



Ag Innovation News

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The newspaper of the Agricultural Utilization Research Institute



Looking Back at 25 years of AIN

TELLING THE TALES OF INNOVATION

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BY SHANNON SCHLECHT
AURI EXECUTIVE DIRECTOR

Positively Contributing to Minnesota Businesses and the Economy

For an organization like AURI, the success of its clients is paramount because it indicates whether the organization is achieving its mission and serving its intended purpose. Since the Minnesota legislature created AURI to support the state's agriculture industry by developing new uses for crops, commodities and residue, the best way to determine success is to track the impact AURI has on its clients.

To that end, AURI recently reached out to clients served since July 2010 to determine the impact the organization has on Minnesota's entrepreneurs, businesses and economy. The results, representing roughly 50 percent of past projects, offer a strong indication of the level of AURI's success in achieving its mission.

In reviewing the results, it's a pleasure to report AURI has made a significant positive impact on the state of Minnesota. Here are some highlights I feel are important to know.

First, between July 2010 and June 2016, clients reported they created or retained 603 jobs. This is an important statistic for AURI because Minnesota has always prided itself on having low unemployment rates, and this shows our meaningful contribution to it.

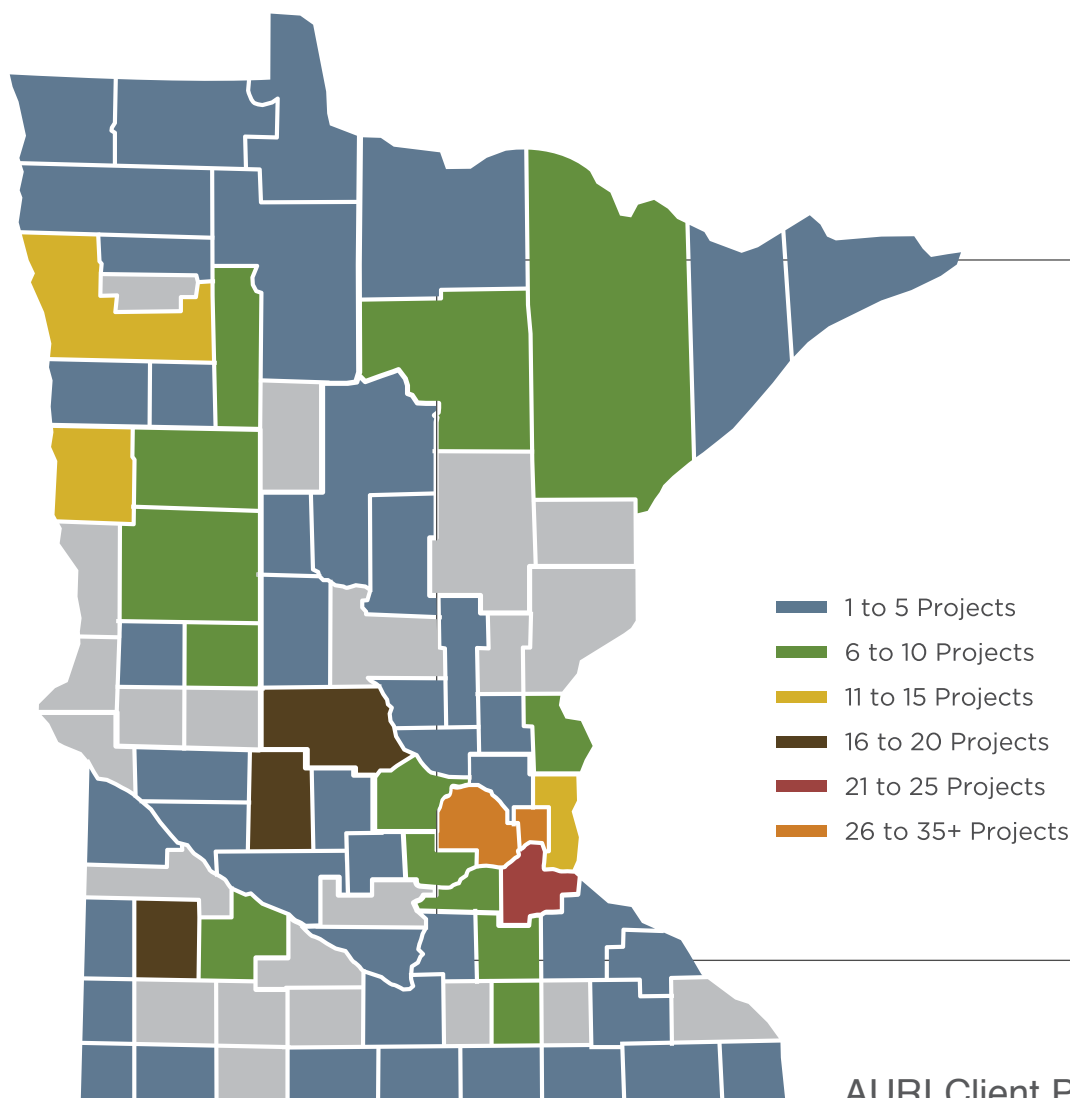
Next, our clients estimated \$76,893,600 in total new gross annual sales resulting from AURI's assistance. This is a result that I am especially proud to share. It is a sign that AURI successfully achieved its mission to foster economic benefit for the state and it means that we were instrumental in helping Minnesota businesses flourish.

