



ANNUAL REPORT
Fiscal Year
2016



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From the Executive Director



On behalf of the Agricultural Utilization Research Institute, it is my sincere pleasure to report on the organization's activities and impacts from the past year's operations. AURI saw a number of successes, identified solutions to new challenges, supported Minnesota's food and agriculture sector and above all, practiced its new mission with passion and enthusiasm.

I had the privilege of traveling throughout Minnesota in my first year at AURI to meet with several stakeholders and clients about value-added agricultural projects and opportunities. In looking back over the year, the scope of the product ideas and inventive companies across Minnesota is amazing and it is an honor to lead an organization that collaborates with so many innovative individuals, businesses, and partner organizations across the state to commercialize opportunities.

The past year saw AURI work on more than 200 projects, with 114 of them newly initiated during the fiscal year. A significant driver of this activity was steady-to-increasing demand for the organization's services in the areas of food and coproducts. Numbers don't tell the full story however, as it is both the volume and complexity of demand in these service areas that outstripped AURI's current resources, leading to the creation of a client waitlist. This is an indicator of the growing need for AURI's assistance and capabilities as well as recognition of past commercialization services success.

Also, a number of AURI's past clients, representing roughly 50 percent of major projects, provided impact estimates from AURI services. These businesses attributed an additional \$76.9 million in *annual* gross sales of food and agricultural products to AURI as well as the creation and retention of more than 600 jobs across the state.

In the report that follows, you will learn more about the services offered by AURI, the focus areas in which we operate, examples of client and initiative projects, as well as our financial results for the past year. Together, they provide a useful vignette of the organization's activities in 2015/2016 and its dedicated effort to bring innovative ideas to commercial reality.

Regards,

A handwritten signature in black ink, appearing to read 'Shannon M. Schlecht'. The signature is fluid and cursive, with a long horizontal stroke at the end.

Shannon M. Schlecht

From the Board Chair

On behalf of AURI's Board of Directors, I want to thank all of the organization's partners and stakeholders for supporting us through another year, especially the legislature for their strong support of AURI services.

In reviewing the results from this year's report, I am pleased with the achievements AURI made in a number of areas. First, the organization continues to provide resources and services to Minnesota farmers, entrepreneurs and businesses that are truly unique throughout the Midwest. Second, I am proud to say AURI's work in the areas of food, coproducts, biobased products and renewable energy has been nothing less than innovative. Last, but not least, through our Innovation Network Program, AURI brought together some of the brightest minds on the value-added ag industry to brainstorm new possibilities to benefit Minnesota's agricultural industry and economy.

These are all very positive results and due, in no small part, to you and your support of AURI.

Thank you.

