auri™

AG INNOVATION NEWS

The newspaper of the Agricultural Utilization Research Institute

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The SCIENCE of livestock feed selection

AURI trials take guesswork out of feed options

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PHOTO BY ROLF HAGBERG

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A novel idea for non-nutty snacks

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First crush plant for canola country

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Network shares food safety expertise

nots!™ for the allergic peanut-lover

AURI helps entrepreneur develop a not-peanut snack

BY JONATHAN EISENTHAL

Food allergies continue to create consumer markets, and the potential for nut-free snacks is one of the biggest, but many big ideas start small.

Entrepreneur Rob Fuglie had his "aha" moment when he was standing in his pantry, snacking on sunflower seeds and suddenly he thought, "I love this taste but I miss the feeling of popping a peanut or a cashew into my mouth, the crunch, the feel of it. What if...."

He was missing the taste of nuts because his family discovered his son's peanut allergy when, at 18 months, the boy toddled to the door to kiss his big sister goodbye before she got on the bus. She had just eaten a peanut butter sandwich, and the little boy broke out in a rash.

By the time his son was three, the Fuglie family had completely changed their food buying habits to cut out tree nuts and peanuts.

"About 10 percent of the population has food allergies, but that dictates the food choices for about 25 percent of the population—families shop for the person in the family with the allergy," says Fuglie, who has an MBA from the University of St. Thomas and a communications degree from Saint Cloud State University. "Our son's needs dictate 100 percent of the purchasing decisions for our family, and it goes beyond just us—his grandmother bakes differently, now. And it's the same for every family with someone allergic. There's a large market opportunity out there."

Fuglie went to work in his kitchen with a pile of sunflower seeds, throwing in bits of this and pinches of that, and came up with "Nots!™"

But it's one thing to have a tasty homemade recipe and another thing entirely to have a product for sale in stores. That's where Charan Wadhawan, food scientist at the Agricultural Utilization Research Institute, came in to assist. Now "Nots!™" are available at 24 locations—food co-ops and specialty stores—and the long-term strategy includes major retailers and institutional markets like college bookstores and snack shops.

"If you have a recipe for cookies, and you want to bring it to market because you feel there's nothing like it on the market, AURI can help you take it from concept to commercialization," says Wadhawan, who has been with AURI for 21 years. "Clients often don't know where to start. We work with them on standardizing the recipe, moving from home methods to industrial methods, helping them scale up, performing quality control, and making sure the product comes out the same every time. We do nutritional analysis and make sure that a product meets FDA labeling requirements."

In the case of "Nots!™" keeping a "clean label," which is a label with minimum additives and preservatives, was a top priority; Wadhawan helped Fuglie develop a formula with just three ingredients—sunflower seeds, olive oil and cane sugar syrup—to maximize appeal to people with different food allergies.

Fuglie spent three days at Wadhawan's lab in Crookston, where they together settled on the right formula and device for making the snack. AURI also provided cost-share assistance on a critical development item: getting registered with the international body, GS1, in order to have a UPC label. The registration costs $700, and having a UPC label is essential for developing relationships with distributors.

Now Fuglie works with a commercial kitchen in Fergus Falls, still on a small scale—about 100 cases a month—but the sky's the limit. Eventually he hopes to have full-time workers and a dedicated production space.

Like many agricultural value-added activities in Minnesota, the dollar impact reaches from the farm gate to the retail store. Agricultural and food processing represent a fifth of Minnesota's economy and AURI is at the forefront helping entrepreneurs develop the "next big thing," to help ensure that Minnesota keeps the ag and food economic engine running strong.■

Where to Buy Nots!™

The number of stores selling Nots!™ continues to grow. Check out *www.nots-snacks.com/purchase.html* for an updated list of sites where you can purchase Nots!™ Or buy them online through the same URL.

AURI and Nots!™

Idea to Commercialization:
Create a non-nut snack that would appeal to those with nut allergies.

AURI's role:
AURI scientist Charan Wadhawan helped create a nutritional label with minimum ingredients, and AURI offered cost-share assistance to help procure a UPC label for "Nots!™"

Outcomes:
"Nots!™" owner Ron Fuglie works with a commercial kitchen in Fergus Falls to produce about 100 cases a month. Eventually he hopes to have full-time workers and a dedicated production space.

Nots! provide a crunchy snack for those with nut allergies.

PHOTOS BY ROLF HAGBERG

PHOTO BY ROLF HAGBERG

"About **10** percent of the population has food allergies, but that dictates the food choices for about **25** percent of the population—families shop for the person in the family with the allergy."

