pounds of milk every day of her productive life—10 years, 6 months, and 13 days. This amount could have provided a daily quart of milk for some 23 families over the decade-long span.
New wiring and network upgrades at the Dixon Springs Agricultural Center, an ACES research facility located over 200 miles south of the main campus, will allow 24-hour video access to the cattle housed at one of the country’s largest beef research centers.

Video cameras newly installed in the cattle barn will give U of I faculty, researchers, students on campus, and others beyond campus the next-best experience to being on site to observe procedures such as calving or vaccinations being administered, all in real time, said Frank Ireland, an animal science researcher and superintendent of the research facility in Simpson, Illinois.

“The DSAC animal science program, particularly beef cattle research, is one of the largest in the country, and Dixon Springs is the biggest location because of the available acreage of land,” Ireland said. “There’s a need for it because fewer and fewer places have the number of cattle that we do.”

There are currently 1,400 to 1,500 head of cattle in the U of I system, with 850 to 900 of those at Dixon Springs. The center spans 5,000 total acres, facilitating research in animal science, agronomy, and natural resources and environmental sciences.

Looking beyond the opportunities for U of I research, Ireland said the vision is to allow access to the broadcasts from the cattle barn not only to the school’s researchers, students, and veterinarians but to other universities and programs. “Some colleges have teaching facilities with no live animals, and livestock judging is often done online using pictures,” he said.

He also noted the benefit of such applications as using the cameras to help in discussing and diagnosing illness or injuries in the cattle with off-site veterinarians.

How does a farm girl from Sheldon, Illinois, become a translator to Portuguese-speaking visitors in the international tent at the nation’s largest outdoor farm show? Five trips to study abroad during her first two years of college didn’t hurt.

Ashley Nagele said that in her three-day translation gig at last summer’s Farm Progress Show, she actually served more as an ambassador. “I gave a lot of directions, and because of my knowledge of agriculture, I could answer more in-depth questions.”

Nagele’s study abroad trips became progressively longer—a two-week meat-judging contest in Australia; a month working on a farm in New Zealand; a winter break tour of five African countries; and a three-month stint in Panama working in an in vitro fertilization lab. The trip to Panama is where she fell in love with the Portuguese language.

“I learned a lot of technical vocabulary because my co-workers spoke Spanish and Portuguese,” she said. “I think the key to learning languages is to shed your pride and be vulnerable. For example, one time I tried to say ‘I lost 15 pounds’—but first I said I’d lost ‘15 books,’ and then ‘15 freedoms’ because the words are very similar.”

What’s next? Nagele will spend a semester in Brazil, where she’ll put her Portuguese to use full-time.

Nagele believes her unique skill set combining science, economics, and non-English languages will make her more marketable. “A lot of people can speak other languages, but my ACES background in animal sciences means that I could be the one, for example, to teach new in vitro techniques to technicians in all of Central and South America.”

“Cattle cams” offer long-distance learning

Blending passions for science, economics, and Portuguese

Blending passions for science, economics, and Portuguese
Brazil’s dilemma: Abundant grain, inadequate storage

A tropical climate that allows for year-round farming would seem to be a tremendous economic advantage, but for corn and soybean farmers in the Brazilian state of Mato Grosso, it also poses a problem—an abundance of grain followed by about a 10 percent postharvest loss, due in part to a lack of storage.

“There is a 34 percent undercapacity of soybean storage, and the situation is aggravated by the rapidly increasing production of second-crop maize,” said agricultural economist Peter Goldsmith. “The worst situation occurs in northern Mato Grosso, where there is clear evidence of a shortage of storage, particularly private and cooperative, as grain production rises in the state.”

The research project was the first to employ GIS software to map the coordinates of commercial, cooperative, and private grain storage facilities in Mato Grosso.

“Tropical regions of the globe will be producing more and more of the world’s food, so helping farmers in developing countries such as Brazil create more efficient harvesting, transporting, and storage is a step toward ensuring that there will be enough grain to feed and fuel the world.”

Wetlands more cost-effective in nutrient removal

Removing nitrogen from the environment “the natural way” by creating a wetland offers long-term pollution control and other environmental benefits, and it is more cost effective than upgrading a wastewater treatment plant to remove excess nutrients, such as nitrogen and phosphorus. But does it benefit society overall to offer landowners multiple payments to set farmland aside to create wetlands?

“This is a big issue in the design of markets for ecosystem services,” said U of I environmental economist Amy Ando. “A wetland does a lot of things. It will filter out nutrients, but it also creates habitat for waterfowl, and it might sequester carbon. The cost is large enough that in some cases no single payment might be enough to convince a farmer to do it, but if farmers get paid for the full value to society of all three benefits, then they might be willing.

