AG INNOVATION NEWS
The newspaper of the Agricultural Utilization Research Institute

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FOLLOW US ON: "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 Ron Fuglie

"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. "We have some very talented students in our college and graduate school programs that can help commercialize ideas and work with them on standardizing the recipes, 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 labeled with minimum additives and preservatives, was a top priority. Wadhawan helped Fuglie develop a formula with just three ingredients—sunflower seeds, olive oil and sea salt—that would appeal to people with different food allergies.

Fuglie spent three days at Wadhawan’s lab in Crookston, where they together settled on a formula with a peanut or a cashew into my mouth, the crunch, the feel of it. I miss the feeling of popping a peanut or a cashew into my mouth, the crunch, the feel of it. I miss the feeling of popping a peanut or a cashew into my mouth, the crunch, the feel of it. I miss the feeling of popping a peanut or a cashew into my mouth, the crunch, the feel of it. I miss the feeling of popping a peanut or a cashew into my mouth, the crunch, the feel of it. I miss the feeling of popping a peanut or a cashew into my mouth, the crunch, the feel of it.

Eventually he hopes to have full-time workers and a dedicated production space. That’s where the “next big thing,” to help ensure that Minnesota keeps the ag and food economic engine running strong.

Agricultural and food processing represent a fifth of Minnesota’s economy and AURI is at the forefront helping entrepreneurs develop new products and new value-added activities from the farm gate to the retail store. Like many agricultural value-added activities in Minnesota, the dollar impact ranges from the farm gate to the retail store.

AURI officials said food processing is one of the growth industries in the state, with the food processing industry’s market predicted to grow six percent per year, to $314 billion by 2015. The number of small, medium and large food companies in Minnesota continues to grow.

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 AURI’s expertise comes in to assist. Now “Nots!” are available at 25 locations—food co-ops and specialty stores—and the long-term strategy includes major retailers and institutional markets like college bookstores and snack shops.

Nots!™ are available online through the same URL. 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.

“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 Ron Fuglie

By Jonathan Essencial

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 sets standing in his pantry, smacking on sunflower seeds and suddenly he thought, “I like this 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 raising the same sorts of nuts his family discovered his son’s peanut allergy when, at 10 months, the boy toddled to the door to kiss his big sister goodbye before she goes on the bus. He had just eaten a peanut butter sandwich, and the little boy broke out in a rash.

His grandmother bakes cookies, and in a communications degree from Saint Cloud State University, “Our son’s needs dictate the food choices for our family, and it goes beyond just us—his grandmother bakes differently, now. And in the same way every family with someone allergic.

There’s a large market opportunity.

Fuglie went to work in his kitchen with a pile of sunflower seeds, throwing in bits of this and that and pinches of that, and came up with “Nots!”™ A product for sale in stores. That’s where AURI’s role.

AURI helped entrepreneur Rob Fuglie develop a formula with just three ingredients—sunflower seeds, olive oil and sea salt—that would appeal to people with different food allergies.

Outcomes:

AURI helped entrepreneur Rob Fuglie work 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.

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AURI and Nots!™

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

AURI’s role: Through an Innovation Partnership, AURI provided cost-share assistance to help pursue a GMP label for “Nots!”™

Outcomes: AURI helped Rob Fuglie work 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.

AURI helps entrepreneur develop a not-peanut snack

What if...“ I love this taste but...”

“Nots!”™ owner Ron Fuglie works at the lakewinds Co-op in Minnetonka, Minnesota. (PHOTO BY ROLF HAGBERG)
First canola crush plant arrives in Minnesota
AURI helps find ways to make canola more valuable

BY JONATHAN ESCHENFELTER
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 tied to its food-grade oil. In addition, Hallock is one of the closest communities to the state’s only current canola processing plant, which celebrated its grand-opening in August.

"This plant provides an onshore industry in this corner of the state," explains Michael Sparby, AURI senior project specialist, who helped gather information and support for bringing agriculture processing to the area in order to boost area farmers and strengthen the rural economy.

Juhnke, president and COO of Northstar Agri Industries, which operates the plant.