In addition, AURI's clients indicated that the organization's assistance enabled them to invest nearly \$90,000,000 in new capital during the same time period. This is significant, because it means that AURI contributed to the industry's economic investment, which in turn creates stronger businesses and positively affects the state's economy.

What's even more impressive is current and past clients reported they expect to devote another \$139,000,000 to capital investments over the next 5 years. That's a 54 percent increase in capital over their previous investments. This tells me that many of our clients are feeling optimistic about the future of their companies and their ability to provide new, innovative solutions to the marketplace.

Finally, AURI learned that thanks to the hard work of its staff, clients utilized an additional 323,858 tons of Minnesota commodities annually. This means that during the period of study, AURI's clients increased demand by nearly 2,000,000 tons for Minnesota commodities that might have otherwise added to the supply situation, likely resulting in lower commodity prices. Utilization is in our name and creating additional disappearance is good for the state's agricultural industry and economy.

I am very proud of these achievements because they stand as a testament to the importance of AURI's role of creating new opportunities for the state's agricultural products and to meeting its mission of providing economic benefit throughout Minnesota.



“Our clients estimated \$76,893,600 in total new gross annual sales resulting from AURI's assistance.”

AURI Client Projects Worked on 2010-2016

Board Spotlight

Q&A with new board member, Larry Johnson.



BY AURI

This quarter, *Ag Innovation News* is highlighting one of the newest individuals elected to AURI's board of directors, Larry Johnson. He joins the organization after spending many years in various agriculture and value-added roles and AURI heartily welcomes him to the board. Read on to learn more about Director Johnson.

PHOTO BY BBI INTERNATIONAL

AIN

Which agribusiness do you represent?

I represent agribusiness through my consulting business, LLJ Consulting and Business Development, which focuses on the ethanol industry specifically and the bioprocessing sector in general, primarily using cereal grains (First Generation) and crop residues (Second Generation) as feedstocks.

LJ

AIN

What direction do you see value-added agriculture going over the next 3 years?

Consumers are demanding carbon reduction and products that are environmentally-friendly as well as locally grown. Fortunately, process technology, microbiology and new chemical applications are rapidly advancing, creating new products that I couldn't have dreamed about a few years ago.

LJ

AIN

Please give us some highlights around your agriculture background.

I was a full time cash grain farmer from 1964 to 1988 along with producing hatching eggs from 7,000 turkey laying hens per year. My seven years on the National Corn Growers Association board (1982-1988) provided me with a broader perspective of our nation's agriculture and an awareness of the potential value locked up in our commodities and the need to diversify into alternative markets. After my 25 years in production agriculture, I provided a variety of services to the ethanol industry, from marketing with the Minnesota Dept. of Ag to the development of dozens of ethanol projects around the country as a private consultant and as business development director for Delta T Corporation. The last few years, my focus has been on the tremendous potential of corn stover as a feedstock to replace countless petroleum-based products.

LJ

AIN

What do you hope to accomplish during the next 3 years?

I hope to provide political guidance and support for the organization's efforts as well as contribute to the success of new projects and expand the organizational vision of what is possible.

