Illinois Livestock Industry Strengthened through Strategic Research

Illinois’ livestock industry has a total economic impact of $3 billion and directly employs about 30,000 individuals. Although the industry has experienced decline over the past 30 years, recent data indicate that the rate of decline has slowed, and, in fact, many new hog, dairy, and cattle operations are being built or expanded throughout the state. To assist in strengthening Illinois’ livestock industry, C-FAR launched a strategic research initiative (SRI) in 2003 called Illinois Livestock Integrated Focus Teams (I-LIFT). Michael Hutjens, professor of animal sciences at the University of Illinois at Urbana-Champaign (UIUC), provides leadership for the SRI.

“Increasing livestock numbers has been a priority for the major commodity groups in Illinois, in which we have worked cooperatively through the Illinois Livestock Development Group (ILDG),” said Jim Kaitschuk, executive director of the Illinois Pork Producers Association. “Livestock is essential for the future viability of agriculture and rural communities in our state. This research will compliment the ongoing efforts of the ILDG and provide additional knowledge and resources to support a growing livestock industry in Illinois.”

The I-LIFT SRI is comprised of four focused initiatives investigating livestock facility siting, use of distillers grains in livestock diets, integration of animal grazing systems into a conventional crop rotation system, and animal identification for enhanced food quality and monitoring livestock health. Recent reports submitted by researchers indicate the following progress.

**Livestock Facility Siting in Illinois**

The objectives of this initiative are to access compliance with state regulations by current Illinois livestock facilities, determine reasons and obstacles for noncompliance, and assist livestock producers in improving compliance and maintaining positive relationships in their local communities and beyond.

Researchers completed an on-farm survey of Illinois swine farms to access their manure nutrient management plans and practices. Survey findings were incorporated into an Illinois livestock producer certification program. During the past year, 11 manure management workshops...
Greetings

C-FAR Research: Access and Transparency

A very interesting piece of legislation was approved by the U.S. House of Representatives this summer regarding “free public online access” to publicly-funded research findings. In general, this legislation directs that certain publicly-funded research findings be available for public access—not only by consumers, but also by fellow researchers for the further advancement of scientific discovery. For those familiar with C-FAR research, funded by the State of Illinois, this federal legislation just now being considered is hard to understand. Why? Because C-FAR has provided such access since the organization’s founding in the mid-1990s. Although this federal legislation’s focus is on research conducted through the National Institutes of Health, its comparison to C-FAR’s research reporting procedures is noteworthy.

The bottom line: C-FAR’s operating protocols have always embraced this type of access and transparency.

Although we strive for continual enhancements to our C-FAR reporting procedures, the fact is that the State of Illinois and C-FAR membership have clearly sought for C-FAR–funded research programs to have an extremely high level of transparency, access, and accountability. And we do.

Our reporting procedures are extensive. They include the following:

- Annual documentation of every research initiative funded
- Availability of progress reports for continuing research
- Annual financial accounting for all research initiative expenditures
- Final reports for every C-FAR–funded research initiative
- A standing invitation for further information if desired, which we, C-FAR, can facilitate with the respective researcher

I do not contend that our research-reporting procedures are perfect; they are not. But, the principles by which we are driven are highly laudable and in the best interest of the public. The credit for the foundation of these principles rests with C-FAR’s initial partnership established with the State of Illinois and the subsequent development of programs by the C-FAR membership and research partners. State of Illinois officials and C-FAR’s membership and research partners can be extremely proud of our high commitment to research reporting since our inception—more than ten years before a discussion of the same takes place at the federal level.

If you haven’t done so in a while, please visit our website’s research section at www.ilcfar.org/research/index.html. I trust you will be impressed with the breadth of reporting measures. We remain committed to providing accountability, transparency, and public access. Illinois did not need special legislation to make this happen—it came about because of the State of Illinois’ confidence in what C-FAR promised, and the subsequent delivery of this promise by C-FAR members and research partners.

Kraig A. Wagenecht
Executive Administrator
Livestock Facility Siting in Illinois

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were held throughout Illinois reaching over 300 producers, educators, and other agricultural professionals. A manure nutrient management planning tool is available at https://webs.extension.uiuc.edu/immp/. Future work will include assisting livestock producers in writing their comprehensive nutrient management plans so they can take advantage of the new round of USDA Natural Resources Conservation Service incentive payments.

Using Illinois By-Product Feed in Livestock Feeding

As ethanol production increases in Illinois, byproducts are becoming more abundant. I-LIFT has developed an interactive website at http://ilift.traill.uiuc.edu/distillers that provides a wealth of information on distillers grains and their utilization in swine, dairy, and beef cattle diets. Ethanol plants in Illinois, and within a 100-mile radius of the state, are listed with contact person, yearly production of distillers grains, products available, pricing structure, nutritive value/specifications, minimum load, and respective website (if available). Researchers are continuing efforts to inform Illinois’ livestock producers about the utilization of byproducts in feed rations.

