

LEGISLATIVE

FY2023
AURI
ANNUAL REPORT



Agricultural
Utilization
Research
Institute



“

By partnering with AURI via the New Uses Forum, Compeer Financial looks to improve rural vitality by promoting the exchange of ideas and facilitating the commercialization of Minnesota's entrepreneurs. It's exciting to see some of AURI's innovative work come to fruition through commercialization of new ideas and products. It's a privilege to work with such a great team.”

Aaron Knewtson, VP Food and Agribusiness, Compeer Financial

TABLE OF CONTENTS

1	From the Executive Director
2	Board of Directors
3	At a Glance
4	Client Impact
5	Client Projects
7	Bio-Industrial
9	Food
10	AURI Connects
11	Financial Statement
12	Statement of Activities
13	Looking Forward
15	Active Projects and Progress Report

FROM THE EXECUTIVE DIRECTOR

I'm happy to share the operational results of the Agricultural Utilization Research Institute (AURI) for Fiscal Year 2023 (FY23). As you read through the following pages, I hope it's apparent that AURI is continuously improving and adapting to the marketplace with a laser focus on growing Minnesota's rural and ag economy.

Notable Successes This Year

We worked on 220 projects over the 12 months in the areas of Food and Bio-Industrial Products, including renewable energy. I am extremely proud of the impact AURI contributes to the economy, 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 or retained and new capital investment of \$363 million.

Bio-Industrial

Anaerobic digestion opportunities and projects are emerging at a rapid pace around the country. Minnesota is no different. Our state ranks eighth in the nation for biogas production potential according to the American Biogas Council. Demonstrating how organic materials can produce renewable energy in the form of biogas and fertilizer through anaerobic digestion was the focus of our last Minnesota Renewable Energy Roundtable, which was attended by representatives from the U.S. Environmental Protection Agency, CenterPoint Energy, Minnesota Department of Agriculture and dozens of industry representatives, among others. AURI's two onsite pilot-sized digesters help clients analyze agricultural feedstocks for gas production potential to help derisk business decisions in this re-emerging area.

AURI engaged in several industrial fermentation projects in FY23. Fermentation uses agricultural feedstocks and ag-derived coproducts to create many different types of biobased products through biological processes that are more sustainable alternatives to petroleum-based products. Large-scale fermentation projects can create novel new market opportunities for farmers while significantly lowering greenhouse gas emissions.

Using hemp to control soil erosion is another area AURI contributed expertise in FY23. 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 using hemp instead of plastic to support road construction project needs. The project is funded by the Legislative-Citizen Commission on Minnesota Resources.

Food

AURI's food team conducts dozens of projects each 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. Shared-use commercial kitchens are critical for home-based food businesses to increase production to meet growing demand.

In the spring of 2023, AURI's team had the opportunity to work with a Somali-focused food company named Hoyo SBC. Minnesota has the largest Somali population in the United States with 86,610 Somalis. Hoyo, which means "mother" in Somali, was founded to employ and empower Somali women. It hires mothers 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. AURI optimized formulas and prepared necessary calculations and documents for Hoyo to meet school meal guidelines to enter the school lunch program. The food team also provided resources and connections to Hoyo as it transitioned to a larger production space.

Another example was the AURI food team's work with Cannon Falls based artisanal cheese company CannonBelles to complete analyses and nutrition labels for various cheeses and cheese curds, enabling sales into retailers and a local school lunch program.

New Strategic Plan

This year we put in place a new three-year strategic plan to guide our mission of accelerating the expansion of the agricultural economy by addressing these areas:

- People, Growth and Development
- Maximizing Impact
- Solidifying AURI's Brand and Reputation

Developing and growing employees is key to being a high-performing organization. Setting priorities that deliver optimal results with clear measurements is essential to driving impact and illustrating AURI's value. Better communicating our capabilities and brand promise ensures we meet client and stakeholder needs.

I am confident that working on these three 'pillars of excellence' will enable us to reach our vision: being an economic catalyst and delivering \$500 million in economic activity for Minnesota by 2026. As we implement our plan, I look forward to sharing our progress with you in the years ahead.



Shannon M. Schlecht
Executive Director



MESSAGE FROM AURI'S BOARD CHAIR

In my second year as AURI Board Chair, I'm pleased to share several notable accomplishments for FY23. A few key examples include:

- AURI launched the Agricultural Innovation Center in partnership with the USDA to assist farmers in developing added-value agricultural products.
- We advanced our goal to foster renewable energy opportunities for our state by hosting a Minnesota Renewable Energy Roundtable focused on anaerobic digestion and improving our new pilot-sized anaerobic digester capabilities.
- We expanded our services to small and medium-sized meat processors.
- With federal and state support, we were able to continue to invest in our people, hiring three new staff.
- We completed a two-year process to assess and define our long-term strategy.
- We reviewed our financial resources to facilitate much-needed upgrades in lab equipment.