LJ

AIN

What kinds of projects/initiatives do you feel have the best opportunities in Minnesota today?

I have assisted the BioEconomy Coalition of Minnesota to pass the Biochemical Production Incentive legislation as a means to develop a biochemical industry in Minnesota, similar to how we created an ethanol industry in the state. There is also huge potential in the food and personal products industries, an area in which I am excited to learn more.

LJ

AIN

Have you worked with value-added agriculture in the past?

Yes. As I phased out my farming operation in the late eighties, I had confidence in the future of value-added opportunities in agriculture. Recognizing that my resume and formal education was limited in 1988, I secured the first of 10 annual, part-time contracts with the Minnesota Department of Agriculture to assist in expanding the market for ethanol. We developed many promotions and a seminar series to educate mechanics, dealers, and vo-tech students in both the auto and small engine industries; a program that became known as the "Ethanol Answerman". It soon became obvious that just expanding the market for ethanol was not enough; we needed to develop a processing industry in Minnesota. That early effort led to the building of 21 ethanol plants that today produce about 1.2 billion gallons of ethanol from 430 million bushels of corn every year.

LJ

AIN

What would you like to see AURI accomplish during your term on the board?

Continue with their excellent track record and expand the public recognition of the successes and potential economic benefits of adding value to Minnesota's agricultural products.

LJ

AIN

Do you have a philosophy about the role of the Board of Directors?

I believe directors of all boards must aggressively aspire to bring new ideas and improve the operation and vitality of the organization. Everyone has a viewpoint of some kind, and a quality board can unify and expand those viewpoints into a strategic vision to create great ideas and outcomes.

LJ

AIN

What are your goals in joining the AURI Board of Directors?

I hope to be able to utilize my experiences and business network to contribute to the success of AURI clients and benefit the organization. From a personal perspective, it will enable me to stay more closely involved with agriculture and new product development.

LJ

AIN

Do you have any experience with AURI in the past?

I have utilized the knowledge base of AURI staff as well as some specific client product research on corn stover.

LJ

THOUGHT

LEADERS

STRENGTHEN

MINNESOTA'S

FOOD

INDUSTRY

BY AURI

As new opportunities and consumer preferences continue to drive growth in the food arena, AURI understands the importance of continually taking the pulse of the industry for new insights. It accomplishes this with the help of a Food Industry Thought Leaders (FITL) team, comprised of industry experts who are dedicated to exploring market opportunities and challenges the food industry faces.

Created in 2015, the group and its members have the opportunity to influence what public domain research is prioritized by AURI, identify solutions and opportunities for their business or industry and give access to a diverse cross-section of industry experts and networks. Nan Larson, AURI's director of innovative networks, says, "Information gleaned from interaction is also utilized to assist AURI clients and help Minnesota's Research & Promotion Councils in identifying opportunities to grow and to utilize more of Minnesota's commodities. It is an invaluable tool in bringing in subject expertise to AURI programming."

Food Industry Thought Leaders members include AURI staff, global food manufacturers, researchers, grocery providers, small food companies and entrepreneurs, as well as meat and dairy providers. Also, the group invites special guests that represent whichever industry is the focus of a particular meeting. This enhances the discussion, widens the knowledge base and increases networking opportunities. Throughout the year, the thought leaders are also engaged in various ways, including helping shape and review public domain initiatives.

The FITL team met most recently in February with an agenda focused on examining trends, opportunities and innovations in both alternative and traditional proteins. The meeting was a collaboration with the Canadian Consulate's Protein Highway Initiative, which created international networking opportunities for everyone in attendance.

One of the meeting's guest speakers, Joice Pranata of Lux Research, started the day with her organization's recent research entitled *Shift to Alternative Proteins: Novel Formulations Address Hurdles to Adoption*. The increased demand for protein is opening doors for multiple sources, including alternative proteins, which Lux defines as plants, algae, agricultural and food waste, insects, synthetic biology, and in-vitro meat.

Development of these alternative proteins are due to the convergence of several drivers, including consumer preference, environmental concerns, and, ultimately, protein supply concerns. Experts predict that future protein demands will shift, as consumers welcome more alternative sources of protein.

