



Ag Innovation News

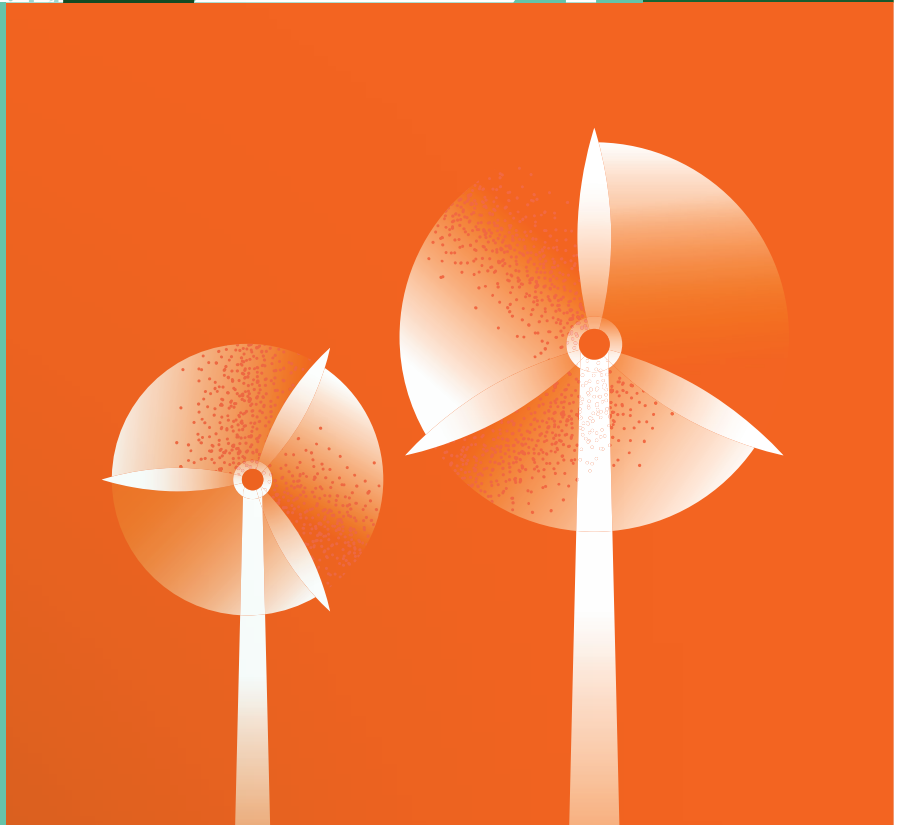
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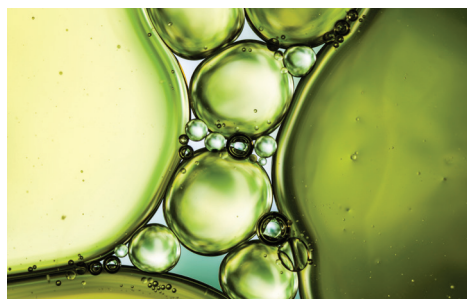


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THIS ISSUE OF
AG INNOVATION
NEWS HIGHLIGHTS
AURI'S
ACHIEVEMENTS
IN 2023. WE
HOPE THIS NEW
ANNUAL OVERVIEW
FURTHERS THE
UNDERSTANDING
OF OUR MISSION
AND WORK.

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With 2023 behind us, I wanted to take this opportunity to reflect on AURI's accomplishments and future impact on Minnesota's agricultural sector.

In FY23, we worked on 220 projects in the areas of Food and Bio-Industrial Products, including renewable energy. I am extremely proud of the impact AURI contributed to the economy over the past five years, with \$261 million in new annual sales, \$147 million in capital invested and 451 jobs created or retained. Even more encouraging are the estimated future impacts this work can have for Minnesota, including 929 jobs created/retained and new capital investment of \$363 million.

We saw significant advancement in the area of bio-industrial products. This past December we hosted the Minnesota Renewable Energy Roundtable, which focused on the emerging hydrogen-based 'green economy' with applications in fertilizers, e-fuels and sustainable aviation fuel. Speakers included Pete Wyckoff of the Minnesota Department of Commerce, Dr. Jennifer King of the National Renewable Energy Laboratory, Mike Jensen of Xcel Energy and many other industry leaders.

AURI installed bench-top fermentation capabilities in FY23 and engaged in new projects in this area. Fermentation uses agricultural feedstocks and ag-derived coproducts to create many different types of biobased products through biological processes that are more sustainable alternatives than petroleum-based products. We also worked with the Minnesota Department of Transportation, Minnesota Department of Agriculture and other partners to develop environmentally friendly mats and erosion control logs using industrial hemp instead of plastic to support road construction project needs.

AURI's food team conducted dozens of projects last year, ranging from industry initiatives to small client projects. As part of AURI's annual Ag Innovation Partnership Program, the food team studied the challenging economics of shared-use commercial kitchens in Minnesota, while on the client side, a couple of project examples include assisting the Somali-focused food company, Hoyo SBC, and local artisan cheese company, CannonBelles.