“But there’s an almost violent debate among scholars and environmental groups and people who are trying to get these markets into place about whether farmers should be able to stack payments. We were trying to be agnostic and just ask, What effects would stacking have on market outcomes?” she said.

The study Ando worked on in Bureau County with U of I colleague Nicholas Brozović and former graduate student Adam Lentz analyzed the amount of land needed to reduce nitrogen pollution, data on the costs of actual wetland restorations, and other factors, including the opportunity costs to landowners from no longer farming new wetland areas.

“Ideally we want to pay farmers to create a wetland that they would not have done anyway,” Ando said. “But in some cases, they might not need the extra incentive and would have been happy to do it for the nitrogen payment alone. In our study area, we found that allowing multiple payments may or may not make society as a whole better off, depending on the details of the policy situation.”
A career in finances about more than just money

Jake Kuebler ’08 had an epiphany while taking John Braden’s class on personal financial planning, one that set him on a completely new career track.

“I thought it was going to be a life skills course, like what is a mortgage and how do you get one,” Kuebler said. “Instead I found out about the whole profession of personal financial planning, and I wound up taking every course that was offered in that area.”

At 27, Kuebler is a Certified Financial Planner (CFP) and co-owner of Bluestem Financial Advisors in Champaign, Illinois.

“What attracted me to financial planning was that it has both a technical side and a personal side,” he said. “What’s kept me in the field is that repetition bores me, so the fact that every client has a unique set of circumstances makes it fascinating.”

Kuebler has found that getting to the decision-making stage with a new client takes about 6 to 10 meetings over three to six months. Sometimes the answer to a borderline financial situation seems obvious, he said, but the client needs to arrive at the solution themselves. “Instead of simply advising, for example, ‘You need to sell the second house,’ I use the meetings to review cash flow and then slowly lead the client in that direction. I ask questions like ‘In the event of something happening, how do you see yourself or your spouse adjusting to this set of circumstances?’ and then help them move toward a decision.”

Kuebler is passionate about fee-only advising, a model of financial planning championed by the National Association of Personal Financial Advisors, in which he is actively involved, working with other young professionals in the business.

Fee-only advisors don’t sell products, such as insurance. They don’t earn commissions like a broker does on investments. And they don’t pay for referrals or take compensation for referrals.

“Fee-only advising reduces conflict of interest,” Kuebler said. “We make decisions based not on which product would compensate us the most, but on which best fits the client’s need.”

While some financial planners may seek clients with $1 or $2 million to invest, Kuebler charges a retainer, whether the client has $50,000 or $2 million. He believes that he is fairly compensated, and that business model also allows him to pursue a clientele that many advisors are less interested in considering—young professionals.

“Clients tell us all the time that we make a big difference, but we can see it for ourselves when they meet their goals. We’ve helped them buy their first home, they’ve had their first child—we’re focused on the financial side, but it’s rewarding to see all of those life events falling into place and know that in some small way we’ve helped ease that process.”

A closer look

• The ACES financial planning program ranks in the country’s top 25.
• The program has 78 students this year.
• Students work with industry practitioners.
• Coursework includes retirement and benefit planning, finance, personal financial products, case studies in financial planning, and taxes.
• Students can take the Certified Financial Planner accreditation exam upon graduation.
• The program has an active student club.

For more information, visit ace.illinois.edu/undergrad/concentrations/fp.
If you rely on frozen veggies in the winter, you may be alarmed to learn that frozen broccoli lacks the ability to form sulforaphane, the cancer-fighting phytochemical in fresh broccoli. Don’t worry: U of I researchers have demonstrated how the food industry can restore the frozen vegetable’s health benefits.

“The problem begins when soon-to-be-frozen broccoli is blanched, or heated to high temperatures, to inactivate enzymes that can cause off-colors, tastes, and aromas during the product’s shelf life,” said Elizabeth Jeffery, a professor of nutrition.

The extreme heat destroys the enzyme myrosinase, which is necessary to form sulforaphane, the powerful cancer-preventive compound in broccoli, she said.

“In the three commercially frozen broccoli samples we tested before and after cooking, there was very little cancer-fighting capability before the frozen broccoli was cooked, and none afterward,” said Ed Dosz, a graduate student in Jeffery’s lab.

To kickstart the chemical reaction they needed, the researchers decided to expose frozen broccoli to myrosinase from a related cruciferous vegetable.

When they sprinkled 0.25 percent of freeze-dried daikon radish—an amount invisible to the human eye and undetectable to our taste buds—on the frozen broccoli, the two compounds worked together to form sulforaphane, Dosz said.