Our renewed vision, to deliver \$500 million in economic activity for Minnesota by 2026, will advance our mission to accelerate the expansion of the agricultural economy by empowering expanded uses and markets of agriculturally derived products. AURI continues to build on a 30+ year track record while fostering a strong set of values (collaboration, commitment, ingenuity, integrity) that underpin everything we do.

Opportunities to serve Minnesota are great. Our diverse agricultural economy presents opportunities for economic growth anchored by our strong food ecosystem, Minnesota's potential to be the eighth-largest producer of renewable natural gas in the country and leadership in the fast-moving area of protein. These opportunities are accelerated by our strong partnerships with local and federal government, including USDA, MDA, DEED; grower groups like Minnesota Soy and Minnesota Corn; industry coalitions like MBOLD; and other organizations like AgriGrowth and Naturally MN.

The market, technologies, demands and opportunities facing Minnesota have evolved greatly in the last year. I wish to thank the Minnesota Legislature for their continued support and partnership. They generously provided AURI with \$1.8M during the 2023 legislative session to modernize equipment, some of it dating to the 90s, to enable crucial capabilities that will serve client needs into the future.

I believe that AURI is well-positioned to accelerate the growth of MN's agricultural economy and will continue to augment its contributions to the state for years to come.



Federico A. Tripodi
Board Chair



BOARD OF DIRECTORS

Federico A. Tripodi, Chair
At-Large Board Member

Jerry Hasnedl, Vice Chair
Minnesota Farmers Union

Carolyn Olson, Secretary/Treasurer
Minnesota Farm Bureau

Sen. Aric Putnam
Minnesota Senate

Rep. Samantha Vang
Minnesota House of Representatives

Lauren McNamara
Agribusiness, SunOpta

Joe Serbus
Minnesota Soybean Research
& Promotion Council

John Schafer
Minnesota Beef Council

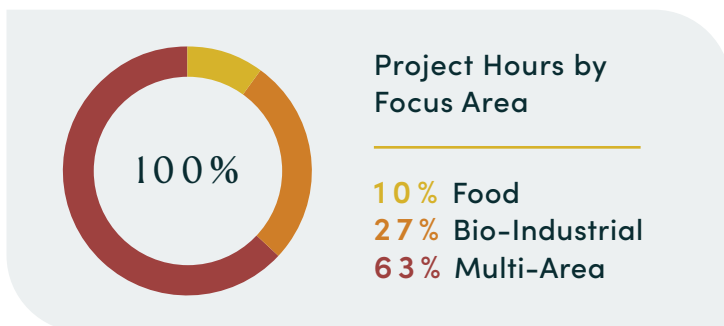
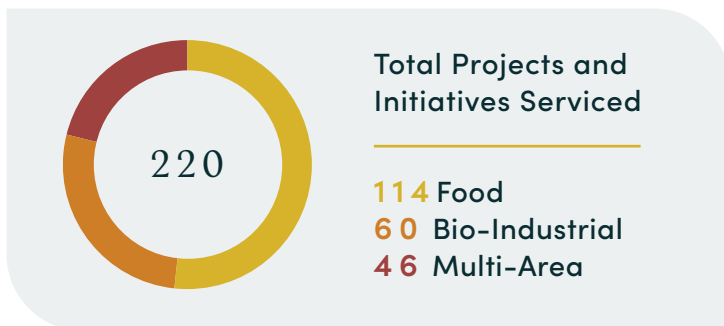
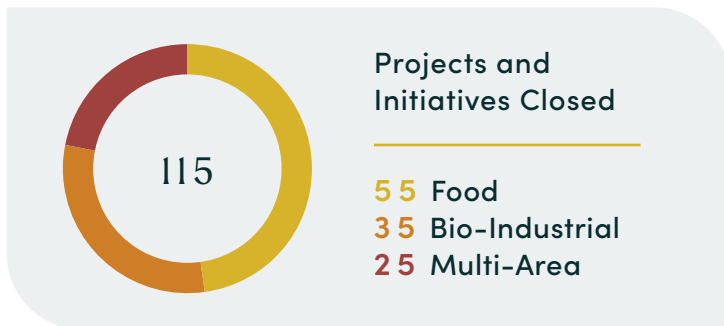
Jon Veldhouse
Agribusiness, Qore

Ken Asp
Minnesota Wheat Research
& Promotion Council

Jeff Grev
At-Large Board Member, Hormel Foods

*Fiscal Year Expenses: \$6,241,598**

Fiscal Year Revenue: \$6,504,181



FY23 Events

- 20 Number of events
- 1,675 Number of participants
- 482 New participants
- 1,028 MN participants
- 42 Number of states represented
- 4 Number of countries represented

EVENTS BY FOCUS AREA

- 6 Food
- 7 Bio-Industrial
- 7 Multi-Area (both Food & Bio-Industrial)

“

AURI has been such an incredible resource. The team has helped us a great deal with our general business planning and process improvement. They have been invaluable helping us establish new markets for the hemp we grow.”