As you'll see in the following pages, we are well on our way to reaching our goal: being an economic catalyst and delivering \$500 million in economic activity for Minnesota by 2026. I look forward to sharing our progress with you in the years ahead as we take a relentless approach to driving impactful outcomes.

On a final note, I would like to thank Louise Eischens (see back page) for her remarkable 31 years of service to AURI. It's the dedication of employees like Louise that makes AURI a special place to work. Celebrating our collective and personal contributions continues to inspire me and the AURI team.



This quarter, *Ag Innovation News* (AIN) highlights AURI's first-term Board Director, Minnesota State Representative Samantha Vang. Representative Vang is Chair of the Agriculture Finance and Policy Committee and serves on the committees for Environment and Natural Resources Finance and Policy, Higher Education Finance and Policy, and Legacy Finance. In this edition of AIN's Board Q&A, she shares her vision for helping Minnesota become more resilient.



Can you share a little about your background?

I was born and raised in North Minneapolis, am a proud daughter of Hmong refugees and a Gustavus Adolphus graduate with a BA in Political Science and Communication Studies. As refugees, my parents only knew of farming with their hands to sustain our family, so I grew up helping my parents grow produce on rented land to feed our family.



Why did you want to join AURI's board of directors?

AURI is a hidden gem for the ag community here in Minnesota. I do not think there's another organization like AURI that exists outside of the state where there's a more innovative and direct service approach to support farmers and entrepreneurs in actualizing their agricultural products.



What do you think is the biggest challenge facing farmers today?

This is hard, but as one of the younger members of the legislature, I understand the difficulties in trying to get a head start in industries such as farming. Like many industries, we are always looking at how we can continue to sustain our workforce and with an aging farming population, we need to be able to support the next generation of farmers.



How can Minnesota best support its agricultural industry?

I think Minnesota has a ton of great resources that many farmers already utilize and are so popular, ranging from research to development to commercialization. The state can continue to ensure we maintain the infrastructure capacity to support more farmers in gaining access to these resources.



What are your goals as a new board member?

To learn about exciting new developments and build new connections with ag industry leaders.



Which ag-related issues are most important to you?

There are many, but the goal is to build and maintain resiliency, whether that's in the workforce, in the face of climate change, or learning from lessons of the pandemic and ensuring a strong food system. A lot of my work has focused on diversifying the industry and supporting farmers who lack support. I recently created a program to help small farmers buy and own land. It's modeled after homeownership, where first-time home buyers receive down payment assistance. Instead of buying your first home, it's for buying your first farmland.



What would you like to achieve in your current term with the Minnesota legislature?

I always see agriculture as the basic building block of our economy, from feeding our population to creating energy that fuels our economy. I want to continue to strengthen those areas as agriculture remains a critical component in feeding the world and providing sustainable energy to our state.



What is something Minnesotans might be surprised to learn about you?

I speak Japanese and initially sought a career in foreign service.

Biobased Solutions: A Priority for Minnesota's Agriculture Economy in 2023

In 2023, the Agricultural Utilization Research Institute (AURI) worked on several exciting biobased solutions to promote the sustainable production of renewable products using Minnesota-grown feedstocks. Finding new ways to replace petroleum-based products, like plastics, with renewable alternatives will be key to growing Minnesota's agriculture economy while meeting growing consumer demand for more sustainable options. During the past year, AURI invested in equipment, resources and capabilities to help create value and jobs in the bio-industrial sector across Minnesota and the upper Midwest.

AURI's researchers and scientists led 60 bio-industrial projects last year, including 25 new initiatives.



Compelling work is being done around anaerobic digestion. Anaerobic digestion is a process by which bacteria break down organic matter in a digester to produce biogas—a mixture of methane and carbon dioxide—and digestate. Biogas can be used as an energy source for renewable natural gas, heat, electricity, and transportation. The digestate is a nutrient-rich residual material that can be composted, applied to land, and used as livestock bedding, among other applications.

There is renewed interest in this technology, especially in Minnesota. The state ranks eighth in the nation for biogas production potential according to the American Biogas Council. Anaerobic digestion opportunities and projects are emerging at a rapid pace around the country. According to Fairfield Market Research, global revenue in the field is projected to grow to \$18.5 billion by 2027, up from \$7 billion in 2020.

Minnesota has an abundance of agricultural products that work with anaerobic digestion, including cow manure, food processing waste, and dairy processing waste. Further, the state is rich with other feedstocks. Supporters hope that anaerobic digestion can be a key contributor to Minnesota's ongoing efforts to reduce greenhouse gas and carbon emissions as part of the state's Climate Action Framework.