Using Illinois Forages Based on Pasture-based System

Researchers are comparing and contrasting the relative economic value of integrating grazing animal systems into a conventional short-term crop rotation system. Agronomic and economic grazing data are being collected at several locations across Illinois.

Testing indicates that the quality of forage-based, managed grazing systems is sufficient to maintain a cow-calf enterprise. Enterprises involving lactating ewes and dairy cows or growing calves may require energy supplementation to support desired performance. Economic data summarization is ongoing, with preliminary results suggesting that complete utilization of annual forages is required to compete with perennial forages. Harvesting excess forage as hay has been shown to increase grazing costs due to reduced grazing days, however, additional studies are needed. Researchers have also found that matching animal stocking rate to forage supply efficiently utilizes forage while minimizing quality loss and harvesting costs. Pasture data collection is expected to conclude this fall with project results being summarized and disseminated in 2008.

Animal Identification for Enhanced Food Quality and Monitoring Livestock Health

With emphasis from the USDA to trace animals from farm to market, developing a simple, effective method for animal identification has become a state and national priority. This research initiative has expanded into a statewide program with support from the Illinois Department of Agriculture, the Illinois Milk Producers’ Association, and the USDA premise identification program.

Previous work confirmed that ID devices that also measure body temperature can track fever as an indicator of animal disease in an experimental setting. Researchers have since examined temperature measurement as a predictive aid to producers for disease incidence in animals under natural conditions, specifically around calving in dairy cattle. Results indicate that the sampling frequency needs to be increased to reliably predict a diseased animal. In addition, there are external factors such as heat stress that influence data measurement, which need to be included in any model ultimately used to evaluate animal health. This past year, the ID devices were evaluated in steers during controlled heat stress with an experimentally induced fever. Those data suggest that individual animal response is important when developing models that identify the presence of disease.

“With the renewed interest in finding ways to improve cattle feeding and other aspects of production...
in Illinois, the information and findings from this project are very timely for beef producers,” said Maralee Johnson, executive vice president of the Illinois Beef Association. “More producers are taking advantage of better utilization of pasture ground through rotational grazing of some sort as well as extending the grazing season by interseeding turnips, rye, and so forth in standing corn for feeding after harvesting.”

“C-FAR facilitates dialog between livestock producers and other food and agriculture stakeholders to prioritize strategic funding of limited research dollars. Increasing public funding for C-FAR will enable our excellent research institutions in Illinois to achieve even greater success delivering the kind of solutions needed in the ever-changing high-stakes world of agriculture and food production,” said Molly Ann Godar, C-FAR agricultural production systems working group chair and president of the Sangamon County Pork Producers.

Illinois’ grape and wine industry has experienced substantial growth since the late 1990s. The state’s current 72 wineries and 450 vineyards covering 1,100 acres produce 500,000 gallons of wine per year. The wine grape industry and related sectors are estimated to create more than $253 million of total economic value for Illinois.

Illinois grape growers have made significant investments to establish their businesses, investing between $7,500 and $10,000 per acre (not counting land costs) to bring vineyards to full production. Although grape growers normally realize profits seven to eight years after vineyard establishment, many vineyards start to decline in yield and fruit quality during this period. Often plant viruses and pathogenic nematodes are responsible for the gradual debilitation of grapevine health and productivity.

C-FAR–funded researchers at Southern Illinois University Carbondale (SIUC) are investigating vineyard management practices to enhance the sustainability, yields, and fruit quality of Illinois vineyards. As part of this initiative, Bradley Taylor, associate professor of plant, soil, and agricultural systems, and his colleague, Alan Walters, are examining how current vineyard management practices relate to the incidence of grapevine diseases. They are also evaluating the effectiveness of using disease-resistant rootstocks (grafted roots) to suppress disease.

“Locally grown grapes produce a unique branding and niche marketing opportunity for Illinois winemakers,” said Taylor. “The ability to control threats from grapevine diseases is crucial to the continued growth of Illinois’ grape and wine industry.”

Having completed the first year of this three-year initiative, researchers have made significant progress in characterizing both specific diseases threatening Illinois’ grapevines and current vineyard management practices utilized throughout the state. The following are highlights of findings to date.

Viruses and Nematodes Threatening Illinois Vineyards

Previously, Walters and Taylor had identified viruses responsible for the debilitation of grapevine health and productivity in vineyards from northern to southern Illinois. Many of the sampled vineyards in southern Illinois contained a mixture of two or three viruses that often exacerbated vine decline and reduced productivity. Many plant-parasitic nematodes with the potential to damage vines have also been identified throughout Illinois vineyards.