Lux identifies oat, soybean, pea and lupin beans as some of the most promising plant protein sources. Currently, the growth of meat and seafood consumption pales in comparison to global soy consumption within the same time period. However, a single alternative protein source is not necessarily the solution. Lux's Research Resource Information for System Knowledge (RISK) Platform analyzes the supply chain to identify resource utilization hotspots.





Attendees of AURI's most recent Food Industry Thought Leaders meeting were joined by a variety of knowledgeable guest speakers who discussed the merits and latest innovations of alternative and traditional protein sources.

While the RISK Platform indicates alternative proteins utilize fewer resources, other adoption hurdles exist, including nutritional, commercialization and formulation issues. Examples of formulation challenges include off-flavors, poor functionality, limited stability and anti-nutrients but technological innovations in the alternative protein space have the potential to address these challenges. Processing approaches can modify and enhance the flavor and functionalities of protein and various technologies are developing across the board. Production of protein involves growing, farming or synthesizing the protein sources. Many opportunities exist for players in different industries to address unmet needs in the alternative protein space.

Dr. Austin Lowder, representing DuPont Nutrition and Health, spoke regarding DuPont's protein solutions. His department takes renewable raw materials to create food ingredients that food manufacturers use to create safe, nutritious and healthy products. DuPont focuses on soy proteins, including spray dried powders and textured proteins. They label these ingredients as structured vegetable protein, with one having a key ingredient of soy protein isolate and the other soy flour. DuPont provided samples of their trademarked ingredients incorporated into Vegetable "Beef" Stew and "Beef" Bulgogi. Along with soy, DuPont is also doing some research in the pea protein area. Some of the advantages of pea protein include favorable public perception and no allergen statement required. Opportunities for differentiation and optimization exist in scalability, oil content, understanding of allergenicity and functionality. The Protein Digestibility Corrected Amino Acid Score (PDCAAS) is typically less than 0.80 (compared to soy protein at approximately 1.0), however more research is needed around processing and application.

Christina Connelly with the Canadian Consulate's Protein Highway Initiative, presented on *Enabling Innovative Agricultural Technology Solutions from Plant Proteins in the U.S. and Canada*. The Protein Highway is a network for plant-based protein innovation. The vision is that by 2025, the Protein Highway region of the U.S.-Great Plains and Canadian Prairies will lead the world in the production and processing of highly-nutritious plant proteins for humans and animals, thereby promoting regional economic success and a healthier North American and global population. The pre-competitive initiative will unite the industries, universities, and governments in Canada and the United States to create the world's foremost value chain for healthy food protein production from plants. Bilateral cooperation will drive economic success through increased regional innovation and investment in plant protein developments and products. Regional plant protein production and processing will demonstrate the highest level of sustainability and lowest level of greenhouse gas emissions per pound of consumable plant protein produced globally.

Lee Anne Murphy of the Manitoba Agri-Health Research Network (MAHRN) said their mission is to support research, development and commercialization of Manitoba-grown-and-processed plant and animal bioactives as functional foods, food ingredients and natural health products. The MAHRN does this through project coordination, partnership development, integrated communications, global outreach and commercial test market services. They have a field-fork-function process that is followed by building on their rich and diverse base of agricultural raw materials, leveraging their existing processing capacity to appropriately transform these raw materials into human food and animal feed, and characterizing dietary components along the value-chain from the field, as processed, as fed and as metabolized to link bioactives with clinical endpoints.

Jessie Hunter of the USA Dry Pea and Lentil Council of the American Pulse Association presented on *Dry Peas, Beans, Lentils and Chickpeas: The Future of Food*. She started with describing what a pulse is (one of the most versatile foods on the planet and are comprised of dry peas, lentils, chickpeas and beans). Pulses are good sources of protein, an excellent source of fiber, are high in anti-oxidants, iron rich, a good source of potassium and an

excellent source of folate. Also, they are gluten, sodium, and cholesterol-free. These crops are also very sustainable, serving as natural fertilizers, which are drought-resistant, frost-hardy and have a low carbon footprint. Pulses are a water-efficient source of protein, and thought to be the sweet-spot in consumer trends.