Megan Lennon, energy and environment section supervisor- Ag Marketing and Development Division for the Minnesota Department of Agriculture, notes:

“When these factors align, renewable natural gas and anaerobic digestion are elevated to the forefront and seen as a key solution to meeting various climate change goals. Anaerobic digestion is also part of a solution for a variety of different sectors, not just agriculture, which are hard to decarbonize. I firmly believe the deployment of anaerobic digestion is going to increase in the short term.”

AURI works with producers and developers in the anaerobic digestion landscape, directly advising industry clients and indirectly supporting other entities. In 2023, AURI provided support and guidance on commercial development and feasibility analysis questions, as well as feedstock analysis and general business growth planning.

At its Waseca and Marshall, Minnesota lab facilities, AURI expanded its capabilities to better serve clients interested in anaerobic digestion. AURI has two pilot-size anaerobic digesters in Waseca available to clients to analyze agricultural feedstocks for gas production potential to help de-risk business decisions. In Marshall, clients can use the Biomethane Potential equipment to test small quantities of feedstocks for methane potential to gather valuable data on optimal methane gas production before committing additional investment and time.

AURI's team also assisted clients by evaluating digestate for fertilizer characteristics and advised on best practices for separating the nutrient-rich solids from liquids to improve efficiency in handling and transportation.



AURI engaged in several industrial fermentation projects last year. The process uses agricultural feedstocks and ag-derived coproducts to create many types of biobased products that are more sustainable alternatives than petroleum-based products. Large-scale fermentation projects can create new market opportunities for agriculture producers. AURI is excited to contribute to the development of fermentation projects that promote vitality in rural communities throughout Minnesota. Further development and exploration in this area using renewable feedstocks and circular approaches is a proven way to lower greenhouse gas emissions.

Several years ago, AURI's team assisted Alise and Lucas Sjostrom and Alise's parents, Jerry and Linda Jennissen, when they started Redhead Creamery in Brooten, Minnesota. In addition to providing professional guidance in business start-ups and product cost-share, AURI also advised on developing experimental batches of cheese and nutrition labels. In 2023, scientists helped identify a commercial yeast provider with proven capability to transform milk and cheese processing products into ethanol alcohol byproduct streams through fermentation.

The Chippewa Valley Ethanol Cooperative (CVEC) in Benson, Minnesota, has about 975 members and produces nearly 50 million gallons of ethanol annually. The operation produces both fuel and food-grade alcohol. CVEC constantly explores new markets and opportunities, extending value to its members and local corn producers. AURI and CVEC have been longtime collaborators on a variety of value-added projects. Last year, CVEC donated equipment to advance AURI's capabilities and then explored the viability of different fermentable feedstocks. With this testing, AURI was able to provide quality data on the fermentation potential of these feedstocks and determine if there could be additional feedstock streams into the fuel plant system. For a smaller ethanol plant like CVEC, tapping new revenue streams and finding new uses for agricultural products is critical for sustainable operations.

“The relationship between AURI and CVEC has been greatly beneficial. One of the most advantageous things about working with AURI has been the access to new innovative thinking

and technologies. Their team has been helpful in brainstorming and identifying the challenges and the process of bringing new ideas to an industrial scale. Access to AURI's network of entrepreneurs and experts has helped us find new markets and new revenue, which is so important to our members and community,” says Chad Friese, the general manager of Chippewa Valley Ethanol Cooperative.

Finally, AURI joined the bio-industrial industry group BioMADE in 2023. Based in Minnesota, the public-private partnership is working to catalyze the transformative bio-industrial manufacturing movement in the United States. Membership in the group will help AURI explore new innovation areas related to fermentation to positively impact the state's value-added agriculture sector.



AURI's team worked last year to continue finding new uses and new markets for industrial hemp. One emerging area is in the road construction industry. AURI continued its work with the Minnesota Department of Transportation, Minnesota Department of Agriculture, and other partners to develop a series of environmentally friendly mats and erosion control logs. The Legislative-Citizen Commission on Minnesota Resources (LCCMR) funded the project.

AURI also collaborated with Green Fox LLC in Kimball, Minnesota. Ben and Ellie Fox are constructing a 100,000-square-foot hemp processing facility that will create fibers, oils, hemp hearts, and hurd. The operation will open in early 2024. AURI provided business planning and technical assistance.

“AURI has been such an incredible resource with this project. The team has greatly helped us with our general business planning and process improvement. They have been invaluable in helping us establish new markets for the hemp we grow,” says Ben Fox, the president of Green Fox LLC.



2023 Minnesota Renewable Energy Roundtable Highlights Rural and Ag Opportunities in Hydrogen Economy

Using hydrogen as a source of clean energy is central to decarbonizing many fossil fuel-dependent industries and a pathway to a healthier, cleaner planet. Transitioning to this hydrogen economy is also a potential once-in-a-lifetime opportunity for Minnesota’s rural communities and agricultural producers.

The Agricultural Utilization Research Institute (AURI) hosted its annual Minnesota Renewable Energy Roundtable in Sauk Rapids, Minnesota late last year to discuss the current landscape of the hydrogen economy and the work being done in agriculture, power, transportation, and other sectors to catalyze and innovate here in Minnesota.