“Mixed infections of viruses have reduced vine size and crop yield by about 40% on ‘Vidal blanc’ grapevines
Research Focuses on Improving Health of Illinois Vineyards

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Growing on their own roots compared to those growing on rootstocks,” Taylor said. “‘Vidal blanc’ is an important French hybrid grape grown in Illinois because of the high quality wine it can produce. Our research found 80% of French hybrid wines in southern Illinois have mixed infections of two or more viruses. The current C-FAR project will allow growers to improve vineyard management to minimize debilitation caused by virus and nematode infections,” Taylor continued.

Survey of Illinois Vineyard Managers

A survey consisting of 43 questions was developed to measure the demographics of vineyard managers and their vineyards as well as the fundamental vineyard management practices they employ, including canopy management, pest management, ground cover management, crop load, mineral nutrition, and rootstock use. The survey was administered to Illinois vineyard managers in February and March 2007.

The survey was completed by 68 individuals representing vineyards from throughout Illinois. Survey results indicate that the majority of the state’s vineyard managers lack experience in sampling nematode populations, monitoring grapevine virus diseases, using rootstocks, and applying mineral nutrients or canopy management techniques. Forty percent (40%) of survey respondents had less than four years experience growing grapes, including 20% with two years or less experience. On average, growers surveyed anticipate increasing their vineyard acreage 60% in the next five years. This study emphasizes the importance of educational programs and services being available to assist Illinois grape growers in developing optimal management practices to improve the sustainability of the state’s vineyards.

“C-FAR funding is critical to provide management options to prevent viruses and nematodes from damaging vineyards as the Illinois grape and wine industry reaches a point where enhancing fruit quality and increasing production are essential,” Taylor noted.

“The results of Dr. Taylor’s research will be very valuable for existing and new growers in making decisions regarding grape varieties to plant,” said Bill McCartney, executive director of the Illinois Grape Growers and Vintners Association.

New Technologies Developed to Improve Ethanol Plant Water Recycling

The demand for renewable, environment-friendly fuels is spurring the construction of ethanol plants throughout the Midwest, and certainly in Illinois. As a growing number of ethanol plants are coming online, an important emerging concern is improving water use efficiency by the plants. Although the effects of ethanol production on groundwater supplies are expected to vary locally and to be affected by multiple factors such as volume used, properties of the aquifer, and other uses, some regions of the Corn Belt where ethanol plants are being sited are at greater risk for experiencing future water availability problems.

“The ethanol industry is responding to the economic and environmental need for more efficiency in both energy and water use in the ethanol production process. Many new technologies are being developed by researchers, which once tested and demonstrated will be adopted by industry,” said Wendell Shauman, former Chairman of the Illinois Corn Marketing Board.

C-FAR–funded researchers at the University of Illinois at Urbana-Champaign (UIUC) are investigating how current ethanol production processes can be improved to reduce water requirements of ethanol plants. Most ethanol plants using the dry-grind method use about four gallons of water for every gallon of ethanol produced. Researchers are investigating ways to increase the amount of water recycled during the process.

“If a plant is designed to produce 100 million gallons of ethanol, it currently uses about 400 million gallons of water per year,” said Kent Rausch, UIUC associate professor of agricultural and biological engineering, and principal investigator of the research initiative. “If we can increase the amount of recycled water from 50 to 85 percent, it will make a big difference from both economic and environmental standpoints.”

During the dry-grind production of ethanol, corn starch is fermented and converted into ethanol.

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New Technologies Developed to Improve Ethanol Plant Water Recycling

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The remaining material, called whole stillage, is centrifuged, and about 50 percent of the water is recycled; most of the remaining water is evaporated. Researchers are investigating adding membrane filtration to the process to filter the remaining soluble material, called thin stillage, and recycle additional water. The added filtration should remove impurities that build up in the water, inhibiting yeast growth and reducing ethanol yield.

Rausch and his colleagues are also investigating a modified dry-grind process that removes much of the protein, fiber, and fat from the whole stillage before the fermentation process. As a result, the thin stillage will be different, which will affect the filtration rate through the membrane. “Water use is important to the economic wellbeing of an ethanol plant, even where water is plentiful,” said Rausch. “Reducing the demand for water will improve production processes and reduce the impact on local water supplies and the environment. C-FAR support has allowed us to gather important information that will lead us toward improved processes for ethanol production and efficient water use.”

“We applaud C-FAR for addressing through the research project at the University of Illinois one of the priority research areas for the ethanol industry in Illinois, which is to manage our tremendous natural resources more effectively,” said Rodney Weinzierl, Executive Director of the Illinois Corn Growers Association.