Entrepreneur Rob Fuglie

Entrepreneur Ron Fuglie at the Lakewinds Co-op in Minnetonka, Minnesota.

First canola crush plant arrives in Minnesota

AURI helps find ways to make canola more valuable

BY JONATHAN EISENTHAL

Tucked in the far northwest corner of Minnesota, Hallock is home to just under 1,000 residents, and Kittson County has a population of approximately 4,000. While it is a sparsely populated area, it is very near the borders of Canada and North Dakota, both of which are primary producers of canola, known for the health benefits found in its food-grade oil. In addition, Hallock is near important railway and highway routes, making this corner location a perfect fit for the state's first canola processing plant, which celebrated its grand opening in August.

"This plant provides an anchor industry to this corner of the state," explains Michael Sparby, AURI senior project strategist, who helped gather stakeholders interested in bringing agriculture processing to the area in order to boost area farmers and strengthen the rural economy.

Neil Juhnke, president and COO of Northstar Agri Industries, speaks at the canola processing plant's grand opening.

"We've created 47 full-time jobs in Kittson County, and their wage rates range from $15 to $22 dollars an hour, plus benefits. It's a $3.5 million total payroll per year," says Neil Juhnke, president and COO of Northstar Agri Industries, which operates the plant.

In addition to providing jobs, about 100 individual local farmers and business people in the area own a substantial stake in the business. The majority of the company is owned by NASDAQ-traded PICO holdings, a La Jolla, California company.

Northstar Agri Industries, Minnesota's first canola processing plant, held its grand opening celebration on August 8.

The Long Road

Discussions about how to bring agriculture processing to this part of the state began in the early 2000s. Few enterprises can match the level of local recirculation of dollars that businesses like ethanol plants and crushing plants can bring to a region, and the more times a dollar is spent locally, the higher the economic impact. It was with this in mind, leaders initially envisioned a biodiesel plant for the Hallock area; AURI and the Northwest Regional Development Commission teamed up to pull together regional stakeholders as well as the the USDA to examine the feasibility of the concept.

"We're experts on biodiesel and the value-added uses of oil," says Sparby. "Part of the importance of feasibility studies is to save money by determining early on whether a plan is economically viable."

So, as market conditions changed, and a biodiesel plant became less economically viable, the value of food-grade oil, such as canola oil, began to rise, bringing interest from outside capital investors and management. Once plans for the canola crush plant were finalized, the plant was built in about 16 months. The plant includes a grain receiving and storage facility, a crush plant that produces both crude canola oil and high protein canola meal animal feed, and a refinery that produces the food-grade oil.

Production began in May and reached full capacity—crushing a thousand US tons of canola a day—in early June.

Northstar's management praises the role AURI played in helping to initiate the idea of value-added agricultural processing in Northwest Minnesota, and is looking to AURI for support as the business continues to grow and develop.

"AURI has always been supportive of this type of product, and our contact with them during the development was important," says Juhnke.

Adding value to the future

Canola growth in the northwest part of the state has already increased, thanks in part to the plant. In 2011, there were just over 20,000 acres of canola grown in the northwest part of Minnesota. In 2012, there are 60,000 acres of canola being grown.

Approximately 40% of a canola seed is used for the food-grade oil that is praised for being low in saturated fat and containing both omega-6 and omega-3 fatty acids. The other 60% of the seed is used for meal for cattle and pigs.

Part of the vision for the future includes finding ways to add value to the meal coming out of the plant as well as the coproducts, which are the leftovers that occur during the canola processing. What remains after refining the crude oil is soap stock and distillate, which is a source for Vitamin E. Northstar currently sells these materials to a third party for further refining.

"The potential always exists for Northstar to do its own soap stock production or other value-added uses with these coproducts," says Juhnke. "AURI can bring a lot of expertise on alternate product utilization to the table."

With an eye to the future, company officials have already filed for permits needed to expand plant operations. ■

New network helps smaller businesses with food safety

BY LIZ MORRISON

Before Lavonne Kucera joined Caribou Coffee, she was part of a large food safety department at a multi-national company. But at Minneapolis-based Caribou, the entire food safety department is "me and only me!" Working solo, Kucera missed exchanging ideas with other experts in her field.

Jan Lillemo had the same feeling. She, too, worked in large food safety departments at several major food companies before starting her own consulting business, Lillemo & Associates, in Plymouth, Minnesota. If you're the only food safety expert in your organization, she says, "Who do you bounce ideas off?"