Researchers, scientists, academics, business leaders and government officials gathered for the daylong conference to share ideas, discuss strategy and network with the common goal of establishing Minnesota as a leader in knowledge and use of renewable energy.

“There is a lot of interest and energy in this space. The next question is, what can we do and how can we help move this forward?” says Shannon Schlecht, AURI’s executive director. “Minnesota is already a leader in ethanol, so why can’t we lead in green hydrogen as well?”

Pete Wyckoff is the assistant commissioner of federal and state energy initiatives for the Minnesota Department of Commerce. He discussed recent federal and state laws that are accelerating the advancement and adoption of clean hydrogen as the world works toward achieving the goal of net zero emissions by 2050.

The recently passed Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA) are game changers in the energy sector, according to Wyckoff. Transitioning to cleaner power generation and transportation is also intertwined with rural economic development. The IRA for example is the largest climate action law ever passed anywhere “and it is not even close,” Wyckoff says. The law includes 135 different programs and billions of dollars in federal grants, loans and tax credits to support hydrogen in areas like fertilizer, green steel and as a power source. There are innumerable ways for Minnesota’s businesses to take advantage of the different tax credit incentives in the advancement of hydrogen.

He detailed a scenario for an individual who starts a business producing green energy from renewable sources like wind or solar energy. The business then turns that energy into hydrogen and stores the hydrogen before ultimately turning it into sustainable aviation fuel (SAF). That business has the potential to collect more than five different tax credits throughout the process.

“There is a lot of federal support for growing the green economy in Minnesota,” Wyckoff says. “There are also questions to answer about what we want that economy to look like. Environmental justice needs to be front and center in that discussion as we wrestle with and solve those issues.”

The discussion then shifted to how Minnesota stands to benefit from continued developments in green hydrogen. Scientists and climate researchers agree that industrial decarbonization on a large scale requires progress in four categories: renewables, geologic storage, access to raw materials and existing infrastructure for end use.

According to research conducted by Dr. Jennifer King, a research engineer at the National Renewable Energy Laboratory, Minnesota has the building blocks in place in each of the four essential categories to quickly emerge as a national leader in this space. She shared research she conducted that argues Minnesota can be the top state in the country for green hydrogen production by 2035 with the right course of action. The state is ideally located for clean industrial applications and has access to low-cost renewable energy sources. The geologic storage and existing infrastructure are in place. More progress can be made through co-locating hydrogen production with an end use, like steel.

“Transporting and storing hydrogen is very costly so if you can use hydrogen where it is produced you can start to see the costs come down quickly. Co-locating is how Minnesota is going to become very cost competitive,” King says.

One of the most exciting developments in the evolution of the hydrogen economy is already underway. The federal government created a network of regional hydrogen hubs. Minnesota is part of the so-called “Heartland Hub” along with North Dakota, South Dakota, Wisconsin and Montana. The U.S. Department of Energy has committed up to \$925

million to the Heartland Hub for projects that are expected to reduce carbon emissions by roughly 1 million metric tons per year, or the equivalent of 220,000 gasoline-powered cars. Xcel Energy is a leading member of the Heartland Hub. In a proposal to the U.S. Department of Energy, leaders of the Heartland Hub laid out plans to produce hydrogen for use in fertilizer, power and heating.

Mike Jensen, director, Clean Fuels PMO for Xcel Energy, says his company sees hydrogen not only as a tool to provide clean energy for Xcel Energy's customers but also to decarbonize high greenhouse gas producing industries like steel, fertilizer and aviation fuel.

“Hydrogen as a substitute for natural gas is so versatile and it has great potential. We are going to be using hydrogen in a lot of different ways in the next several years and we are going to keep pushing forward,” says Jensen.

Another area for rapid advancement in the use of hydrogen is as a clean fuel. Dr. William Northrop, a professor of mechanical engineering at the University of Minnesota, says there is huge e-fuel potential for Minnesota-made biofuels that would further reduce CO2 emissions. Advancements are happening very rapidly in that work.

Several innovative companies from around the world working on green hydrogen related innovations presented at the 2023 Minnesota Renewable Energy Roundtable. Tomoyuki Koide, from the Tsubame BHB in Japan, talked about how his company is working to develop small scale production of green ammonia with a goal of “manufacturing ammonia at a low temperature, low pressure, and a small scale, so it will be possible to provide ammonia efficiently and at low cost.” He pointed out that all of the ammonia in Minnesota was produced outside the state. On site production of ammonia minimizes storage needs, shrinks the supply chain, and decarbonizes the industry.

Karen Baert, the CEO and co-founder of Ammobia, discussed her San Francisco-based company's process for clean ammonia production for use in fertilizer and as an energy carrier.

Ammonia is the second-most produced chemical in the world with a \$200 billion market. There are only 400 production plants around the world, however. She added that hyper-centralization leads to market volatility, higher prices, increased transportation costs and security risks.