Ron Obermoller
AURI Board Chair

2016

Board of Directors

Ron Obermoller, Chair

Minnesota Soybean Research
& Promotion Council

John Gilbertson, Vice Chair

Minnesota Farm Bureau Federation

John Goihl, Secretary/Treasurer

Agri-Nutrition Services - Agribusiness

Art Brandli

Minnesota Wheat Research
& Promotion Council

Jerry Hasnedl

Minnesota Farmers Union

Rep. Deb Kiel

Minnesota House of Representatives

John Schafer

Minnesota Beef Council

Sen. Matt Schmit

Minnesota Senate

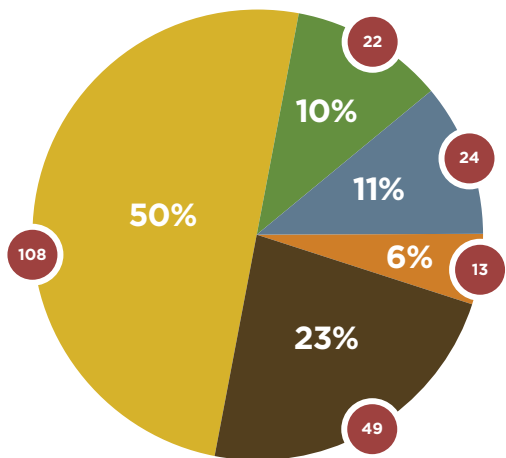
Jill Zullo

Cargill - Agribusiness

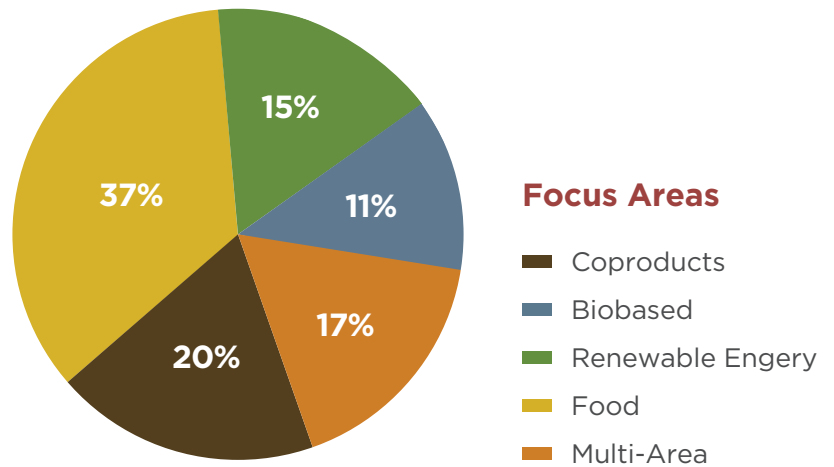
At a Glance



Total Projects Serviced



Project Hours by Focus Area



State fiscal year 2016 total revenue

\$4,422,606

State fiscal year 2016 expenses

\$4,265,621

Data provided from AURI's Microsoft Dynamics Accounting System. All data based on State FY16 (July 1, 2015 to June 30, 2016)

Client Impact: July 2010 through June 2016

Estimated number of jobs created/retained



Estimated number of future jobs created/retained



(in next 5 years)

Estimated new capital invested to date



Potential future capital investment in next 5 years



(Above and beyond new capital invested to date)