Founded in a restroom

To connect with their colleagues, Lillemo and Kucera wanted to start their own "idea exchange." Their concept, now known as the Minnesota Peer-2-Peer Food Safety Network, had humble roots: Lillemo likes to say the network was officially founded in a ladies restroom! At a seminar last year, she and Kucera were talking about how to get a group of peers together. They carried their conversation into the restroom, where they were overheard by an AURI staffer, who said: I didn't mean to eavesdrop, but I think AURI can help.

AURI worked with Lillemo and Kucera to organize the group and now provides administrative support. The network is for food safety professionals working for small- and medium-sized businesses. The group meets monthly to share expertise, best practices and research. The members — who all have 15 to 30 years of experience in the field — are typically the only food safety specialists at their companies.

Members hail from a broad range of food industry sectors: food processing, retail grocery, wholesale distribution, restaurants and food service. And most members have worked in more than one sector. This breadth of experience is a big plus, Kucera says, offering "vast knowledge" and many strategies for ensuring a safe food supply.

"Our mission is to be a resource for each other," Lillemo says. "There are lots of good food safety groups around, but I don't know of any other group like this one, just for people who work in small food safety departments."

Despite their diversity, network members have many food safety issues in common, Lillemo says. At a recent meeting, the group discussed approaches to certifying and auditing suppliers. "This is a huge issue now. We are responsible for assuring that our suppliers are providing safe products."

It was especially helpful to hear about other companies' policies for adding and dropping suppliers, Kucera says. "I took some of those ideas and modified parts of our supplier certification program."

To inquire about joining the Minnesota Peer-2-Peer Food Safety Network, call Carissa Nath at AURI in Marshall, at **507.537.7440.**

At another recent meeting, the group talked about "natural" trends in food marketing. "There's no FDA definition of natural," Kucera says, "so it was helpful to hear how others are defining it."

Getting ready for new food safety rules

Another key issue that all the members have in common is preparing to meet stringent new regulations, Lillemo says.

In 2011, Congress passed sweeping changes in the nation's food safety laws. The Food Safety Modernization Act sets new standards for growing, harvesting, storing and transporting fruits, vegetables and many other foods. All food companies will be required to identify food safety hazards in their operations, and develop controls to prevent contamination.

Specific rules are still being written, says AURI meat scientist Carissa Nath, but the new requirements will be similar to the Hazard Analysis and Critical Control Point (HACCP) plans now required in the meat, seafood, juice and egg industries.

"At AURI, we work with a lot of food-related projects," says AURI project director Bruce Stockman, who assists with network meetings. "Many, if not all, will be affected by these new food safety rules." One of AURI's priorities is to help these smaller food companies and start-ups comply, by connecting them to training and other resources, Stockman says.

It's important for the food industry to work together to ensure a safe food supply, Lillemo and Kucera say. "We believe that food safety is not a competitive advantage," Lillemo adds. "The food industry rises and falls together. If one company has a food safety problem, we all have a problem." ■

Why do feed trials?

New AURI trials focus on turkey, pigs and cattle

BY LIZ MORRISON

Improving livestock feed with the coproducts left over during agricultural processing is a win-win for Minnesota's agricultural industry. Livestock farmers find new nutritional, lower cost feed options. The agricultural processing industry finds ways to add value to the products left over during processing.

AURI does many feed trials, which examine the nutritional impact of various feed options. These help Minnesota livestock producers evaluate if and when to take advantage of the state's abundant supplies of alternative feeds: nutritious, low-cost ingredients like distillers grains, glycerin and other agricultural processing. AURI trials "validate opportunities to use undervalued coproducts" in animal diets, says Al Doering, AURI coproducts scientist.

Dried distillers grains with solubles (DDGS), for example, are a coproduct of ethanol production, and also serve to lower the cost of feeding cattle, swine and poultry, says Jen Wagner-Lahr, AURI senior director of innovation. "This is especially important when you see where corn and soybean prices are going." Rising grain prices "make it more difficult for livestock producers to maintain healthy profit margins." The profit squeeze has intensified with the 2012 drought, which has devastated the U.S. corn crop and pushed grain prices to historic highs, she adds.

AURI-sponsored research often results in new uses or markets for Minnesota feedstuffs, too, Doering says. Take AURI studies on ensiling sugar beet tailings, which identified a higher-value use for the sugar industry coproduct. Likewise, recent trials of low oligosaccharide soybean meal showed the value of using the specially-processed feed in baby pig diets. The research is expected to open up new markets in Asia.