Get to Know a C-FAR Member

John Quandt

In this edition we are pleased to feature John Quandt, a longtime member of C-FAR. John has been an Individual member of C-FAR since its inception, and he is also a representative of the Illinois Fertilizer and Chemical Association to C-FAR. He currently serves on C-FAR’s research committee and agricultural production systems working group.

“I believe it is critical to help direct more funds to higher education in Illinois. It is also critical to bring our knowledge, tempered with experience from all segments of the world of agriculture, to C-FAR,” said John.

After receiving a B.S. degree in animal science from Southern Illinois University Carbondale, John produced hog seed stock and was employed as a buyer for a packing company. For the past 35 years, he has been a partner and general manager/CEO for Illinois Valley Supply LLC, an agronomy input retailer. He also counsels Illinois farmers as a Certified Crop Advisor.

John has been a dedicated volunteer for a variety of agricultural organizations. He has been a member of the American Yorkshire Club and the Illinois Pork Producers Association. As a member of the Illinois Fertilizer and Chemical Association, John has served on its board of directors, and he was president from 1995 to 1996.

Providing leadership and service to his community, John has contributed his time serving as a 4-H leader, 4-H Livestock Sale Committee member, Greene County 4-H/Extension successful referendum president, Carrollton Lion’s Club member and president, Greene County Rural Water board member, and Our Redeemer Lutheran church officer and class teacher. He has been honored as an Outstanding Lion and was inducted into the Illinois 4-H Hall of Fame in 2006.

John and his wife, Bea, have been married for 44 years and live in Carrollton. They have two children, David and Lara, and four grandchildren.

“John is a sterling example of a steadfast, dedicated, and contributing member of C-FAR,” said Kraig Wagenecht, executive administrator. “The combination of John’s professional experiences, highly meaningful engagement in research discussions, and his sincere and demonstrated belief in C-FAR’s mission has resulted in C-FAR being a tremendous beneficiary.”
**Water Quality Nutrient Standards Forum**

Register today! A special forum highlighting C-FAR water quality research will be held at the University of Illinois at Springfield on October 23 from 9:00 a.m. to 3:45 p.m. This unique opportunity will allow you to:

- Better understand factors affecting the quality of Illinois’ rivers and streams
- Learn how this research is being used to develop the state’s nutrient standards
- Interact with C-FAR–funded scientists

Registration is due by Tuesday, October 16. For more information and to register, visit the C-FAR website at www.ilcfar.org, call C-FAR at 217.244.4232, or send an email to gfc@uiuc.edu.

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**Websites to Watch**

**C-FAR**
www.ilcfar.org
Your headquarters for C-FAR news and information on funded and completed research.

**NAT TOOLS FOR GOOD HEALTH**
nat.crgq.com
A source for analyzing diet and food choices.

**ILLINOIS CENTER FOR SOY FOODS**
www.soysfoodsillinois.uiuc.edu
A resource for consumers on soy foods and nutrition.

**FARM.DOC**
www.farmdoc.uiuc.edu
Provides producers and other agricultural professionals with decision-making information and analysis tools.

**MARKETMAKER**
www.marketmaker.uiuc.edu
An interactive mapping system that locates businesses and markets of agricultural products in Illinois, which provides an important link between producers and consumers.

**ALTERNATIVE CROPS FOR ILLINOIS**
www.sws.uiuc.edu/data/altcrops
Helps producers identify and find information on potential alternative crops.

**ILLINOIS IPM ONLINE**
www.ipm.uiuc.edu
An environment for learning about integrated pest management.

**ILLINOIS WATERSHED MANAGEMENT CLEARINGHOUSE**
www.watershed.uiuc.edu
Helps groups create and implement a plan to address local watershed issues.

**ILLINOIS TRAILL**
www.traill.uiuc.edu
Organizes livestock research, information, and expert services.

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**C-FAR Day at ISU**
**Showcasing C-FAR Research**

Join us for C-FAR Day at Illinois State University! On November 15, C-FAR members will have the opportunity to visit with ISU researchers at the university’s farm at Lexington and hear firsthand about C-FAR–funded research taking place at the university. C-FAR Day is held each year to allow members and C-FAR–funded researchers to come together to share ideas and engage in discussions regarding C-FAR research. Details will be mailed to members prior to the event.
calendar
2007–2008

October 23  Water Quality Nutrient Standards Forum (Springfield)
November 7  Board of Directors Meeting (Urbana)
November 15 C-FAR Day at Illinois State University (Lexington)
January 9  Board of Directors Meeting (Urbana)
February 12  Annual Meeting (Northfield Inn, Suites & Conference Center, Springfield)
February 27  Board of Directors Meeting (Urbana)
March 3-5  Working Group Meetings (TBD)

Please call the C-FAR office or check the calendar on the C-FAR website at www.ilcfar.org for further details.