“Farmers in the Midwest are paying way too much for grey ammonia,” Baert says.

Through Ammobia's process for production, ammonia can be produced using renewable fuels in a decentralized network of facilities across the globe. Cleaner, cheaper ammonia would significantly expand the market and has the potential to reduce up to five percent of global greenhouse gas emissions.

Mauricio Medici, the licensing and business development manager for Stamicarbon, discussed his company's efforts to design, license and develop urea plants for the fertilizer industry that reduce emissions. Ammonia is a key player in decarbonizing the food value chain both as a fertilizer and as an energy source for transportation.

Nathalie Beken, an investment associate at Azimuth Capital Management, stated their firm invests in low-carbon fuel projects and is actively seeking companies to partner with that produce low-carbon hydrogen, ammonia and sustainable aviation fuels. She said there is excitement among investors in the emerging areas of green hydrogen and ammonia that will spur future investment.

Inder Singh, CEO and founder of SBI of Edmonton, Alberta, presented a process for converting ethanol into hydrogen. This process, which SBI has already successfully demonstrated at the pilot level, could allow ethanol to be used as a hydrogen carrier to supply the emerging market for hydrogen in heavy-duty vehicles powered by fuel cells.

Mark Ritter, grant administrator at GEVO Inc., discussed what his company is doing in the sustainable aviation fuel space and its Farm to Flight program to provide incentives to farmers to grow low carbon intensity corn through a grant from the United States Department of Agriculture.

The 2023 Minnesota Renewable Energy Roundtable was sponsored by Compeer Financial, Avisen Boutique Business Law, Great River Energy, CenterPoint Energy, Xcel Energy, the Minnesota Department of Agriculture and Great Plains Institute.



AURI'S FOOD TEAM GENERATES IMPACT IN 2023

The Agricultural Utilization Research Institute's (AURI) food team provides consulting and technical services to help bring business ideas to reality. Last year, the team worked on 114 projects throughout the state, split between private commercialization projects and public initiatives. Of those, 46 were new endeavors launched during the fiscal year.

As part of AURI's annual Ag Innovation Partnership Program, the food team studied the challenging economics of shared-use commercial kitchens in Minnesota. Shared-use commercial kitchens are critical for home-based food businesses to increase production to meet growing demand. In recent years, several commercial kitchens in Minnesota have gone out of business or changed hands. Further, a perception exists that there is not enough shared-use commercial kitchen space for growing cottage food businesses in some rural Minnesota areas.

A key takeaway from the research was that knowledge and resource gaps exist among commercial kitchen owners and users.

One research partner noted: "The answer is not always that we need more [commercial kitchen] space. Sometimes, the industry needs a better understanding of what is in the market. There are idle facilities in some communities, but there are also kitchens in restaurants, schools, and churches that are not being used throughout the day."

Final results were shared publicly via the AURI Connects Webinar Wednesday platform, with the *Minnesota Shared-Use Commercial Kitchen: Final Report* available at [AURI.org](https://auri.org).

In the spring of 2023, AURI's team worked with food company Hoyo SBC to provide technical assistance related to products for school lunch programs. Hoyo, which means "mother" in Somali, was founded to employ and empower Somali women. It hires these moms to make one of their favorite dishes, sambusa, so they can share a piece of their culture with the broader community while also providing an income stream for their families. Sambusa is a triangular pastry hand-folded and stuffed with meat or lentils, fried and then frozen for distribution. The products are sold wholesale, but the company recently transitioned most of its production



"AURI has helped us at Hoyo ever since we needed nutrition facts to add to our retail packaging several years ago. As the business has grown, we have continued to turn to AURI for nutritional analysis with new products, lunch crediting for public schools and advice on how to scale our small social enterprise. We're so grateful for their assistance throughout our journey! We know AURI is an organization in our corner and there to help us when we need it."

Luke Snider, Director of Operations,
Hoyo, SBC

46

NEW PROJECTS
AND INITIATIVES
OPENED

55

PROJECTS AND
INITIATIVES
CLOSED

114

TOTAL PROJECTS
AND INITIATIVES
SERVICED

“The AURI team are amazing people. They are so willing to share knowledge and resources in this industry to help food businesses succeed. They have done amazing work!”

Shan Columbus, Founder,
Maytown Foods, LLC

to provide sambusa for Minnesota’s school lunch program. AURI optimized formulas and prepared necessary calculations and documents to meet school meal guidelines. The food team also provided resources and connections to Hoyo as it transitioned to a larger production space.