Ben Fox, The Green Fox LLC

Client Impact:

JULY 2018-JUNE 2023

929

Estimated Future Jobs
Created/Retained

\$363,371,602

Estimated Future Capital
Investment

\$261,935,502

Estimated New Gross
Annual Sales

\$147,706,500

Estimated New Capital
Investment

451

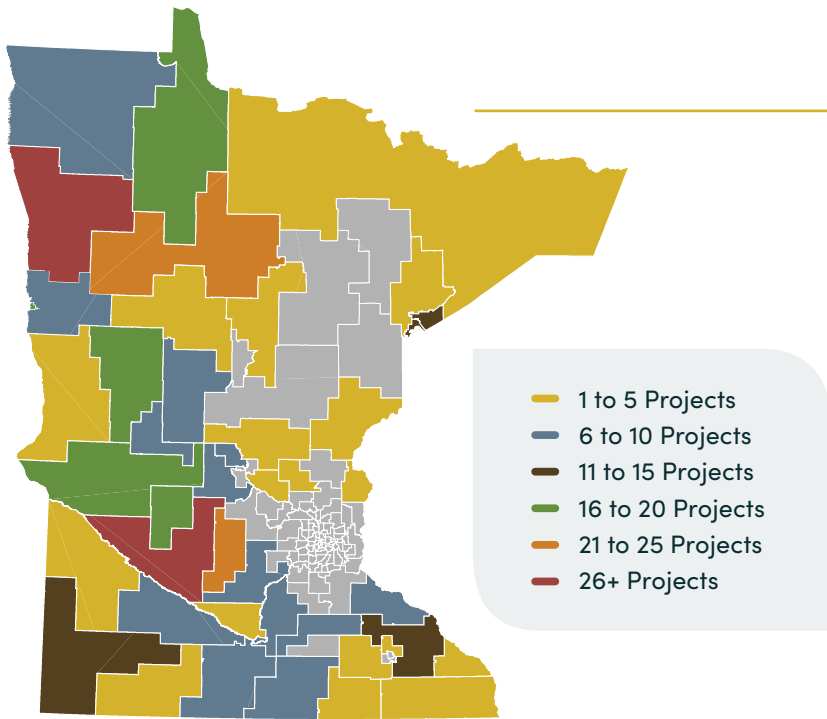
Estimated Jobs
Created/Retained



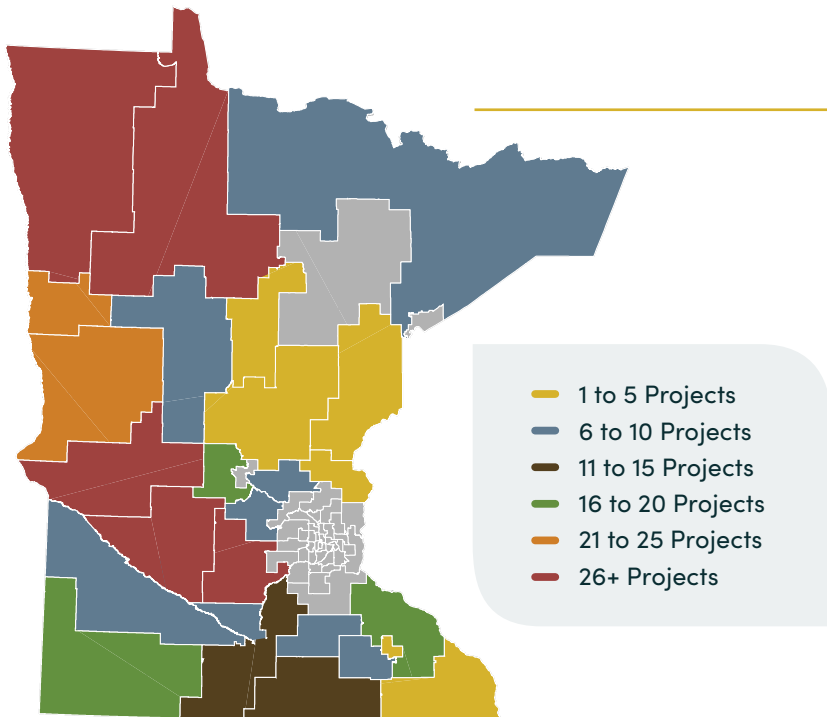
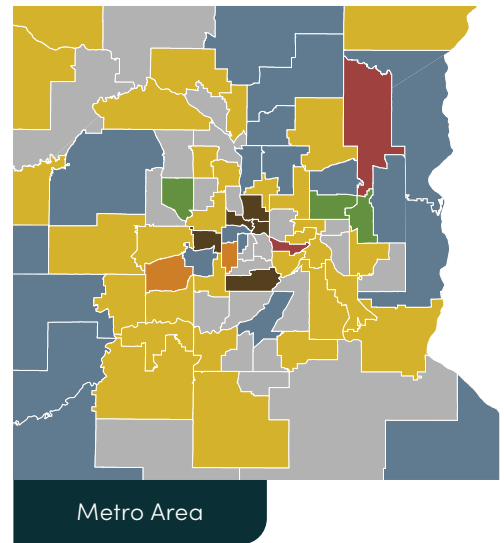
CLIENT PROJECTS WORKED ON