In addition, representatives from traditional proteins including beef, turkey, eggs, dairy and pork, served on a panel to discuss innovations in their areas. The panel presentations tied in well with each other and with the other topics presented and discussed during the day. All agreed that there is room for proteins from a wide variety of sources, both alternative and traditional. Demand will continue to increase due to both consumer preferences and population growth.

"The overall demand for protein is growing rapidly, as shoppers recognize protein's value to the human body," said Karin Schaefer, executive director of the Minnesota Beef Council. "There are great opportunities for traditional proteins to continue to gain market share, while also exploring new alternative proteins."

As evidenced by the quality of the presenters, the wealth of information provided and the key discussion and interaction of AURI's expert Industry Thought Leaders, a day like this provides countless opportunities to help advance value-added agriculture in Minnesota through the work that AURI does as well as its partners.

Industry thought leader groups are a key piece of AURI's Innovation Network Program. The purpose of the Innovation Network Program is to actively engage thought leaders, business and industry, commodity groups, stakeholders and academia to accomplish AURI's value-added mission. The outcome sought is improved competitiveness of businesses and entrepreneurs through ongoing, purposeful connection of resources and partners along the value chain and increased knowledge of opportunities, technologies and trends. For more information, please contact Nan Larson at 507-537-6020.



Dupont's SUPRO® MAX structured vegetable protein is a unique combination of soy and wheat protein combined with wheat starch, designed to give meat-like fibrosity and texture in a number of applications.



1992

1994

1998

2000

BY DAN LEMKE

As an innovative nonprofit organization just getting itself established, AURI leaders understood the need to communicate with various audiences. AURI had begun operating autonomously in 1989 and needed to inform stakeholders about what the organization was doing, its progress and successes, as well as news items from the world of agriculture innovation.

The solution devised by AURI staff and directors was to publish a quarterly newspaper. Former Communications Director Cindy Dorn had just joined AURI after previously owning and publishing a rural Minnesota newspaper, so she took the concept and implemented it. In January 1992, the first issue of *Ag Innovation News* rolled off the presses for delivery to 4,000 recipients.

While the organization needed to share information about its activities, there was also a desire to make the publication educational and fun to read.

“We had a lot of projects that were scientific by nature, so we needed a way to make the information reader-friendly,” says Dorn. “We also had a lot of brochures describing our programs, so we decided to condense our communication tools into one piece.”



Telling Stories

Dorn headed up the early communication efforts that involved several staff members and a handful of outside writers. It was soon apparent to the team that to foster agricultural innovation, *Ag Innovation News* needed to tell stories. The newspaper couldn’t just relay information about what AURI was doing, it needed to shine a light on the challenges and successes ag-based businesses and entrepreneurs faced when trying to commercialize new uses for agricultural products.

“Every person has a story and every product has a story,” Dorn says. “There’s a reason we have wheat-based cat litter. Someone had the crazy idea that this might work.”

Dorn, subsequent communication directors and writers have carried on this tradition of storytelling for the past quarter century. In all that time, the newspaper held to the principle of reporting the successes and challenges of entrepreneurship, innovation and value-added agriculture.

“There was always a wild idea and an entrepreneur willing to give up his retirement fund to invest in an idea,” Dorn says. “When someone is considering an idea, they needed to read and hear about people who made it and those who didn’t.”

Because of Minnesota’s agricultural diversity, there is rarely a shortage of AURI clients or innovative projects to highlight. Over the course of its publishing, *Ag Innovation News* has included articles ranging from on-farm cheese production and agricultural biomass-powered greenhouses to biobased plastics and the birth of Minnesota’s biofuels industry. Innovative companies have developed ag-based fire suppression products, ethnic meat products and methane digesters. Their stories and hundreds like them have filled the pages of *Ag Innovation News* for the past two and a half decades.

While *Ag Innovation News* tells the stories of Minnesota businesses and entrepreneurs, ideas and initiatives brought by AURI’s staff are often industry leading. Though not attached to any companies or entrepreneurs, expert staff recognize emerging opportunities worthy of further evaluation. These forward-thinking projects also provided ideas for enlightening articles.

Former Communications Director Cindy Dorn with early editions of the *Ag Innovation News*.



Looking Back at

‘EVERY
PERSON
HAS A STORY
AND EVERY
PROJECT
HAS A

– Cindy Dorn
Former Communications Director

AURI is looking forward to the next 25 years of *Ag Innovation News*. If you have topics you want to see covered in the future, email us at info@auri.org or follow AURI by taking the online reader survey.