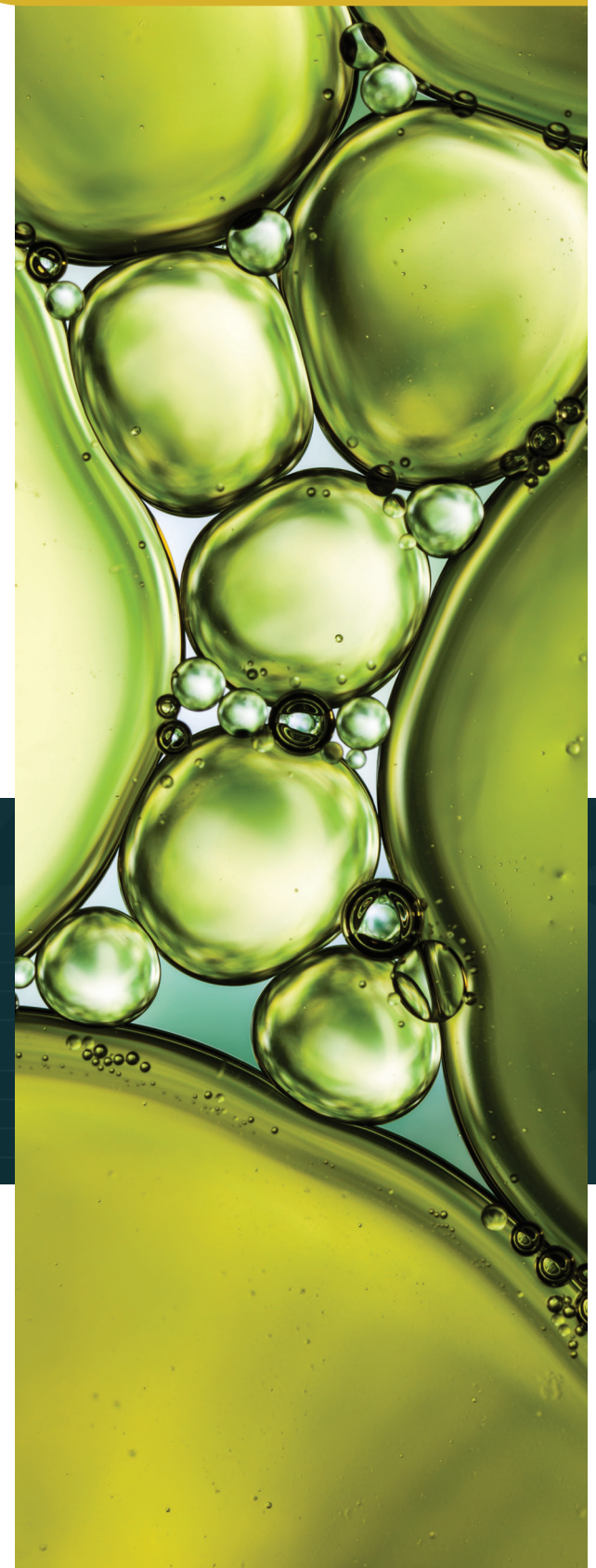
AURI also worked with CannonBelles, located in Cannon Falls, Minnesota. CannonBelles produces award-winning artisanal cheeses at its manufacturing facility. It is also home to CannonBelles Coffee and Ice Cream, which sells cheese and other local products. After making beer and wine together for years, friends Deeann Lufkin, Jackie Ohman, and Kathy Hupf started making cheese in the fall of 2011. They improved their formulations based on feedback from friends and family and extensive research about cheese making.


In the fall of 2015, they were approached by the Director of Economic Development and Planning for Cannon Falls and formed a partnership leading to the creation of a manufacturing facility. In 2022, their dream of opening their own plant in Cannon Falls became a reality. AURI’s food team worked with CannonBelles to complete analyses and nutrition labels for cheddar cheese curds, enabling sales into a local school lunch program. In addition, AURI completed nutrition labels for several other varieties of cheese sold at retail in various locations.

“The team at AURI is wonderful! They were extremely helpful and patient with us. The work they did significantly impacted getting us into new markets.”

Deeann Lufkin, Co-Founder, CannonBelles

AURI supports the food ecosystem and collaborates with several entities in multiple ways each year to assist food businesses beyond its project work. Ecosystem support last year included training events, food safety guidance and more. In 2023, members of AURI’s food team shared presentations at several events, including but not limited to the Ancient Grains Conference, Naturally MN’s Food and Ag Ecosystem Summit, The Good Acre’s CPG Resource Round-up for Emerging Food Businesses, and the FEAST! Wholesale and Retail Tradeshow Q&A. Presentation topics ranged from “Conquer Your Costs,” “Understanding Food Product Shelf-Life for Scaling Businesses” to “AURI Food Team Capabilities & Services.”





EXCITING OPPORTUNITIES FOR AURI AND COLLABORATORS LIE AHEAD

The future for value-added agriculture looks bright, with many opportunities for AURI to expand markets and positively impact Minnesota's agriculture sector. Minnesota has advantages in many areas: we have strengths in production and processing, we are well connected from the producer level to the corporate level via various coalitions, and we have an innovative spirit and history of success. AURI will look forward strategically to prioritize focus areas, build pipelines of clients and collaborators, and continue helping to build our ecosystem for new and continued market growth of agricultural products.