New gross annual sales resulting from AURI assistance

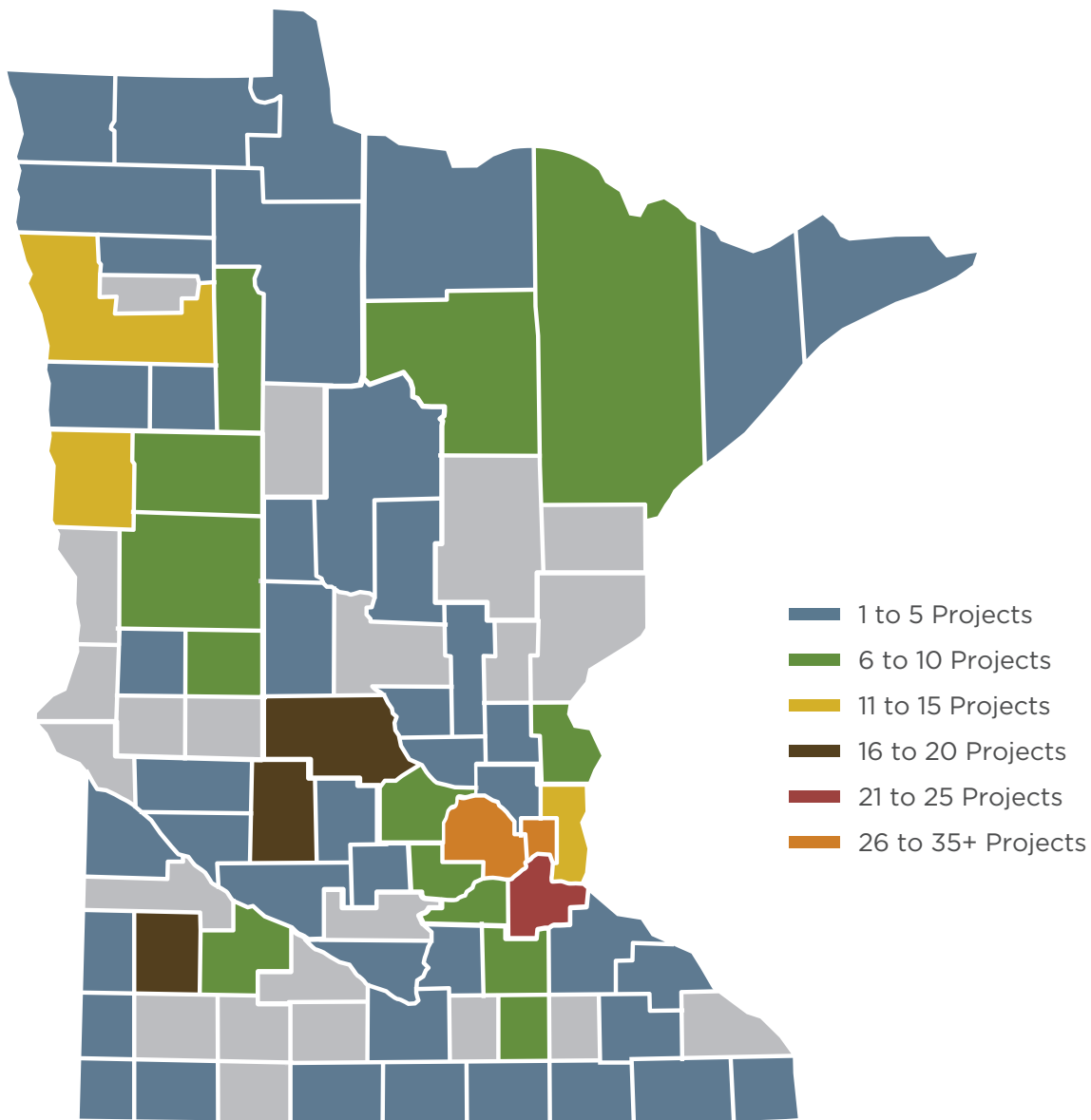


Tons of additional commodity utilized per year



Data obtained via client survey representing 50 percent of projects that exceeded five hours.

AURI Client Projects Worked On 2010-2016



AURI is proud to partner with businesses and entrepreneurs throughout Minnesota. As the map above shows, AURI worked on client projects in most of Minnesota's 87 counties between July 1, 2010 and June 30, 2016. The impact of these collaborations, as noted on page 5, were significant to communities throughout the state.

AURI Mission

Foster long-term economic benefit for Minnesota through value-added agricultural products.



FOOD



COPRODUCTS



**BIOBASED
PRODUCTS**



**RENEWABLE
ENERGY**

In pursuit of its mission, AURI developed four distinct areas of endeavor, which include Food, Coproducts, Biobased Products and Renewable Energy. While each of these areas may seem unique and diverse from one another, they do share a commonality. Within each, AURI's staff works diligently throughout the year to identify beneficial new uses for commodities, develop new and disruptive processes and create meaningful economic opportunities to support the state's farmers, processors, small businesses and entrepreneurs.

Services

AURI offers a number of services to clients utilizing Minnesota grown commodities. They include hands-on technical assistance as well as access to laboratory space, both of which would normally be prohibitively expensive to small business owners and entrepreneurs. In addition, AURI offers commercialization services to help clients successfully bring their products to market. This can include economic assessments or feasibility studies, and providing counsel on formulas for ingredient mixes when scaling up products to higher volume production levels.

Food

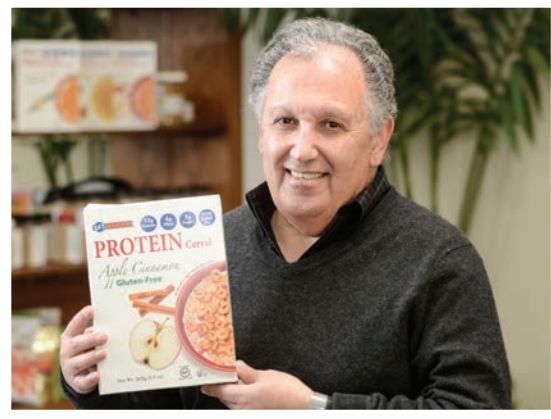
It is most accurate to call 2016 an exceptional year for the food focus area. AURI continued to experience a high level of project requests from food clients.

Minnesota's agriculture is diverse, providing a wide variety of food ingredients to meet changing market demand. This includes the recent trends of gluten free and high protein foods, food products using alternative protein sources, organic and of course, substitute ingredients to meet clean label demands. AURI has been assisting clients with these trends throughout the past year.

Over the course of 2016, AURI's food team worked on a variety of projects that contribute to Minnesota's agricultural sector. In fact, the team worked on 106 food projects, which accounted for half of the organization's total projects and nearly 37 percent of total project hours.

In that time, AURI's food scientists and project leads worked to bring innovations to consumers throughout Minnesota and beyond. Some of the biggest accomplishments include helping small businesses move from farmers' markets to grocery store shelves and assisting clients with new dairy product formulations for cleaner labels. Additionally, AURI assists clients with nutritional labels and shelf life stability.

What's more, AURI devoted itself to strengthening Minnesota's food industry by bringing thought leaders together in a variety of innovative roundtables and networking opportunities. These events gave thought leaders an opportunity to meet with colleagues, share perspectives on industry trends and move Minnesota food innovation forward.