July 2013-June 2023

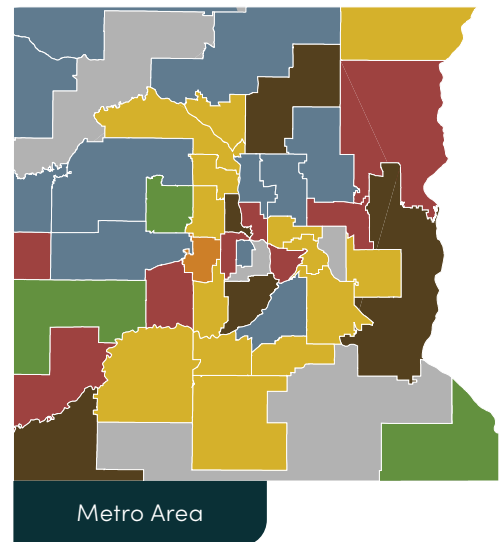
AURI is proud to partner with producers, businesses and entrepreneurs throughout Minnesota. As the map below shows, AURI worked on client projects in most of Minnesota's Legislative Districts between July 1, 2013 and June 30, 2023. The impact of these collaborations was significant to communities throughout the state. AURI also conducted several statewide initiatives throughout the year.



Minnesota House Districts



Minnesota Senate Districts





FOCUS AREAS

Our work across ag commodities and agricultural derived products focuses on two core areas: Food and Bio-Industrial products, as well as Multi-Disciplinary.

The following pages provide an overview of the focus area resources and efforts AURI dedicates to advancing value-added opportunities in each area.

“

AURI was integral in helping us navigate the winding road of becoming a food manufacturer. The food team’s expert advice and direction around formulation, efficiency and product development was priceless. The resources AURI shared were also very valuable and helped us with everything from labeling to filing our FDA process.

Troy Lightfield,
Owner & Founder,
Lightfield BBQ

BIO-INDUSTRIAL

25

NEW PROJECTS
AND INITIATIVES
OPENED

35

PROJECTS AND
INITIATIVES
CLOSED

60

TOTAL PROJECTS
AND INITIATIVES
SERVICED

In FY23, 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 a key opportunity to grow Minnesota's agriculture economy while meeting a growing consumer demand for more sustainable options. During the past year, AURI invested in equipment, resources and capabilities to help create value and jobs across Minnesota and the upper Midwest in the bio-industrial sector.

Anaerobic Digestion

Compelling work is being done in the area of 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. According to the American Biogas Council, the state ranks eighth in the nation for biogas production potential. 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 agriculture 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 in Minnesota's ongoing efforts to reduce greenhouse gas and carbon emissions as part of the state's Climate Action Framework.

Megan Lennon, the Energy and Environment Section Supervisor-Ag Marketing and Development Division for the Minnesota Department of Agriculture, was a featured presenter at the FY23 Minnesota Renewable Energy Roundtable.

"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," Lennon says. "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."



“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 brainstorming and identifying the challenges and the process to bring new ideas to an industrial scale. Having 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 our community.”

Chad Friese, General Manager, Chippewa Valley Ethanol Cooperative (CVEC)

AURI works with producers and developers in the anaerobic digestion landscape, directly advising industry clients and indirectly supporting other entities. In FY23, AURI provided support and guidance on commercial development and feasibility analysis questions, as well as feedstock analysis and general business growth planning. The highlight of FY23 was AURI’s annual Minnesota Renewable Energy Roundtable, a daylong event devoted to the topic of anaerobic digestion. Researchers, academics, entrepreneurs and business leaders joined technology and finance experts as well as representatives from leading utility companies to explore the future of anaerobic digestion in Minnesota.

At its Waseca and Marshall, Minnesota lab facilities, AURI expanded 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 derisk 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.

Fermentation

AURI engaged in several industrial fermentation projects in FY23. The process uses agricultural feedstocks and ag-derived coproducts to create many different 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, the AURI team assisted Alise and Lucas Sjostrom, and Alise’s parents Jerry and Linda Jennissen, when they started Redhead Creamery in Broton, Minnesota. In addition to providing professional guidance in business start-up and product cost-share, AURI also advised on the development

of experimental batches of cheese and nutrition labels. In 2023, scientists helped identify a commercial yeast provider with proven capability to help transform milk and cheese processing products into ethanol alcohol to unlock new value from lower value byproduct streams through fermentation.

The Chippewa Valley Ethanol Cooperative (CVEC) in Benson, Minnesota has about 975 members and produces close to 50 million gallons of ethanol a year. The operation produces both fuel and food-grade alcohol. CVEC constantly explores new markets, opportunities and extended value for its members and local corn producers. AURI and CVEC have been longtime collaborators on a variety of value-added projects. In FY23, 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 they 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.