"We've created 47 full-time jobs in Kittson County, and another 100 individual local farmers and business people in the area own a substantial stake in the plant," says Neil Juhnke, president and COO of Northstar Agri Industries, who speaks at the canola processing plant's grand opening. "In addition to providing jobs, about $3.5 million total payroll per year," says Neil Juhnke, president and COO of Northstar Agri Industries, who speaks at the canola processing plant's grand opening.

So, as market conditions changed, and a biodiesel plant was important," says Juhnke. "AURI has always been supportive of regional stakeholders as well as the USDA to examine the feasibility of the concept. We're experts on biodiesel and the value-added uses of coproducts," says Juhnke. "AURI can bring a lot of expertise on alternate product ramifications to the table."

The Long Road
Discussions about how to bring agriculture processing to the area began in the early 2000s. The enterprises can match the level of local localization of did not businesses like ethanol plants and refining plants bring to a region, and the more time 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 in the USDA to examine the economics of the biodiesel concept.

"We've explored biodiesel and the value-added uses of coproducts," says Neil Juhnke, president and COO of Northstar Agri Industries, who speaks at the canola processing plant's grand opening. "In addition, Hallock is near important railway and infrastructure, the Grade oil that is praised for being low in saturated fat and rich in omega-3 fatty acids. This plant provides an onshore industry in this corner of the state." The project has been in the works for about 16 months. The plant includes a grain receiving and storage facility, a crude oil refining section, a vegetable oil extraction area, a seed cleaning and storage area, a distillation area, and a soap making area.

Adding value to the future
Canola growth in the northwest part of the state has already increased, thanks to support from the state. In 2011, there were 40,000 acres of canola grown. In 2012, there are 46,000 acres of canola being grown.

Approximately 40% of a canola seed is used for the food-grade oil that is produced being low in saturated fat and rich in omega-3 fatty acids. This plant provides an onshore industry in this corner of the state. For more than 20 years, AURI scientists have worked to develop a canola variety that can be grown in the northwest part of the state, and now it is ready for commercial production.

Meanwhile, canola meal has been used for feed-grade oil, such as canola oil, begins to rise, bringing interest from canola growers and area farmers. In fact, one of the seed oils for the canola crush plant was finalized, the plant was built in about 10 months. The plant includes a grain receiving and storage facility, a crude oil plant that produces both crude canola oil and high protein canola meal animal feed and a refinery that produce the food-grade oil.

Production began in May and reached full capacity—crushing a thousand tons of canola a day—in July. Northstar’s management praises the city’s ability to help in the effort, "This project was a great opportunity to not only increase the bioeconomy in the area but also to bring in new business and new opportunities," says Neil Juhnke, president and COO of Northstar Agri Industries, who speaks at the canola processing plant's grand opening.

Despite its small size, the area is home to large processing facilities, such as the nearby meat processing plant. The area is home to several beef processors and is a major beef processing area. The area is home to several beef processors and is a major beef processing area.

In 2011, Congress passed sweeping changes in the nation’s food safety laws. The Food Safety Modernization Act now requires in the meat, seafood, juice and egg industries. Hazard Analysis and Critical Control Point (HACCP) plans now required in the meat, seafood, juice and egg industries. The new rules are expected to increase the cost of doing business in the area, but they are also expected to improve food safety.

Likewise, a new federal law requires food companies to develop plans for ensuring a safe food supply. The law is expected to increase the cost of doing business in the area, but the benefits are expected to improve food safety and consumer protection.

"The law is expected to increase the cost of doing business in the area, but the benefits are expected to improve food safety and consumer protection," says Carissa Nath, who is responsible for ensuring that our suppliers are providing safe products. "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’ strategies for auditing and monitoring suppliers. "We are responsible for assuring that our suppliers are providing safe products."

Another key issue that all the members have in common is connecting them to training and other resources, Stockman says. "At AURI, we work with a lot of food-related projects," 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."

Despite the diversity, network members have many food safety issues in common. Lillemo says. It was a huge issue here We are responsible for assuring that our suppliers are providing safe products. "It was especially helpful to hear about other companies’ strategies for auditing and monitoring suppliers. "We are responsible for assuring that our suppliers are providing safe products." It was especially helpful to hear about other companies’ strategies for auditing and monitoring suppliers. "We are responsible for assuring that our suppliers are providing safe products."