AURI devoted itself to strengthening Minnesota's food industry by bringing thought leaders together.

AURI's simultaneous support of product development and production industries for innovative food products, as well as health and wellbeing industries is without parallel. As the organization moves into 2017 the goal is to continue this tradition of excellence.

Additionally, industry analysis indicates the demand for services in this area will only increase in the coming years and the food team stands ready to capitalize on new opportunities.



Food Projects



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AURI provided experience for start-up ventures in the agricultural industry, which simply put, are not available anywhere else.

-AURI Food Client
Testimonial

”

AURI & Kay's Naturals

Idea to reality:

Create healthy snack foods that meet the nutrition needs of diabetics, those trying to lose weight and a general population that needs healthier food.

AURI's role:

AURI scientists provided the business with product development and nutritional analysis as well as labeling assistance.

Outcomes:

Today, Kay's Naturals annual sales are in the seven-figure range, their products are in more than 9,200 stores, and they employ 6-7 people in Clara City, Minnesota.

Coproducts

AURI's coproducts team spent last year identifying new uses for Minnesota commodities and agricultural residue, with the goal of creating significant new revenue streams for Minnesota's agricultural producers and processors. The team achieved this goal time and again, developing new products and new uses through technology and innovation that benefit individuals and businesses across the agricultural value chain.

The coproducts focus area accounted for 23 percent of total projects serviced and nearly 20 percent of total project-hours with the team working on 49 unique projects. Their work ran the gamut from assisting in the creation of improved smoker pellets for beekeepers to partnering in the development of a fishmeal replacement for Minnesota's burgeoning aquaculture industry.

While these may seem like significantly different projects, they share a number of qualities. First and foremost they both utilize Minnesota-grown commodities, and both of these advances help enhance economic activity across the agricultural sector value chain. Last, but certainly not least, in both cases AURI helped develop a new use for commodities, which means utilization and new revenue streams for growers and processors. Innovations like these lay at the core of AURI's mission and serve as compass points for the organization as it moves into the next year.

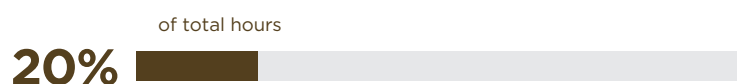
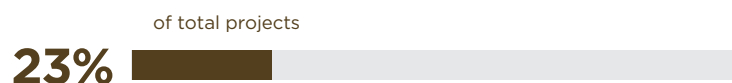


AURI's coproducts team spent last year identifying and creating new uses for Minnesota commodities.

Looking to 2017, AURI intends to enhance its capabilities by expanding resources in its coproducts pilot lab. The goal is to add new dryer and cold press technology to offer clients the research and testing facilities they demand. With these additions, the expectation is the coproducts team will be able to assist a higher number of entrepreneurs and businesses in a given year, helping turn more ideas into reality.



Coproduct Projects



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AURI's assistance allowed us to complete R&D research trials. This was critical to entering the marketplace.

-AURI Coproducts
Client Testimonial

”

AURI & JavaCycle

Idea to reality:

JavaCycle, a Faribault, Minnesota, company, was looking for a value-added use for Minnesota agricultural coproducts, in combination with coffee chaff, a byproduct of coffee roasting.

AURI's role:

AURI helped develop an all-purpose fertilizer product produced mainly from Minnesota agricultural coproducts and coffee chaff.

Outcomes:

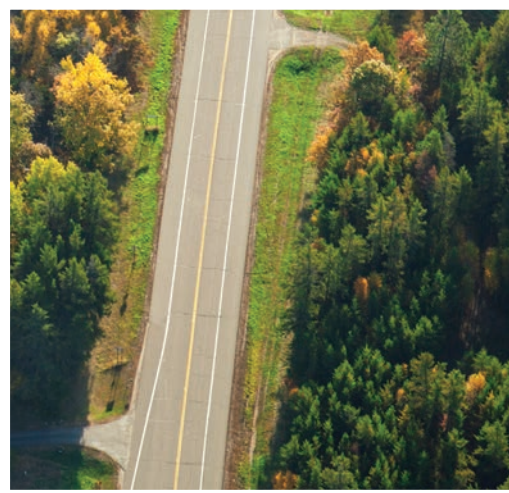
The Midwest Organic Services Association approved the fertilizer product and it is currently available at retailers and will be available on Amazon.com in 2017.