AURI joined the bio-industrial industry group BioMADE in FY23. The public-private partnership, based in Minnesota, 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.

Hemp

The AURI team worked during FY23 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 project is funded by the Legislative-Citizen Commission on Minnesota Resources.

AURI also worked 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.

FOOD

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

AURI's food team provides consulting and technical services to entrepreneurs to help bring business ideas to reality. In FY23, the team worked on 114 projects throughout the state, split between private commercialization projects and public initiatives. Of those, 46 were new endeavors.

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 it is the industry that 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 the school lunch program. Hoyo, which means “mother” in Somali, was founded to employ and empower Somali women. It hires mothers 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 via wholesale, but the company recently transitioned a majority of its production 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 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,” notes Luke Snider, Director of Operations, Hoyo, SBC.

CannonBelles, located in Cannon Falls, Minnesota, 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 dreams of opening their own plant in Cannon Falls became a reality. AURI's food team worked with CannonBelles in the winter and spring of 2023 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. You can find their cheeses at cannonbelles.com/where-to-buy.

“The team at AURI is wonderful! They were extremely helpful and patient with us. The work they did had a significant impact on getting us into new markets,” says Deeann Lufkin, Co-Founder of 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 this past year included training events, food safety guidance and more. In FY23, members of AURI's food team shared presentations at 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 included, “Conquer Your Costs,” “Understanding Food Product Shelf-Life for Scaling Businesses” and “AURI Food Team Capabilities & Services.”

AURI CONNECTS

20

AURI CONNECTS
EVENTS

1,675

TOTAL EVENT
PARTICIPANTS

482

NEW EVENT
PARTICIPANTS

Throughout FY23, the AURI Connects program continued its dissemination efforts through a variety of platforms for engagement and networking by hosting events encompassing multiple subject areas via its Webinar Wednesday and Fields of Innovation series, as well as signature events, highlighting AURI's work in the areas of food and bio-industrial products. In total, the AURI Connects program hosted 20 different events and brought together nearly 1,700 people, of which almost 500 attendees were new to AURI Connects. These results were due, in large part, to the program's commitment to offering high-quality, wide-ranging and informational topics to AURI's stakeholders and the food and ag sectors.

The Webinar Wednesday series offered education on areas ranging from clean label and ultra-processed foods to shared-use commercial kitchens to helping farmers create new value-added products through AURI's new USDA funded Ag Innovation Center. Beyond the 772 live registrants for Webinar Wednesdays, there were 1,300 YouTube views of webinar recordings, which is a testament to the power of referrals and the valuable information provided.

Meanwhile, the Fields of Innovation event series hosted both in-person and virtual events to bring together representatives from across Minnesota's ag and food value chain. The series aims to create awareness, build capacity and accelerate the commercialization of new and emerging crops and traits, while also highlighting emerging ag opportunities for producers, processors and entrepreneurs. In the 12-month period that comprised FY23, Fields of Innovation explored the topics of sustainability, decarbonization and the value of learning from challenges on the path to innovation.

Finally, an equally important component of the AURI Connects effort is hosting annual signature events, such as the Minnesota Renewable Energy Roundtable (MNRER) and New Uses Forum. Both events offer attendees opportunities to learn about important industry topics and network with other professionals to create connections to advance new ideas and products. The 2022 MNRER focused on anaerobic digestion and offered a hybrid attendee experience, while the 2023 New Uses Forum covered what fermentation holds for the future, provided perspectives on food and health connections and discussed how companies should navigate financial markets in the current environment, among other topics. This forum was also offered as a hybrid event.

AURI Connects will continue to be a catalyst in developing new opportunities to positively impact the state's ag and food industry for years to come.

"As always, AURI assembled and hosted an informative Minnesota Renewable Energy Roundtable on December 1st, focusing on biogas opportunities for Minnesota. It was an honor to participate and I am looking forward to working with AURI on other events in the future."

Todd Taylor, Impact Counsel,
Avisen Legal



FINANCIAL STATEMENT

Fiscal Year 2023

Revenue

State Appropriations	\$4,580,731
Collaboration & Partnership Grants	\$773,712
Federal Grants	\$528,556
Fee-For-Service	\$285,984
Interest - Investments	\$150,709
Royalties	\$94,507
Sponsorships	\$41,008
Miscellaneous	\$17,826
Project Fees	\$15,379
Donations	\$9,727
Registrations	\$6,042
Total	\$6,504,181

Expenses*

Programs & Services	\$3,660,955
Program Support	\$1,019,215
Operations	\$886,187
Institutional Advancement	\$675,241
Total	\$6,241,598*

Net Income or (Loss) \$262,583

**Does not include \$142,034 in capital equipment purchases during FY23*

Note: Fiscal Year 2023 Financial Statement was unaudited at time of report

STATEMENT OF ACTIVITIES

AURI had a net gain of \$262,583 at fiscal year-end 2023. AURI used a substantial amount of the net gain on the year to make investments in capital equipment of \$142,034, which is not reflected as an expense on the income statement. AURI exceeded its target revenue goal for the year and was within 5% of its forecasted expenses. Due to these circumstances and after accounting for capital investments, AURI ended the year with a slight net gain with cash amounts exceeding expenses by less than 2%. Overall, AURI generated \$6,504,181 in revenue and expended \$6,241,598.