"Our mission is to be a resource for each other," Lillemo says. "We meet monthly to bounce ideas off each other." Getting ready for new food safety rules
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"It’s important for the food industry to work together to come up with comprehensive and effective solutions," Lillemo says. "It’s important for the food industry to work together to come up with comprehensive and effective solutions," Lillemo says. "It’s important for the food industry to work together to come up with comprehensive and effective solutions," Lillemo says.
New AURI trials focus on turkey, pigs and cattle

BY LIZ MORRISON

Improving livestock feed with the co-products left over during agricultural processing is a win-win for Minnesota’s agricultural industry. Livestock farmers face a nutritional, lower-cost feed option. The agricultural processing industry finds new sales to add value to the products left over during processing. AURI does many feed trials, which help the industry find ways to add value to the products left over during processing. AURI-sponsored research often results in historic highs, she adds.

The problem:

Livestock sector: Pigs

Background: Pork producers often include 35% to 50% DGS in their swine feed rations to cut production costs. However, feeding liquid distillers grains and solubles (DDGS) to swine is a significant challenge for the pork industry, as these feedstuffs contain a lot of energy, raising the cost of these feed ingredients. If pork producers could instead use DDGS instead of liquid distillers grains and solubles, both industries would realize labor and cut production costs.

Study goal: To test the value of DDGS and corn solubles in the feed of growing pigs.

Partners: The study, led by University of Minnesota researchers Susan L. Slettedahl, Ph.D., is sponsored by AURI, the Minnesota Corn Research & Promotion Council, and the Minnesota Pork Board.

Outcome: Revised guidelines for including DDGS in turkey diets.

Before fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. All ethanol coproducts are dried for swine feeding. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. All ethanol coproducts are dried for swine feeding. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. All ethanol coproducts are dried for swine feeding. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. After fed to swine, ethanol coproducts are mixed in a vat as part of the wet feeding system. All ethanol coproducts are dried for swine feeding.
Livestock sector: Feed costs

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

Background: Feeding distillers grains may produce costs for corn producers. Feed and dairy crops are the primary market for beef and dairy distills grains consuming about 40% of U.S. output.

The problem: Results from research at Kansas State University suggested that adding DDGS to cattle feed to reduce the prevalence of E. coli O157:H7 in cattle feed increased the prevalence of E. coli O157:H7, a pathogen that can cause disease in calves fed DDGS. The artificially infected group also showed similar results. Both groups were resampled at 35, 40, 45, 50, and 55 days post infection. The trial showed that cattle feeders can continue to feed distillers grains for calves, but it may influence decisions regarding ethanol primarily because of the prevalence of E. coli in calves fed DDGS.

Conclusions: The results of this study suggest that the prevalence of E. coli O157:H7 in cattle fed DDGS may be reduced by reducing the amount of DDGS in the diet. In addition, the use of DDGS in cattle feed may reduce the prevalence of E. coli O157:H7 in calves fed DDGS. The results of this study suggest that the prevalence of E. coli O157:H7 in cattle fed DDGS may be reduced by reducing the amount of DDGS in the diet.

What’s new in transportation fuels

Butanol: Fastest growing of the biofuels

Butanol is a liquid fuel that is derived from renewable feedstocks. It is a more versatile fuel than ethanol because it can be used in existing fuel systems without modifications. Butanol can be used in either a 1:1 blend with gasoline or as a 100% butanol fuel. It is also a more efficient fuel than ethanol because it has a higher energy density and a lower emissions profile. Butanol is also more cost competitive with ethanol because it can be produced from a wider range of feedstocks.

In the future of soybean meal

Innovations in soybean meal production and utilization

New staff bring variety of experience and expertise

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 the soybean industry discussed how soybean meal can be used in a variety of applications to improve performance, reduce production costs and add value to soy protein products.

The use of defined amounts of renewable fuels, increases in utilization of biodiesel in Minnesota are mandated at a 5% biodiesel blend (B5) now, B18 in 2013, and B20 in 2015. However, local ethanol facilities could delay the implementation of B20.

Over the last few months, AURI has welcomed several new staff. “We’re really excited about the skills and experience these new staff members bring,” says AURI Executive Director Teresa Larson. “They enjoy the expertise in their fields, and add a lot of value to 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 interned with Good Insurance in Grand Forks, ND, and worked in several other positions while at university.