One question remained: Would sulforaphane survive the heat of microwave cooking? “Yes!” Jeffery noted. “The radish enzyme was heat-stable enough to preserve broccoli’s health benefits even when it was cooked for 10 minutes at 120 °F.”

Consumers can also team cooked frozen broccoli with raw radishes, cabbage, arugula, watercress, horseradish, spicy mustard, or wasabi to give the vegetable’s bioactive compounds a boost, she said.
Incarcerated men know they will need better financial skills to succeed when they’re released from prison, but most distrust “the system,” are more open to educators from outside their facility, and believe they need personal rather than classroom instruction, said Angela Wiley, a professor of applied family studies.

“Most of us are in here because of money,” noted one man who was interviewed.

Many of the men said they want to learn to budget and manage money because they anticipate being self-employed upon their release, but “I really feel like a moron in that area, and I don’t know where to start asking questions,” one man said.

More than half were thinking about going into construction and real estate—buying houses, fixing them up, and selling them. One wanted to start a business using his cooking skills, and another to freelance as a tattoo artist.

“Many jailed men don’t have the formal education and specific skills to be viable in the traditional job market. It makes sense, if they’re thinking about starting a business, to teach them basic bookkeeping, how to fill out tax forms, those kinds of things,” Wiley said.

Despite their interest in financial education, many of the men said that there was not much opportunity because “the criminal justice system is not about rehabilitation.” Only two men did not express distrust of the system and the instruction offered within it.

Wiley wants to see programs targeted to meet the needs of this very vulnerable population.

“If we’re not helping offenders in ways that will enable them to be successful later on the outside, we’re doing them and society as a whole a disservice,” Wiley said.
Animal welfare has long been a hot-button issue, particularly in industry and science. The Animal Welfare and Environment Systems (AWES) laboratory in the Department of Agricultural and Biological Engineering (ABE) focuses on improving animal husbandry to help solve problems in animal housing, primarily for commercial agriculture and research laboratory settings.

ABE assistant professor Angela Green and Richard Gates, a professor, are the lab’s faculty team members. “Our team is multidisciplinary,” said Gates, “bringing together scientists and students in engineering, animal science, veterinary medicine, and related fields.”

In addition to ABE undergraduate and graduate students, the team has faculty collaborators in ABE, Natural Resources and Environmental Sciences, and Animal Sciences. Undergraduates, graduates, and visiting scientists from China, Brazil, and Belgium also contribute to the multidisciplinary makeup of the lab.

The team members design and construct a variety of equipment used in their research. A custom-built environmental preference chamber is used to measure behavioral feedback from poultry and small pigs. Four interconnected compartments control temperature, relative humidity, and aerial contaminants such as atmospheric ammonia. A year-long study on the effect of ammonia laying hens was recently completed.

Other research projects include a ruminant emission measuring system (REMS), which monitors and analyzes methane emissions from beef cattle fed different diets, and a study on swine transport, measuring interior conditions such as bedding conditions in the winter (does the bedding freeze?) and the heat stress index in the summer.

“Our goal is to develop scientific tools that will measure what’s best for an animal’s welfare,” Gates concluded.
The desire to make a difference drives Shauna Somerville's research in plant and microbial biology. She and her husband, Chris Somerville, are motivated to contribute to the advancement of biofuels and food production in an ecologically sensitive manner.

Somerville (Ph.D. ’81) is a research professor in the plant and microbial biology department at the University of California, Berkeley. She also holds a research position in the Energy Biosciences Institute, where Chris is director.

She received her undergraduate and master's degrees from the University of Alberta while Chris completed his Ph.D. After both finished up, they moved to Paris to study for three months while determining where they could best make a contribution in plant biology. They spent their mornings in the library and their afternoons sightseeing and talking about how they would apply their knowledge to influence the world together.

Several names came up during their conversations, including Bill Ogren at the U of I. The two were interested in his work and thought they could learn a lot from him, so Shauna wrote Ogren asking whether she could do a Ph.D. and Chris work as a postdoctoral researcher in his lab.

During her time at Illinois, Shauna focused on genetics, applying her knowledge through plant breeding. “I found that plant breeders tended to be more interested in the net outcome rather than the plant's underlying mechanism, and I didn’t find that very satisfying,” she said. She switched to plant physiology and plant biochemistry with Dr. Ogren, hoping to gain deeper insight into what was going on inside the actual plant.

Shauna said that scientists were just starting to bring molecular genetic tools to work in plant biology, and biologist Paul Ehrlich released The Population Bomb. “He was one of those people back in the mid-’70s who warned that humans had to be careful about how much demand they made on the Earth. He was someone to raise the flag and say that we should move forward cautiously.”