The feed trials also help Minnesota's renewable fuel manufacturers "strengthen their coproduct sales," Wagner-Lahr says. In the ethanol industry, for example, sales of wet and dried distillers grains can account for up to one-third of plant revenues. Making use of these coproducts is essential to the profitability of the business. The trials also help ethanol producers understand livestock growers' need for consistent, high-quality feed ingredients, adds Sally Noll, a University of Minnesota livestock scientist, who has worked with AURI on many feed trials.

AURI often partners with the University of Minnesota and state grower groups to carry out feed studies. "AURI is a source of unbiased information," says AURI's Doering, who is also a sheep producer and former livestock production specialist. "People very much respect the results coming out of these trials."

Here's a brief look at some recent feed studies that will benefit Minnesota's three largest livestock sectors, as well as renewable fuel makers.

The University of Minnesota's Sam Baidoo (center) and Dillon Hansen (right) demonstrate to AURI's Al Doering (left) how a mixer is utilized to distribute the wet distillers grains in the swine feed.

PHOTO BY ROLF HAGBERG

Talkin' turkey

Feed trials will help growers include more DDGS in turkey diets without affecting litter quality.

Livestock sector: Turkeys.

Coproduct: Dried corn distillers grains with solubles (DDGS), an ethanol coproduct.

Background: Poultry producers often include 5% to 10% DDGS in livestock rations. But concerns about the effects of higher levels of DDGS on meat birds' health and growth has limited usage, says Sally Noll, Ph.D., a University of Minnesota animal scientist, who led the research.

The problem: Higher levels of DDGS in turkey diets may cause an electrolyte imbalance in the birds, which results in loose droppings and wet bedding, or litter. Wet litter, in turn, can lead to footpad sores, leg ailments and higher mortality rates.

Study goal: To test how feeding turkeys more DDGS affected electrolyte balances, litter moisture, foot health, and weight gain. In two experiments at the University of Minnesota in St. Paul, turkeys were fed diets containing 20% DDGS or 20% DDGS plus 10% canola meal, another common alternative feed ingredient.

Partners: The studies were sponsored by AURI and the Minnesota Corn Research & Promotion Council.

Results: The first study compared the effects of three diet formulations on litter moisture and growth:

- a traditional corn-soybean meal diet;
- a corn-soybean meal diet plus 20% DDGS;
- and a corn-soybean meal diet plus 20% DDGS and 10% canola meal.

Three different amounts of chloride, an electrolyte mineral, were also added to the diets in order to evaluate the effects of higher electrolyte content on turkey growth.

The study found that adding DDGS or DDGS-plus-canola-meal to turkey diets increased litter moisture. Litter moisture also increased as chloride levels rose in all three diets.

In addition, the trials found that higher chloride levels increased feed conversion in one of the diets, the DDGS-plus-canola-meal ration. So turkeys had to eat more food to gain a pound of weight, compared to turkeys fed a diet lower in electrolytes. That's a production disadvantage.

The second study looked in more detail at the effects of different chloride levels in the DDGS-canola meal diet. In this study, turkeys ate less feed when dietary chloride levels exceeded 0.22%, causing them to grow more slowly. Litter moisture increased with higher chloride level results in poorer footpad condition.

Conclusions: Growers can feed up to 20% DDGS in turkey diets and wet litter can be minimized by limiting chloride level. Alternatively, growers who are concerned about increased litter moisture can lower DDGS levels to 10% or 15% of the diet. Turkey growers feeding diets that include 20% DDGS and 10% canola meal should limit chloride levels in order to maintain feed intake and growth, and minimize wet litter.

Outcome: Revised guidelines for including DDGS in turkey diets.

PHOTO BY ROLF HAGBERG

Better wetter?

Feed trials could help Minnesota's swine industry use liquid ethanol coproducts, lowering production costs for both industries.

Livestock sector: Swine.

Coproducts: Wet corn distillers grains and liquid corn distillers solubles, ethanol coproducts.

Background: Distillers grains and distillers solubles must be dried for use in swine feed today, because most U.S. hog producers can't handle wet or liquid feedstuffs. However, liquid swine feed handling systems are becoming popular in Canada and Europe, and interest is growing in this country, too, says Al Doering, AURI coproducts scientist.