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. She has experience in working with agricultural issues, and has served on the Northwest Minnesota Workforce Investment Board, Minnesota’s Strategic Economic Development Economic 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 the head of the House Agriculture Committees.
Building ag operations’ capacities essential to industry’s future

For example, in the research you can find, the University of Minnesota is co-developing basic research that can impact future ideas for the future of the industry. There are large businesses like General Mills and Cargill that have their own research capabilities to drive some of their research. Currently, antibiotics and good management practices are going to be created to the diseases, but these options could be needed with drug-resistant strains. The others are needed in a nation to control the bacteria. The University of Minnesota is supplying general research to control strains such as inoculum, proteins, and antibodies from feed. This means that for three of these conditions, we cannot be immune to the disease if they consume that organism and this will cause from the same level. Chickens are sprayed with this drug in cages to pick disease right after hatching.

Fruits, from British Columbia has created a coating made from birch fruit that increases shelf life on the coating.

No more brown apples

While the apples won’t turn brown they will still naturally decay. The fact that these apples won’t turn brown will help preserve and packers won’t lose fruit. The apple is still not shelf-stable but a coating.

Banana coating increases shelf life

Researchers from the University of Science and Technology in Dubai say a spray-on solution may be able to extend the shelf life of bananas. The solution is made from material made from chitosan, a substance derived from shrimp and crab shells. Chitosan kills bacteria that cause fruits and vegetables to rot. A coating like this will help keep bananas fresh for longer, reducing food waste and improving the taste and smell of apples. A coating like this will help keep bananas fresh for longer, reducing food waste and improving the taste and smell of apples.

Squeezing out more value

Lettuce food items, such as celery poles, pea pods and shells from nuts could be converted into high value chemicals. The University of Minnesota is using green chemical technologies to extract chemicals such as pecans, tannins and ferulic acid from these nuts. Some of these chemicals are used in the food industry as food additives, cosmetic ingredients and more.

Using egg yolks to fight disease

Scientists at the U.S. Meat Animal Research Center (USMARC) in Clay Center, Nebraska, are investigating the possibility of using egg yolk as a source of nutrition to promote the growth of cattle. The USMARC activity is based on the idea that egg yolks contain beneficial nutrients. In previous studies, egg yolks were found to provide better growth performance and lower feed costs compared to other feed sources. The researchers are investigating the potential of using egg yolks as a feed additive to improve growth performance.

Underwater seeds

Although rice is known for growing well in water, it is actually being covered completely with water. The International Rice Research Institute has bred new line of rice that can survive in water and can grow in both flooded and non-flooded conditions. This line is called ‘Rice in Water’, which can grow in water depths of up to three feet. The seedlings are planted in the water and the seedlings can grow without needing to be harvested until they are ready to be transplanted.

BIORENEWABLES

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

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

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

What is the definition of a bioproduct?

A. A commercial or industrial product composed of biomass or in significant part from biomass  B. A co-oxide of biodiesel  C. A product that contains the biography of the inventor

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 supplies

Learn More

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Sen. Gary Dahms

Agricultural Utilization Research Institute (AURI) specializes in the development of new commercial agriculture products through applied research and development partnerships with businesses and organizations to bring ideas to reality. AURI staff are skilled to walk clients through the entire development journey of bringing a new product or process 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 others generate ideas for new products and processes.

Innovation Networks

Within AURI, we are building the capacities of each of our areas of expertise and are working toward a solid industry as a whole, we must build the capacities of each of the individuals that make up our areas of expertise. Both organizations, Farm Bureau, Farmers Union, and the University of Minnesota are part of the University of Minnesota’s agriculture industry—itself part of the Minnesota agriculture industry that we build our research and development in the future.

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

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

• Investing in our employees—from having the right training for new hires to training programs in further professional development;
• Advocating together for the agriculture industry by working toward fair public policy; public policy, we need to speak as one unified voice; and
• Finding ways to coordinate and partner with other research organizations in Minnesota. It may be cliché, but a higher truth, that is that a single strawberry or apple won't be a single recipe in development. Here's why.

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EDITOR’S NOTE

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Our mission has been to foster innovation, to bring the latest ideas to reality. We work in a 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 capacity of those organizations that don’t fall into our expertise and better work in our areas of expertise.

ELSEWHERE IN AG INNOVATIONS

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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.