The book motivated both Shauna and Chris to make a difference in food and biofuels production.

“Since leaving Ogren’s lab, I’ve moved into plant pathology, where I’m working on diseases in plants,” she said. “I keep hoping that something we discover will really make a difference out there in the real world and will help us address some of the challenges that we face going forward.”

Somerville’s primary interest today is the plant cell wall and its role in fighting plant pathogens. She described the wall as the first barrier that pathogens encounter.

“It’s on the basic side, but I feel that we’re learning about the composition of the cell wall and what kinds of crops to utilize for biofuels. There’s a lot of talk about making changes in the cell wall to make it more digestible during processing, but there’s a balance we’ll have to strike in designing the optimal plant and making sure that it’s disease-resistant as well,” she said.

Jody Endres, ACES professor of natural resources and environmental sciences, said, “Shauna’s drive and commitment to improving the lives of others through sustainability and science are truly inspiring. She is a wonderful role model for young women in science.”

Shauna’s best advice to students is to avoid preconceived ideas and take advantage of every opportunity.
Yuji Arai of the Department of Natural Resources and Environmental Sciences received a Ph.D. in environmental soil chemistry from the University of Delaware. **Areas of interest:** environmental soil chemistry and understanding the predominant and fundamental chemical reactions of nutrients, metals, and radionuclides at the mineral–water interface in soils and sediments. Such knowledge greatly enhances the ability to understand contaminant speciation and predict the fate, transport, and bioavailability in terrestrial water environments. **Tell us something no one knows about you.** My students say I am a speed walker.

Dustin Boler of the Department of Animal Sciences received a Ph.D. in animal sciences with a specialization in meat science and muscle biology from the University of Illinois. **Areas of interest:** how on-farm production techniques influence fresh meat quality and further processed product characteristics. **What piqued your interest in the field you’re now studying?** I first developed an interest in the meat industry during high school while participating in the meat-judging career development event in FFA. That interest grew during my employment with Tyson Foods.

Jonathan Coppess of the Department of Agricultural and Consumer Economics received a juris doctor degree from George Washington University Law School. **Areas of interest:** agricultural policy and law, including farm support, crop insurance, conservation, renewable energy and biofuels, and biotechnology and related issues, including the political process for creating and implementing agricultural policies. **What piqued your interest in the field you’re now studying?** I trace my interest in these issues to having grown up on a family farm, and especially to my grandfather who farmed and was very interested and involved in politics. When I was young, he was elected county commissioner for a term, and we talked politics and policy quite a bit over the years. For the last eight years, I’ve been working in Washington, D.C., both in the Senate and at USDA.

Megan Dailey of the Department of Animal Sciences received a Ph.D. in behavioral neuroscience from Georgia State University. **Areas of interest:** how our bodies sense the nutrients we eat; the mechanisms responsible for cellular adaptation in the intestine, finding a therapy for such intestinal disorders as Crohn’s disease, irritable bowel syndrome, and cancer. **What hidden treasure have you found on campus?** The faculty members here are passionate about their jobs and creative in their research endeavors. I am impressed by the continuing efforts of this university to improve teaching and enhance the student learning environment.

Todd Henry Kuethe of the Department of Agricultural and Consumer Economics received a Ph.D. in agricultural economics from Purdue University. **Areas of interest:** measuring and forecasting aggregate agricultural asset values, the impacts of policy on agricultural asset values and farm profitability, economic decision-making for non-operating farmland owners, spatial modeling of real estate markets, and economic analysis of large-dimensional data systems. **Tell us something no one else knows about you.** My dream job is to be a television writer for a sitcom or procedural drama.

Nathan E. Schroeder of the Department of Natural Resources and Environmental Sciences received a Ph.D. in plant pathology at the University of Wisconsin–Madison and was a postdoctoral fellow in genetics at Rutgers University. **Areas of interest:** how nematodes sense and respond to environmental stress. **What piqued your interest in the field you’re now studying?** My interest in nematodes was love at first microscopic sight.

Yuji Arai

Megan Dailey

Todd Henry Kuethe

Nathan E. Schroeder
Field and Furrow supports Turner Project

In September 2012, the Turner Hall transformation project was officially launched with a gala at the home of Dr. Larry Hageman (B.S. ’78, Agriculture Science) in Rochelle, Illinois. Last fall, Hageman hosted a dinner in the ACES library during homecoming for Field and Furrow alumni. Attendees were welcomed by ACES leaders and the Turner Hall committee members, and student Field and Furrow members gave tours of planned renovations.