AURI's short-term financial outlook is positive. Over the past year, the organization has attracted a pipeline of grants and contracts that will generate revenue through subsequent fiscal years. AURI continues to have a robust project portfolio with several noteworthy accomplishments in FY23, including federal grant award commitments of \$200,00 from the USDA Rural Cooperative Development program and \$500,000 from the USDA Ag Innovation Center program. Other positive developments include cooperative agreement extensions with the USDA Ag Marketing Service for an additional \$269,500, several other grant commitments, subawards and contracting related to Legislative-Citizen Commission on Minnesota Resources (LCCMR) projects, and support from the Minnesota Soybean Research & Promotion Council, Minnesota Corn Research & Promotion Council and the Minnesota Department of Agriculture. Long term, AURI continues to leverage the funding it receives from the State of Minnesota to add new skills and expertise, implement programs and invest in facilities and equipment to maximize its impact on Minnesota agriculture. AURI looks forward to 2024 and continuing its exceptional service to benefit Minnesota's agricultural industry.





LOOKING FORWARD

The future for value-added agriculture looks bright and there are many opportunities for AURI to expand markets and drive positive impact for 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 be looking forward strategically as we prioritize areas of focus, build pipelines of clients and collaborators and continue our foundational effort to build our ecosystem for new and continued market growth of the state's agricultural products.

New Resources

After roughly 30 years in the same location in Waseca, AURI will transition to a new home in January 2024. The AURI Bio-Industrial complex will roughly double our present pilot capabilities, currently split between two different sites. This will allow us to add new equipment that will aid our work areas for the commercial market expansion of ag-derived products, as well as increase efficiency by consolidating resources under one roof. Waseca added capabilities around anaerobic digestion, biomass drying, decortication and oilseed pressing at an annex site a few years ago. Bringing these capabilities, along with our densification and processing operations into one building will create new synergies and enable us to better fill scale-up gaps to further bio-industrial client projects and initiatives.

AURI's Marshall site is also undergoing a major upgrade with new equipment and/or replacement of older equipment. The lab recently added small-scale fermentation processes and biomethane potential analysis to support initiatives and clients. In the year ahead, the analytical lab will offer new mass spectrometry technology to serve a greater number of projects and project scopes. AURI is increasingly approached to perform work beyond our means and this new equipment will greatly enhance our capabilities while providing Minnesota entrepreneurs and businesses with the data they need to make informed decisions in developing new products and process improvements. The new demand spans both bio-industrial and food clients as they require more in-depth detail about their products due to consumers seeking greater transparency. Additionally, an elemental analyzer will assist work in nutrient recovery (nitrogen, phosphorous, potassium) and biobased fertilizers as AURI adds resources to these industry interest areas.

The Minnesota legislative investment in AURI during the 2022 and 2023 sessions for new equipment and upgrades to laboratory sites has been a major catalyst in improving AURI's capabilities and in providing better service to Minnesota's innovative agriculture sector.

Partnerships/Collaborations

AURI fills a unique role in collaborating across the value chain to accelerate opportunities. One of the areas 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 new 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 the entrepreneurship and innovation areas. MBOLD focuses on feeding the world in a more sustainable



manner across four work areas: entrepreneurship, innovation, soil health and flexible film recycling. Through MBOLD, AURI partners with Compeer Financial and Naturally MN, and receives financial support from Launch MN, to execute the Bold Growth entrepreneurship program to scale high growth ag/food businesses. Serving nine companies to date, the program will continue working with a small cohort of entrepreneurs to grow their food and ag businesses. Additionally, AURI is working with Target, McKinsey & Company and MBOLD members to frame an initiative around protein sustainability to build upon Minnesota's rich protein assets.

The United States Department of Agriculture (USDA) has become a prominent partner in pursuing innovation opportunities through its Agricultural Marketing Service, which offers local and regional meat processing assistance programs and has designated AURI as one of seven technical assistance providers 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 six Agricultural Innovation Centers across the country to work with producers in developing value-added opportunities for their crop and livestock production. AURI hopes to continue this collaboration well beyond the initial program's end date of December 2024. Also, AURI has found repeated success via the USDA Rural Cooperative Development Program that allows 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 that today consists of over 250 entities. The investment from the State of Minnesota and the federal government to build its first fermentation scale-up site in Minnesota is very exciting and will put 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 our agricultural byproducts to contribute to the circular economy – thereby creating new rural industries while also reducing environmental footprints. Greener fertilizer is an exciting area for Minnesota since we don't produce synthetic fertilizer in the state, so any new industry advancement in this area can create and retain wealth across our rural communities. The University of Minnesota has been at the forefront of green ammonia and potential applications, and AURI has been using those foundational efforts to analyze the potential for a viable green fertilizer industry using green ammonia and carbon dioxide produced during biofuels processing. Additionally, we intend to explore the recovery of essential nutrients from agricultural byproduct streams to be utilized in feed inputs and fertilizer applications to add new value.