New Resources

After roughly 30 years in the same location in Waseca, Minnesota, AURI transitioned to a new home in January 2024. The new AURI facility roughly doubles our previous pilot capabilities and allows us to add new equipment to aid the commercial market expansion of ag-derived products. We added capabilities around anaerobic digestion, biomass drying, decortication, and oilseed pressing at an annex site a few years ago. Bringing these capabilities and our densification and processing operations under one roof creates new synergies and efficiencies and enables us to better fill scale-up gaps for bio-industrial client projects and initiatives.

AURI's Marshall site is undergoing a major upgrade with new equipment and/or replacement of older equipment. We recently added small-scale fermentation processes and biomethane potential analysis. In the year ahead, the analytical lab will offer new mass spectrometry technology to serve a greater number of projects. These new instruments greatly enhance our capabilities to perform work beyond our current means while providing Minnesota food and bio-industrial entrepreneurs and businesses with the data they need to make informed decisions in developing new products and processes. Additionally, an elemental analyzer and inductively coupled plasma (ICP) instrument will assist work in nutrient recovery (nitrogen, phosphorous, potassium) and biobased fertilizers.

In summary, the Minnesota legislative investment for new equipment and upgrades to laboratory sites was a major catalyst in improving AURI's capabilities and better servicing Minnesota's innovative agriculture sector.

Partnerships/Collaborations

AURI fills a unique role in collaborating across the value chain to accelerate opportunities. One area we are particularly proud of is our ability to connect the dots across and between industry challenges and

opportunities. While we do this at a 1:1 level with businesses, we also see great value in broader industry collaborations to build possibilities for the agriculture industry.

AURI sits on the Executive Council of MBOLD, a coalition of 11 Minnesota-based companies and entities, and co-leads efforts in entrepreneurship and innovation. AURI works to help scale high growth food and ag companies through MBOLD's Bold Growth program, which has included nine companies to date. AURI also is engaged with MBOLD members around protein sustainability to build upon Minnesota's rich protein assets.

The United States Department of Agriculture (USDA) is a prominent partner in pursuing innovation opportunities through its Agricultural Marketing Service, offering local and regional meat processing assistance programs. AURI is one of seven USDA-designated technical assistance providers with a partnership extending through December 2026. The partnership builds upon the state of Minnesota's support in developing a more resilient local and regional meat processing sector. Additionally, USDA's Rural Development named AURI one of nine Agricultural Innovation Centers across the country to work with producers in developing value-added opportunities for crop and livestock production. AURI has also found repeated success via the USDA Rural Cooperative Development Program, allowing AURI to leverage state funds with federal dollars to assist cooperatives and producer-owned entities.

Finally, BioMADE is a relatively new endeavor based in Minnesota that is working to advance a bio-industrial manufacturing industry in the United States. AURI joined in 2023 and looks forward to working with BioMADE and the agricultural industry on analyzing various agricultural feedstocks for bio-industrial purposes through this collaboration, which consists of over 250 entities. Investment from the State of Minnesota and the federal government to build BioMADE's first fermentation scale-up site in Minnesota puts our state and agricultural sector at the forefront of a new wave of bio-manufacturing.

Hydrogen and Agriculture

Carbon intensity and related policy incentives are now regular topics of conversation. Looking ahead, AURI is exploring new ways for agricultural feedstocks and byproducts to contribute to the circular economy— thereby creating new rural industries while also reducing environmental footprints. Green fertilizer is an exciting area for Minnesota. Since we do not produce synthetic fertilizer in the state, industry advancement in this area can create and retain wealth across our rural communities. The University of Minnesota is at the forefront of green ammonia and its potential applications. Meanwhile, AURI is using those foundational efforts to analyze the potential for a viable green fertilizer industry using green ammonia and carbon dioxide from biofuel production. Additionally, the recovery of essential excess nutrients from agricultural value streams has the potential to be recycled for feed inputs and fertilizer applications to add new value.

Exploring how AURI can advance sustainable aviation fuel (SAF) and renewable diesel is also intriguing. AURI seeks to fill information gaps to ensure success for those venturing down these paths. Hydrogen is a key ingredient in these processes. Identifying multiple markets for hydrogen—from green fertilizers to SAF to renewable diesel and fuel cells—will help de-risk future investment.

In closing, the future is full of opportunities. AURI looks forward to both driving and supporting these exciting areas to build new value and markets for our state's important agricultural sector.

WHERE ARE THEY NOW?

By Dan Lemke



Turning an idea for a food product into a viable business that stands the test of time is not for the faint of heart. The Agricultural Utilization Research Institute's (AURI) food team helps tilt the odds. One Minnesota entrepreneur, who recently found success in the marketplace with help from AURI, is Junita Flowers, founder of Junita's Jar. She produces cookies with a cause.

Flowers grew up in St. Paul, Minnesota. Some of her favorite childhood memories come from spending time in the kitchen with her family.