Biobased Products

AURI's efforts in the area of biobased products saw many innovative opportunities in 2016. The team working in this focus area is dedicated to helping Minnesota businesses use biobased products to replace petroleum-based ingredients in materials such as plastics, films, building materials, lubricants, sealants and more. This is important to the state because quite often the discovery, development and deployment of biobased products can lead to the growth of new industries to fulfill demand from a more environmentally conscious market.

Throughout the year, AURI's dedicated team of biobased experts worked on 24 separate projects. This accounted for 11 percent of total projects and hours. During that period, the focus area team's endeavors included a variety of innovative and environmentally significant projects.

A few highlights from the past year include AURI's continued work to help EarthClean find new potential uses for its cornstarch based fire suppressant, which is more environmentally friendly than traditional products. This St. Paul manufactured product achieved a major milestone in 2016 when it was added to the U.S. Forest Service's Qualified Products List for use on federal lands.



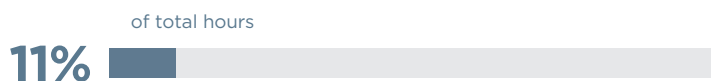
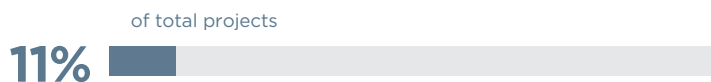
In addition, the AURI team spent much of last year working on a biobased road sealant initiative. The sealants, which typically use soybean oil as its primary ingredient, as well as other ag products grown in Minnesota, has the potential to benefit municipalities throughout Minnesota and the Midwest by extending the life of their roadways with a major Minnesota-grown commodity.

The AURI team spent much of last year working on a biobased road sealant project.

Looking forward, the market for biobased products is seeing a growth trend, which AURI anticipates will mean an increase in both client projects as well as initiatives for the public good. This is excellent news for Minnesota and the region because it means reducing our reliance on petroleum and increasing the demand for the state's commodities.



24 Biobased Projects



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Without the assistance from AURI the product would not have been developed.

-AURI Biobased Client Testimonial

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AURI & EarthClean

Idea to reality:

EarthClean needed assistance with a biodegradable cornstarch-based water enhancer for fighting fires.

AURI's role:

AURI scientists worked with EarthClean on product development and testing.

Outcomes:

In 2016, EarthClean announced that its TetraKO XL-P products was added by the U.S. Forest Service to its Qualified Products List (QPL).

*AURI partnered with Minnesota Corn and Minnesota Soybean

Renewable Energy

The production of renewable energy from agricultural products remains an exciting opportunity. From transportation fuels to heat to electricity, AURI is working on ways to keep agriculture-based bioenergy a strong contributor to the Midwest's economy and our nation's energy future. To that end, AURI's renewable energy team spent 2016 working on projects for the benefit of Minnesota's environment and economy. In that time, the team worked on 22 renewable energy projects that accounted for 11 percent of the organization's total projects and 15 percent of project-hours.

The projects undertaken were as varied as the imaginations of Minnesota's entrepreneurs. One example is the renewable energy team's work on new fuel pellets comprised of agricultural and woody biomass. Another example is the team's work to lead a biomass cooling technology feasibility study, conducted in partnership with the University of Minnesota's Center for Urban and Regional Affairs (CURA) and the Northwest Regional Sustainable Development Partnerships (NW RSDP) programs, and released by AURI to the public. The results of this study could lead to additional uses for agricultural biomass or residues, a decrease in carbon emissions, greater utilization of biomass heating systems and to cooling small to medium structures.

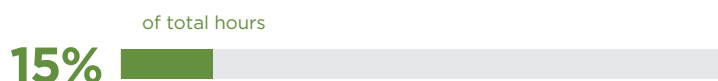
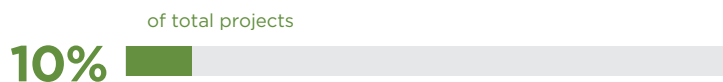


AURI is working on ways to keep agriculture based bioenergy a strong contributor to the Midwest's economy.

Looking to the future, AURI will continue to be both an advocate and trusted resource for renewable energy innovation, with a goal of making Minnesota a leader in bioenergy research and technology. In this way, the organization can ensure a bright future, not just for industry and entrepreneurs, but also for the future generations of Minnesotans who will enjoy the benefits of clean technologies. It's a lofty goal and AURI's unique mix of expertise and services can help meet it.