Exploring how AURI can advance sustainable aviation fuel (SAF) or renewable diesel is also an intriguing space. While the technologies are well known, there are still unknowns and AURI seeks to fill gaps to help ensure success for those venturing down these paths. Hydrogen is a key ingredient in these processes and identifying multiple markets for hydrogen – from green fertilizers to SAF to fuel cells – will help set future demand to derisk investment that can support our diverse agricultural production and ag derived products.

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

STATE FISCAL YEAR 2023

Active Projects and Progress Report

Food	
Kernza Process Discovery	88%
Soy Nutrition Institute 2023	12%
FY23 MN Beef Council Phase II Sustainable Packaging	100%
Kernza Cleaning	63%
Food Business Toolbox	41%
Co-Manufacturing Toolbox	46%
ND Livestock Study	100%
Elderberry Specialty Crop Block Grant Program	21%
Artisan Grain Collaborative	100%
Food Product Assistance	48%
Matzo Ball Soup Scale-Up	45%
Sambusa for School Lunch	79%
Herbal Tea Technical Assistance	25%
Pistachio Spread Technical Assistance	100%
Ice Cream Startup Technical Assistance	16%
Tea Technical Assistance	47%
Candy Technical Assistance	0%
Goat and Broiler Market Assessment	100%
Aronia Berry Puree Development	44%
Salsa Technical Assistance	14%
Chickpea Products Technical Assistance	88%
Green Sauce Scale-Up	45%
No Grain Granola Development	98%
Chocolate Bar Nutrition	75%
Dried Apples Technical Assistance	100%
Cookie Dough Technical Assistance	100%
Hot Sauce Technical Assistance	100%
Designer Brownie Nutrition	38%
Waygu Beef Technical Assistance Further Processed Product Development	3%
White Wine Biscuit Technical Assistance	100%
Sunflower Seed Nutrition and Testing	0%
Wild Rice Assessment	77%
Artisan Cheese Nutrition Labels	100%
Soup and Entrée Technical Assistance	69%
Drink Mix Formulation	5%
Barley Flour Processing	38%
Tibetan Hot Sauce Technical Assistance	100%
Organic Spice Blend Nutrition	100%
Pizza and Pasta Sauce Technical Assistance	100%
Drink Mix Technical Assistance	100%
BBQ Sauce Assistance	100%
Food Cooperative	7%
Asian Sauce Technical Assistance	100%
NA Beer Technical Assistance	100%
Sauces Technical Assistance	100%
Frozen Curry Sauce	31%
Granola Bar Nutrition Labels	80%
RTD Cocktails Nutrition	100%
Granola Labels	100%
Ice Pops Scale-Up	93%
Flatbread Labels and Scaling	100%
Meat Labels - HACCP	100%
Fish Jerky Labels	100%
Cookie Dough Labels	100%
Curry Nutrition Labels	100%
Hazelnut Processing Assistance	100%
Commercial Kitchen Feasibility	100%
Beef Locker Development	100%

Sauce Nutrition Labels	100%
Granola Nutrition	100%
Chinese Dumpling Labeling	41%
Chai Tea Scale-Up	100%
Smoked Pepper Sauce	30%
Tiger Nut Beverage Nutrition	100%
Herbal Tea Scale-Up	100%
Flour Milling and Marketing	100%
Jamaican Jerk Sauce Labels	63%
Mediterranean Meal Nutrition	100%
Pie Nutrition Updates	100%
Leafy Greens Nutritional Panels	100%
Toffee Nutrition Facts	80%
Ground Beef Feasibility Study	100%
Dairy Nutrition Labels	100%
Gyro Labels	100%
Facility CAD Drawings	100%
Frozen Empanada Assistance 2	100%
Lactose Free Ice Cream	100%
Soy Food Plant Expansion	100%
Elderberry Company Development	100%
Juice and Hot Sauce Food Safety	63%
Nutrient Forward Baking Mix	90%
Pumpkin Seed Roasting	100%
Snack Label Development	100%
Fruit and Fiber Smoothie	100%
Kombucha Development	100%
Craft BBQ Sauce Scale-Up	100%
Hemp Oil / Cake Pressing and Evaluation	100%
Ice Cream Label Update	100%
Gluten Free Cream Pie	100%
Sambusa Nutrition	100%
Non Alcoholic Mixers	100%
Elderberry Assessment	100%
Meat Copacking Labels	69%
Seasoning Rub Nutrition	100%
Chickpea Products Tech Help	100%
Wild Rice Processing	74%
Simple Syrup Tech Assistance	50%
Vegan Pizza Labels	100%
Milk Jam Formulation	100%
Pickle Formula Assistance	100%
Product Formulation Assistance	100%
Pizza Label Development	5%
Plant Based Labels	100%
Scaling Hot Sauces	100%
Eritrean Beer Formulation #2	78%
BBQ Sauce Labels	100%
Ethiopian Savory Pies	100%
Teff Recipe Formulation	87%
Shrimp Production Gallery	100%
Kombucha Shelf Life	100%
Chocolate Labels	100%
Heritage Grains Sourdough	100%
Commercial Kitchen Business Model Assessment	100%
Cultivated Wild Rice PDCAAS - AIP	100%
Bio-Industrial	
Corn - Soybean Logistic Study	100%
Colloidal Barrier Pile Cover	100%
AURI BioMulch Research Project	100%
Biobased Concrete Demonstration	100%
Soy Product Dust Control	100%
Supplement Development	28%
Soy Dust Suppressant	56%
BioMulch Commercialization with TechAccel	100%