“Being in a family where you spend a lot of time in the kitchen, it just becomes a part of who you are, part of your DNA,” Flowers says.

Years later, Flowers found herself in an abusive relationship. She turned to baking to manage the chaos in her life, because time in the kitchen connected her to those positive childhood memories. As the relationship soured, she wondered if the love of baking could offer an opportunity.

“I found myself a single mom and I felt like I had hit rock bottom,” Flowers recalls. “I thought, I can't go any lower, so why not take a chance and try entrepreneurship and maybe see what you can do with this cookie thing?”

Flowers always believed she would run her own business. Her professional career was spent serving youth and families through nonprofits and

community service organizations. She did not expect her business inspiration would come from her love of baking.

Flowers founded Junita's Jar in 2018. She turned to AURI for help with nutrition labeling, analytical testing, business development and scale-up. She produced bite-sized cookies inspired by childhood recipes.

At the start, Flowers used the business to promote healthy relationships.

“We used our platform initially doing what we called cookies and conversations,” Flowers says. “We would speak to college students about the impact of relationship violence. We used cookies as a way to get them to come to the meeting and as a tool to connect people.”

The COVID-19 pandemic changed plans, but not Flowers' determination. Junita's Jar is now a nationally-distributed cookie company based in Minneapolis.

Flowers started by making cookies herself in a commercial kitchen, but in 2023, she moved to a third-party manufacturer. The cookies, which come in chocolate chip, oatmeal brown sugar and oatmeal peanut butter chocolate chip flavors, are now distributed across the country, including Caribou Coffee airport locations, numerous hotels and 350 Target stores nationwide. She also is working with a major airline on an opportunity in 2024.

Flowers started another project with AURI to further advance her business.

“I love seeing previous clients on our list of upcoming projects because it means that they're still being successful as well as expanding their business opportunities,” says AURI Food and Nutrition Scientist Ben Swanson.

Finding success in the food business is no small feat. AURI Senior Food Scientist Lolly Occhino says that in 2022, Minnesota had over 7,300 registered cottage food producers, and there is no shortage of competition.

“There are a lot of companies out there looking for assistance. AURI is continually looking for ways to expand its reach and be more efficient in supporting those businesses,” Occhino says.

Flowers says hers is a cookie company that is a message of hope. Packages are colored purple in support of ending domestic violence.

“Junita's Jar is a platform for me to be able to inspire women to live their best life and take a chance on themselves,” Flowers explains.

Additional information about Junita's Jar and product locations can be found at junitasjar.com. You can also check out a recent podcast with Junita at auri.org.

ABOUT AG INNOVATION NEWS

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LOUISE EISCHENS RETIRES AND REFLECTS ON AURI AFTER 31 YEARS

In December 2023, AURI celebrated Louise Eischens, project and technical administrative coordinator, on her retirement after 31 years of service to AURI. Eischens worked in AURI's office in Marshall, Minnesota, providing kind, caring and professional service to the organization.

Eischens grew up on a small farm near St. Leo, Minnesota, allowing her to be involved in agriculture from a young age. She completed the Minnesota Farmers Union Youth Program, where she attended summer camp and joined its summer staff. Upon high school graduation, Eischens pursued the General/Agricultural Secretary program at Minnesota West Community and Technical College in Granite Falls, Minnesota. Her first industry job was as a Program Assistant for the United States Department of Agriculture's Farm Service Agency in Yellow Medicine County. From there, Eischens worked as a Secretary at the Southwest/West Central Service Cooperative in Marshall. In June 1992, Eischens joined AURI as an Administrative Assistant.

Throughout her career at AURI, Eischens provided administrative support to the Innovation and Commercialization teams, as well as to the Science and Technology teams. She also helped manage AURI's Marshall office, with most of her work occurring behind the scenes, adhering to internal processes and procedures, providing top-notch customer service, coordinating meetings and logistics and working with staff, vendors and accounts payable.

Eischens has enjoyed seeing the organization grow over the years, expanding its footprint across the state of Minnesota and instituting the Meat Laboratory and the Food Product Evaluation and Sensory Laboratory in Marshall. She also has seen AURI develop two logos, create Focus Areas, update its mission and vision statements, as well as secure several external funding opportunities and patents.

While at AURI, Eischens appreciated attending annual staff meetings and working with colleagues who are passionate about value-added agriculture and AURI's mission. She marvels at the progression of technology since her early days at AURI, as well as the addition of AURI programming, such as the Minnesota Renewable Energy Roundtable, Industry Thought Leaders, AURI Connects and the Ag Innovation Center.

In retirement, Eischens says she plans to spend more time with family and friends and travel to many new places.

"I will miss the camaraderie of the staff and seeing what projects are being worked on," Eischens says. "It's exciting to see what new products will appear in the marketplace, and I look forward to staying in the loop through *Ag Innovation News*. Thank you for letting me be part of this great organization."

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