Renewable Projects



“

We would not be where we are at without AURI's assistance. Almost 100% of our business has been because of their articles in their newsletters.

-AURI Renewable Energy Client Testimonial

”

AURI & Biomass Cooling

Idea to reality:

While biomass is widely-known for heating it is also a viable option for cooling.

AURI's role:

AURI and several other Minnesota and Midwest organizations conducted a study, Biomass for Cooling System Technologies: A Feasibility Guide, to see if biomass could be used as a cooling alternative for small-to-medium sized commercial, industrial and residential structures.

Outcomes:

The guide shows that biomass cooling technology has multiple advantages; biomass cooling can be both an economical alternative to traditional cooling systems as well as an environmentally sound option. The study will help open the door for continued development and implementation of biomass cooling technology for commercial, industrial and residential use.

Innovation Networks

For AURI's Innovation Network Program, 2016 was a year of growth. The program's purpose is to actively engage thought leaders representing business and industry, commodity groups, stakeholders, and educational institutions to raise awareness of technologies and trends.

The program seeks to provide businesses and entrepreneurs with new industry opportunities through ongoing, purposeful connection of resources and partners along the value chain. The primary vehicles for delivery of the program include industry thought leader groups, educational industry forums, and innovation network events. The approach that underscores each of these vehicles is bringing people together for thoughtful and deliberate conversations that ultimately drive economic activity for value-added agriculture in Minnesota. Outcomes sought include making and sustaining network connections, sharing knowledge and information, and ensuring resource awareness to ultimately spur action.



In 2016, AURI's Innovation Network Program convened 29 events, including four industry thought leaders meetings, four industry forums, and 21 network meetings with 356 total participants.

Highlighted activities from the year include:

- Food Industry Thought Leader meetings around Market Differentiation and Soy/Alternative Proteins, and convening the southeast Minnesota Food Industry Thought Leader group regarding Enhancing the Food Agbioscience Sector in the region.
- Forums regarding Opportunities for Soy Based Sealants and Dust Control, Utilization of Pennycress and Camelina as Relay and Cover Crops, and Emerging Opportunities for Fish and Shrimp Production in Minnesota.
- Network events included the Minnesota Renewable Energy Roundtable focusing on anaerobic digestion, Heating the Midwest with Biomass Policy and Benefits and Biomass Combustion Action Teams, and quarterly meetings of the Peer to Peer Food Safety Network.



Minnesota's Renewable Energy Roundtable

Action Initiative

State Fiscal Year 2016 Financials

State Fiscal Year 2016 Expenses

Operations	\$ 557,738
Institutional Advancement	\$ 474,539
Program Support	\$ 875,150
Programs & Services	\$ 2,063,837
Capital Improvements & Expenditure	\$ 294,357
Total	\$ 4,265,621

State Fiscal Year 2016 Revenue Sources

Interest Income	\$ 55,868
Miscellaneous	\$ 284,089
State Appropriations	\$ 3,643,000
Private Grants/Outside Sources	\$ 132,164
Federal Grants	\$ -
Collaborations	\$ 307,485
Total	\$ 4,422,606

The period from which the results and numbers of this report were captured are based on the Minnesota State Fiscal Year 2016 (July 1, 2015-June 30, 2016). Data provided from AURI's Microsoft Dynamics Accounting System.

AURI Facilities

Marshall

Analytical chemistry laboratory

- Chromatography
- Spectroscopy
- Wet chemical analysis
- Physical characterization

Bioproducts laboratory

- Chemical processing
- Extraction and characterization of oils and high-value components
- Small-scale fermentation and digestion processes

Meat laboratory

- Product formulation
- Smoking/cooking process development
- Packaging
- Scale-up
- Process development and scale-up assistance
- Packaging and shelf life guidance

Food Laboratory

- Food formulation and product development guidance
- Nutritional facts labeling and nutritional assessment
- Technical and regulatory assistance
- Sourcing ingredients and packaging
- Analytical food product testing
- Guidance on shelf-life
- Thermal process and food safety review
- Product stability and scale-up
- Troubleshooting

Crookston

Microbiology laboratory

- Microbiological analysis
- Gas analysis

Waseca

Coproducts utilization laboratory

- Grinding
- Milling
- Pelleting
- Blending
- Drying
- Product characterization
- Particle size analysis

St. Paul

- Offices
- Conference rooms
- Food technical client consultations

AURI Locations

Crookston

(Headquarters)

510 County Road 71, Suite 120

Crookston, MN 56716

800.279.5010

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