Feed Assistance	100%
Film Distillation	100%
Hempcrete Home Project	100%
Pulp Biobased Products	100%
Farm Hemp Analysis	100%
Starch Testing	52%
Analytical Feed Grant	100%
Minnesota Renewable Energy Roundtable (MNRER)	100%
Ethanol Fuel Cells	63%
Green Amonia Fertilizer	100%
Bark to Energy Implementation	100%
Growing Soybean Meal Demand - Livestock Economic IMPLAN Analysis	93%
Soybean Meal Fertilizer Market Analysis and Commercialization Enhancement Potential	75%
Composting Assistance	100%
Alfalfa Utilization	100%
FGDDGS Tech Assessment	100%
Grain-based Litter Claims Validation	44%
Mushroom Growth Media Pasteurization	89%
Soil Compost Development	10%
Pelleting Efficiency Trials	100%
Ag Lime Pellet Blend	2%
Organic Fertilizer Development	67%
New Feed Development	100%
Composting Process Development	39%
Dairy Compost Project	13%
Oat Hull Project	0%
Residue Assessment	45%
Soybean Meal Demand Study	100%
Hog Manure Pellet	54%
Characterized Coffee Grounds	100%
Natural Fertilizer Development	100%
Feed Process Assistance	100%
Tree and Shrub Fertilizer Development	100%
Alfalfa Fertilizer	100%
Groated Oat Plant Expansion	100%
Biobased Noxious Weed Control	100%
Hemp Fiber Applications	100%
Spent Lime Pellets	100%
Industrial Hemp Biomass Testing	100%
Pet Treat Development	100%
Waste Soybean Processing	100%
Bio Char Sizing	100%
Blended Feed from By-Products	100%
Grit Weeding Assessment	31%
Pennycress Development	100%
Anaerobic Digester Initiative	100%
Digester Feasibility Assessment	33%
Anaerobic Digester Support	100%
Portable Anaerobic Digestion	100%
Green Ammonia for Rural Power	10%
Renewable Ammonia Hydrogen	100%
Multi-Area	
Kernza Supply Chain LCCMR	42%
Forever Green FFAR Grant Implementation	79%
Hemp Processing	5%
Hop Concentrate	100%
AURI Connects: Fields of Innovation	73%
USDA-RD Ag Innovation Center (AIC)	26%
New Uses Forum - Bold Open 2023	100%
ATP BIO Collaboration	29%
Industry Thought Leaders	100%
Webinar Wednesday	100%
Technical Advisory Program	95%
Perennial Flax LCCMR	4%
Hemp Commercialization	20%

Bold Growth 2022	84%
Fields of Innovation	100%
Soy Nutrition Institute 2022	100%
Technical Advisory Program	100%
Bold Growth 2021	100%
Pennycress Assessment	36%
Camelina Initiative	91%
FY23 MDA Tech Assistance	18%
Life Cycle Analysis	100%
MBOLD Protein Scoping	100%
DDG Food Use	100%
Meat Processing Technical Assistance	52%
Tech Support PPIC	54%
Mobile Meat Slaughter Grant	100%
Empowering Local and Regional Protein Processing in the Upper Midwest	51%
Stearns County SWCD Kernza	100%
Barley Malt Plant	0%
Smoker Fuel Pellet Development	86%
Expansion Digestibility Validation	100%
Sunflower Meal Utilization	100%
Shrimp Product Analysis	79%
Innovation Needs Assessment	100%
Whey Fermentation Implementation	100%
Food Grade DDGS	100%
Baby Carrot Line Expansion	100%
UpCycled Spent Brewers Grains	100%
Meat Processing	100%
Coop Business Plan Development	100%
Grape Pomace Utilization	100%
Pet Treat Pilot Test	100%
Gummy Product Analysis	62%
Community Navigator Implementation (MBFFA-Bus. Focused on Food and Ag)	29%

CROOKSTON

510 County Road 71, Suite 120
Crookston, MN 56716

MARSHALL

1501 State Street
Marshall, MN 56258

ST. PAUL

University of Minnesota
1354 Eckles Avenue
St. Paul, MN 55108

WASECA

12298 350th Avenue
Waseca, MN 56093

218.281.7600

AURI.ORG