Alumni from across the generations enjoyed connecting and reconnecting as the club celebrated 78 years on the Urbana campus. Volunteers including Mark and Becky Baxa, Julie Quick, Bill Kirk, Frederick Groya, Mark Parrish, Steve Scates, Jerry Brookhart, and Larry Hageman have spent months researching and reaching out to club officers dating back to the 1950s, with the goal of strengthening ties to the college and to the club. The Turner Hall project is nearing the halfway mark toward the $5-million fundraising goal for renovating classrooms and teaching laboratories.

Lanans leave a legacy for Turner Hall

Growing and nurturing a good life were central to Howard and Evelyn Lanan as they spent 62 years together on their farm in Kingston, Illinois, just north of DeKalb. The pair, with degrees from Northern Illinois University and Iowa State University, were deeply involved as leaders in their community and church and as hosts for exchange students from around the world. Their appreciation of both agriculture and home economics and of the role of a land-grant university led them to establish the Howard T. Lanan and Evelyn M. Lanan Endowment for Excellence in the College of ACES. Their interest in supporting the teaching of soils and soil science will allow five years of accumulated income from the endowment to support the Turner Hall Transformation Project, which includes renovation of the soils teaching laboratory.
Gifted communicator Lulu Rodriguez is the new director of the U of I agricultural communications program. She joined the faculty last fall to lead the innovative dual academic program offered by the College of Media and the College of ACES.

Rodriguez brings a strong background in agricultural and rural communications in the United States and internationally. A graduate of the pioneering development communication program at the University of the Philippines in Los Baños, she gained initial experience communicating with rural families about agricultural research in seven years with the applied communications unit of the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development, which is the Philippines national research planning and monitoring body. Her experience there included four years as division head.

Rodriguez has worked in the United States since 1985, when she began graduate studies in communication at Cornell University. After completing her master’s degree, she earned a Ph.D. in agricultural journalism/mass communications at the University of Wisconsin.

In 1993 she joined the faculty of what is now the Greenlee School of Journalism and Communication at Iowa State University, from which she comes to Illinois. Rodriguez served for eight years as director of graduate education and 10 years as head of the visual communication emphasis of the journalism and mass communication major. She was also instrumental in developing the proposal for the school’s first doctoral program.

An exceptional educator, Rodriguez was one of five faculty recognized as Master Teachers in the College of Liberal Arts and Sciences at Iowa State University. The award honored her use of unique methods to enhance student learning in courses ranging across multimedia production, visual communication, strategic communication, risk perception and communication, and communication research methods. Her dedication and skill in advising students led to her being named 2013 Outstanding Mentor for LAS graduate students at Iowa State.

Rodriguez’s research agenda parallels her teaching endeavors, illuminating how scientific discovery is communicated and how citizens can be informed to make effective decisions about complex issues that involve science and risk. It has included grant-based research projects totaling more than $5 million.

Rodriguez will have a faculty appointment in the ACES Department of Natural Resources and Environmental Sciences.

“Professor Rodriguez brings exceptional skills in collaborating across disciplines and cultures,” said Jan Slater, dean of the College of Media. “She enjoys partnering across diverse disciplines and has provided communications expertise through training activities, consultancies, and other activities involving countries in nearly every region of the world.”

SAC’s 25th anniversary

The ACES Student Advancement Committee is turning 25. Founded by a passionate group of students in 1988 to serve as the student branch of the Office of Advancement and Alumni Relations, SAC encourages philanthropy, student recruitment, alumni and donor relations, and service to the college. Each spring, students interview to become members of SAC.
Highlights from Salute to Ag Day

Billy Hatfield, a student in agricultural leadership and science education, served up a breakfast sandwich to K.T. and Betty Wright, whose extended family received the 2013 ACES Alumni Association’s Family Spirit Award. ACES alumni gathered under the big tent to celebrate agriculture before the game against the University of Cincinnati in September.

Orion Samuelson interviewed the winners of the Orion and Gloria Samuelson Scholarship in the College of ACES, including (from left) Kurt Hansen, Madelyn Walters, Madeline Milnamow, and Westin Montavon. Awardee Jayne Godfrey is not pictured.

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Invest in ACES: Leave a Legacy

It’s no secret that the University of Illinois and the College of ACES have played important roles in the lives of many. It’s a great testament to the university that many friends and alumni choose to give back in the form of a legacy gift.

The U of I has made major strides toward fiscal health through these legacy gifts, which are destined to become even more critical in light of reduced public funding. Will you join us in this important endeavor?

For more information, contact the ACES Office of Advancement at 217-333-9355.
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