The problem: Both ethanol manufacturers and hog producers are coping with prolonged periods of tight profit margins due to high corn prices. Drying distillers grains and solubles takes a lot of energy, raising the cost of these feed ingredients. If pork producers could instead use wet distillers grains and liquid distillers solubles, both industries would save money and cut production costs.

Study goal: To test the value of wet distillers grains and corn solubles in the feed of grow-finish hogs. In trials at the University of Minnesota Southern Research and Outreach Center at Waseca, five groups of pigs will be fed diets containing different combinations of wet or dried distillers grains and solubles.

Partners: The study, led by University of Minnesota livestock scientist Sam Baidoo, Ph.D., is sponsored by AURI, the Minnesota Corn Research & Promotion Council, and the Minnesota Pork Board.

Outcome: Results will be available later this year.

Continued on page 8

PHOTO BY ROLF HAGBERG

Before fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system.

Continued from page 7

PHOTO BY ROLF HAGBERG

PHOTO BY ROLF HAGBERG

If livestock producers are able to use wet distillers grains (above) without having to dry them, it improves efficiency and adds benefit to ethanol production, explains AURI Senior Project Development Director Denny Timmerman, who is the team leader on several AURI feed trials.

Safe and nutritious

Feed trials showed that renewable fuel coproducts did not promote E. coli in cattle.

Livestock sector: Beef cattle.

Coproducts: Dried distillers grains with solubles (DDGS), an ethanol coproduct; and glycerin, a biodiesel coproduct.

Background: Feeding distillers grains lowers production costs for cattle producers. Beef and dairy cows are the primary market for both wet and dried distillers grains, consuming about 80% of U.S. output.

The problem: Earlier research from Kansas State University suggested that adding DDGS to cattle feed increased the prevalence of E. coli O157:H7, a pathogen that can cause serious illness in humans. Previous research also suggested that soy glycerin or less-processed grain could reduce the prevalence of E. coli in calves fed DDGS.

Study goal: To evaluate the effects of distillers grains, grain processing, and glycerin on the prevalence of E. coli O157:H7 in cattle. Two trials were carried out at the University of Minnesota and three trials were done at the University of Kansas.

Partners: The trials were led by livestock scientists Alfredo DiCostanzo, Ph.D., of the University of Minnesota and Jim Drouillard, Ph.D., of the University of Kansas. The research was sponsored by AURI and the Minnesota Corn Research & Promotion Council.

Results: Feed trials were performed on calves that were artificially inoculated with E. coli O157:H7, and calves that were naturally infected with the pathogen. Both groups were fed distillers grains. The artificially infected calves were also fed a combination of other dietary ingredients, including steam flaked corn, dry rolled corn, and soy glycerin.

Conclusions: The research showed no link between dietary ingredients and the incidence or prevalence of E. coli O157:H7, DiCostanzo says. In addition, the Minnesota research found that adding 10% soy glycerin to the diet boosted cattle growth rates by about 15% and improved feed handling.

Outcomes: Minnesota cattle producers can continue to feed distillers grains with confidence. In addition, cattle feeders can improve performance by adding 10% soy glycerin to cattle diets. ■

The future of soybean meal

Leaders from across the soybean meal industry gathered at the Minnesota Soybean Growers Association recently to discuss how to enhance soybean protein production and utilization in Minnesota. Ag scientists, soybean processors and others in attendance discussed potential uses and nutritional benefits found in enhanced soybean meal products and defined potential areas of opportunity for this value-added product. ■

AURI STAFF COLUMN: SEEING AROUND CORNERS

PHOTO BY ROLF HAGBERG

What's new in transportation fuels

BY DOUG ROOT, PH.D.

AURI SENIOR SCIENTIST OF BIOMASS & RENEWABLE PRODUCTS TECHNOLOGIES

While ground-breaking scientific technology is rarely predictable, we do know that there will always be change and innovation. In the area of transportation fuels, there are many developments that will likely have an impact on Minnesota's agriculture economy. This column gives an overview of the factors that might impact renewable fuels, but the only certainty about future developments is that "the future ain't what it used to be," as Yogi Berra noted many years ago.

In the biofuels world, unpredictable developments in weather, commodity markets, and technology will maintain a certain level of turmoil for those in the ethanol and biodiesel industries. The technology for use of E15 (15% ethanol in blended gasoline) for late-model vehicles appears to be acceptable to the EPA, and this opens the way for states to require E15 at the pump. However, opposition from petroleum companies and others continues to be a challenge to greater utilization of ethanol. This summer's droughts are also impacting the price of corn, raising the production costs of ethanol. In addition, the energy balance of biofuels, land use changes, and greenhouse gas impacts are being widely debated and may influence decisions regarding ethanol production in Minnesota.

New technologies for biodiesel production are under development in Minnesota, which could expand the production capacity within the state. There is also much discussion around the Renewable Fuel Standards, which mandate the use of defined amounts of renewable fuels. Increases in utilization of biodiesel in Minnesota are mandated at a 5% biodiesel blend (B5) now, B10 in 2013, and B20 in 2015. However, outside factors could cause delays in the schedule.

One of the biggest changes in recent years is the technology for production of biobutanol as a potential transportation fuel. Biobutanol is an alcohol similar to ethanol, but with four carbon atoms instead of the two carbons in ethanol. It is produced from corn starch by microorganisms in a process similar to fermentation, but yeast is not involved in the process. Two biobutanol plants in Minnesota, Gevo in Luverne and Butamax in Lamberton, appear to be blazing the path toward a sustained biobutanol industry. Also, Butrolix in Duluth has technology that may increase the efficiency and yield of butanol from fermentable sugars. It is not clear yet whether butanol can be cost competitive with ethanol for transportation fuel, but the availability of markets for butanol as an industrial chemical allows decoupling of butanol production from transportation fuel markets.

It is difficult to know which innovations and changes will succeed, but it seems clear that biofuels will continue to have a great impact on the agriculture economy in Minnesota for years to come. The potential for innovation every day is a good reason to be optimistic about the future of value-added agriculture in greater Minnesota.■

PHOTO BY ROLF HAGBERG

New staff bring variety of experience and expertise

Over the last few months, AURI has welcomed several new staff. "We're really excited about the skills and expertise these new staff members bring," says AURI Executive Director Teresa Spaeth. "They are each experts in their fields, and add a lot of value for our clients."

Travis Sisco

Project Accountant

Sisco is a recent graduate of the University of North Dakota where he received his B.A. in accounting. Sisco has interned with Good Insurance in Grand Forks, N.D., and worked in several other positions while a student.

Nan Larson

Rural Innovation Network Director

Larson has a 20-year working history in the economic development field, with an emphasis on strategic partnering, facilitation, planning, and management. She has a wide network of contact resources for project management, implementation, and support; has experience in writing and administering grants; and has served on the Southwest Minnesota Workforce Council board for the past four years. Larson is a Certified Economic Development Finance Professional by the National Development Council.

A.J. Duerr

Planning and Government Relations Director

Prior to his time at AURI, Duerr was the director of member services at Cooperative Network, a two-state association of cooperative businesses. He also spent six years as a legislative staffer in the Minnesota House of Representatives, including two years as committee administrator of the House Agriculture Committees.

Rod Larkins

Senior Director of Science and Technology

Larkins previously served as the special projects director for the Initiative for Renewable Energy and the Environment at the University of Minnesota. Prior to that position Larkins had a long and successful career with 3M, where he held positions of increasing responsibility in research management—with a focus on establishing new businesses. During his career at 3M, Larkins was awarded two U.S. patents and earned numerous individual and team recognition awards.

AURI EXECUTIVE DIRECTOR'S COLUMN

Building ag organizations' capacities essential to industry's future

BY TERESA SPAETH
AURI EXECUTIVE DIRECTOR

One doesn't have to spend long at Farmfest or the Big Iron Farm Show to quickly realize how many organizations there are in the world of agriculture. From policy to research to marketing, each group has their niche and an important role in agriculture. It is essential to the future of Minnesota's agriculture industry that we build the capacities of these organizations so that each of us can do more and better work in our areas of expertise.

For example, in the research realm, you can find the University of Minnesota conducting basic research that is critical to create new ideas for the future of the industry; there are large businesses like General Mills and Cargill that have their own research capabilities to grow their corners of the market; AURI specializes in applied research and development for small- and medium-sized businesses; and there are many other organizations with varied roles in research. In the policy realm, you'll find commodity groups, Farm Bureau, Farmers Union, and many, many others. There are organizations with focuses on rural development, clean energy, food safety, and much more. And we're all part of Minnesota's agriculture industry—together we're the second largest employer in the state of Minnesota.

Today, agriculture is facing unprecedented opportunities and threats. New technologies and advancements, as well as a growing population, allow for vast opportunities for growth. We are also facing increased scrutiny from a public that is more discerning than ever about the products they eat and buy, and from other industries that can unfortunately find threat and problems in every advancement we try to make. To strengthen the industry as a whole, we must build the capacities of each of its parts.

Nearly a decade ago, the Gallup organization unveiled the results of a 30-year research project that studied the topic of strengths, and how individuals can know and work toward their own strengths. I believe this concept is important not only for individuals but for organizations. We each have our areas of expertise, and when we're working to build further on these strengths, we are building the foundation for a solid industry as a whole.

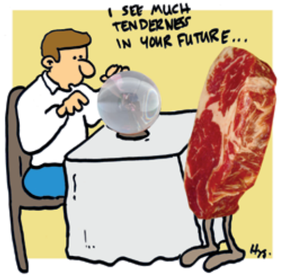
There are important ways we can look to build capacity in agricultural organizations in the future:

- investing in our employees—from having the right higher education training programs in place to furthering professional development;
- advocating together for the agriculture industry—from marketing to funding to public policy, we need to speak as one voice whenever possible; and
- finding ways to coordinate and partner with each other to maximize the strengths found in each individual agriculture organization.

It may be cliché, but true, that alone it could be a tough road ahead; working together makes for a much brighter future. ■

ELSEWHERE IN AG INNOVATIONS

Editor's note: As a service to our readers, we provide news about the work of others in ag utilization. Often, research done elsewhere complements AURI's work.



Predicting lasting tenderness in beef

Scientists at the U.S. Meat Animal Research Center in Nebraska have developed a noninvasive way to predict tenderness in the ribeye/strip loin muscle. This process is based on visible and near-infrared reflectance (Vis/NIR) and doesn't require cooking or tasting. This process works on beef and pork. Over the past few years, more than 4,000 beef carcasses and more than 1,800 pork loins were evaluated with Vis/NIR technology. By predicting meat tenderness the industry could better channel beef product to their best use and deliver more consistent products to the supply chain. This Vis/NIR technology can also help predict how long meat will stay brightly-colored. Bright red or pink meat is considered fresher and higher quality.

August 2012
USDA-ARS

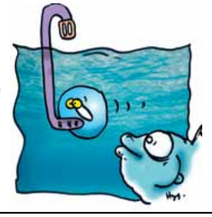
Using egg yolks to fight disease

Scientists at the USDA Agricultural Research Service are working to fight coccidiosis, a costly disease in chickens. Currently, antibiotics and good management practices are used to control the disease, but more options are need to help with drug-resistant strains. Their answer? Using egg yolks to help prevent this disease. Chicks should be immune to the disease if they consume hyperimmune egg yolk antibodies from immune chickens. Egg yolks are spray dried and mixed with feed that is given to chicks right after hatching.

July 2012
USDA-ARS

Underwater seeds

Although rice is known for growing well in wet conditions, it cannot survive being covered completely with water. The International Rice Research Institute has bred a new kind of rice that can survive floods for up to 14 days. This rice variety, Submarino, is currently grown in the Philippines.



August 13, 2012
ScienceDaily

No more brown apples

A small fruit grower, Okanagan Specialty Fruits, from British Columbia has created an apple that won't turn brown when it is bruised or cut. The company is working on several different varieties of this type of apple. The way these apples are genetically modified is based on a technique used on potatoes from Australian researchers. By "turning off" the enzyme that makes the apples turn brown, actually helps improve the taste and smell of apples.

Although the apples won't turn brown they will still naturally decay. The fact that these apples won't turn brown will help growers and packers waste less fruit. The apple is still in the testing phase.

July 15, 2012
Digital Journal

Squeezing out more value

Leftover food wastes, such as citrus peels, pea pods and shells from nuts could be converted into high-value chemicals. The University of York is using green chemical technologies to extract chemicals such as pectin, limonene and fatty acids from these items. Uses for these chemicals could range from solvents, flavors, fragrances, food additives, cosmetic ingredients and more.

July 26, 2012
Food Production Daily

Banana coating increases shelf life

Research from the Tianjin University of Science and Technology in China shows that a spray-on solution may be able to extend the shelf life of bananas for up to two weeks. The hydrogel coating is a superabsorbent material made from chitosan, a substance derived from shrimp and crab shells. Chitosan kills bacteria that causes fruits and vegetables to rot. A coating like this could be used at home by consumers, in supermarkets, or during transportation of bananas.

August 24, 2012
IFT

AURI'S CORE FOUR QUIZ

How much do you know about AURI's core four areas: food, renewable energy, coproducts, and biobased products? Take the below quiz.

Food Products

What are the four main quality grades that can be applied to beef?

A. A, B, C, D
B. Prime, Choice, Select, Standard
C. Excellent, Best, Better, Good

Answer: B

Renewable Energy

What is Minnesota's approximate annual ethanol production?

A. 5 million gallons per year
B. 125 million gallons per year
C. 1.1 billion gallons per year

Answer: C

Coproducts

What is the primary coproduct (leftover) from biodiesel production?

A. Dried Distillers Grains
B. Glycerin
C. Vegetable Oil

Answer: B

Biobased Products

What is the definition of a biobased product?

A. A commercial or industrial product composed in whole or in significant part of biological products
B. A coproduct of biolysis
C. A product that contains the biography of the inventor

Answer: A

ABOUT AURI

The Agricultural Utilization Research Institute (AURI) helps develop new uses for agricultural products through science and technology, partnering with businesses and entrepreneurs to bring ideas to reality. AURI staff are skilled to walk clients through the entire development journey of bringing a new product or process from idea to reality.

Service Areas: What We Provide

Applied Research and Development

Through practical, applied research we identify emerging opportunities to add value to agriculture products. This information is publicly available in order to help entrepreneurs and businesses generate ideas for new products and processes.

Innovation Networks

When deciding the feasibility of a new product or process, it is critical to have access to industry experts and a science-based network of people. With a broad range of networks, AURI can help bring together the right people at the right time.

Hands-on Scientific Assistance

Scientists are available to provide consulting and technical services in the areas of:

- Product and process development
- Product evaluation and testing
- Sourcing materials, equipment and services

Labs are available to clients for hands-on testing and development.

Learn More

- Contact one of the AURI Offices to speak with a project development director about your business.
- Visit www.auri.org to see the latest research and learn about upcoming events.
- Sign up to receive the Ag Innovations newspaper or the AURI electronic newsletter to stay informed about AURI projects and clients.
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RENEWABLE Energy Innovators

BY LIZ MORRISON

LeAnn Oliver, senior advisor for clean energy and rural development for the U.S. Department of Energy, spoke at the July Minnesota Renewable Energy Roundtable. While in Minnesota, Oliver met with leaders from across agriculture, higher education, public policy and the renewable energy industry.

Since its inception in 2006, the Minnesota Renewable Energy Roundtable has been a unique partnership, bringing together people from across the renewable energy industry to spur innovation to make Minnesota a national and global renewable energy leader. Partnerships are essential to the roundtable, which is led by a planning team of representatives from the Minnesota Department of Agriculture, Minnesota Department of Commerce, University of Minnesota, the Minnesota State Colleges and Universities System, and AURI.

Recently, leaders looked back at a list of action items from the initial planning days to see what goals and projects had been accomplished. From education to economic development, the following are just a few of the impacts generated in part due to roundtable participation.

Biofuels in gas turbines

The Center for Diesel Research at the University of Minnesota, the Soybean Research & Promotion Council, Xcel Energy and others have worked together to examine the feasibility of using bio-oils as a replacement for petroleum fuels in gas turbines for electrical generation. As a result of this work, Xcel Energy is in the process of implementing these technologies in their operations.

Gasification energy production

Participants in the roundtable expressed a desire early on to see gasification energy production on a small and large scale. Today, there are two large-scale production gasification facilities utilizing biomass as a feedstock. The first one is at the Chippewa Valley Ethanol Company and the second one is located at the University of Minnesota – Morris. AURI is working with 10 different partners to bring forward gasification to liquid fuel on a small scale in Roseau, Minnesota. There are currently four additional gasification projects ongoing in various states of development.

Identifying renewable energy workforce needs

With input from a variety of roundtable members, the Minnesota State Colleges and Universities system developed new courses that provide the knowledge-base required by the renewable energy industry. In addition, AURI, the Minnesota Soybean Research & Promotion Council and the Minnesota Corn Research & Promotion Council conducted a workforce gap analysis and asset inventory that was shared and implemented by the renewable liquid fuels industry in Minnesota.

Increased biodiesel use

Many roundtable participants had a hand in getting Minnesota's biodiesel mandate into place.

This is just one way members of Minnesota's renewable energy industry are working together to get biodiesel into the transportation infrastructure and supply chain. Minnesota Soybean Growers and the National Biodiesel Association have implemented training to bring the value of Renewable Identification Numbers to Minnesota's biodiesel industry, thereby increasing the value of biodiesel to Minnesota producers by an additional $1 per gallon.■