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innovation



2004



2008



2010



2015

25 years of AIN

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y Dorn,
ications Director

ation News and we want your input! If there are stories or
News@auri.org. Also, be sure to share your thoughts with
ey, which can be found at auri.org/AIN.

A Picture is Worth a Thousand Words



Other than the very first publication, Duluth-based photographer Rolf Hagberg's work has been part of every *Ag Innovation News* issue. Hagberg's photography features prominently throughout the issues.

That's not by accident.

From the beginning, Dorn's vision was to incorporate images that did more than just supplement the story. The vivid photographs were meant to draw readers into the pages to learn more.

For Hagberg, the process of getting compelling images involves more than simply showing up at a business or farm to take some photos.

"I first try to figure out more about who they are and what they do, then imagine photos of how I can represent that," Hagberg says.

Hagberg says photo shoots usually involved portraits of the people involved along with product shots. But he was always on the lookout for powerful images.

"I knew the story would be told in the writing, but my goal is always to find the magic photo. Sometimes it was easy, sometimes we needed to do something fun," Hagberg says.

Hagberg's fun has involved convincing an AURI client to lie on the floor with his head protruding from a cardboard box filled with biodegradable packaging peanuts. One on-farm shoot Hagberg had to photograph goats from atop his van. Still another time involved having AURI staff blow wheat flour from a small PVC pipe through an open flame to capture the resulting mini-explosion.

"I love the fact that I've been able to be creative," Hagberg says. "I like that they have faith that I'll be able to come back with something we can use."

From relatively humble beginnings, *Ag Innovation News* has grown, matured and now goes to more than 12,000 subscribers with thousands more viewing it online. Schools, legislators, farmers and entrepreneurs all receive the latest news from AURI. For 25 years, *Ag Innovation News* has shown the power of the entrepreneurial spirit and highlighted that innovation never stops.

A Writer's Thoughts on AIN

My first introduction to *Ag Innovation News* came while I was a television news director. I would glance through various publications looking for stories that worked well as local stories. From the beginning, something about this publication resonated with me - something very real about the people in the articles and something very noble about AURI's mission.

Little did I know that not long after seeing *Ag Innovation News* for the first time, I would go to work for AURI. I was blessed to be communications director for more than 15 years and deeply involved with *Ag Innovation News*. It has been my pleasure to share the stories of agriculture innovation and the people who drive the ideas.

Although I left AURI in 2011, I still occasionally write pieces for the publication, which is an honor. More than 20 years after first laying eyes on it, I still think there's something special about AURI and *Ag Innovation News*.

Here's to the next 25.



TOP: Long-time AIN photographer, Rolf Hagberg.

MIDDLE: Former AURI Communications Director Dan Lemke getting ready to shoot some early video for AURI.

BOTTOM: Rolf Hagberg can attest to the fact you never know what might happen when taking photos for AURI.



PHOTOS BY ROLF HAGBERG



Dr. Sam Baidoo (center) of the Southern Research Outreach Center in Waseca, MN, and AURI's Alan Doering (right) evaluating liquid swine feed for the coproducts focus area.

A Profile of AURI's Coproduct Focus Area and Pilot Lab

BY ALAN DOERING

Located in AURI's office in Waseca, the coproduct utilization laboratory is a unique facility equipped to test, analyze and develop new products utilizing agricultural leftovers. This includes crop residue, ag-processing coproducts, biomass and many other raw materials that are of relatively low value in their initial state.

The coproduct lab can provide assistance in the formulation of solid biofuels, soil amendments, erosion control products, animal health products, new livestock feed opportunities and much more. This lab is a key resource for Minnesota businesses seeking to add additional revenue streams by adding value to ag residue products. It is also a highly sought-after resource for the development of renewable energy opportunities.

AURI's Coproduct Pilot Lab offers a number of services to clients and industry partners, including:

<p>Product and process development of 5lb-200lb batches</p>	<p>Grinding, milling, size reduction, blending, forming, pelleting, cold press extrusion, cooling, drying and particle separation.</p>	<p>Sourcing outside equipment supplied by independent equipment manufacturers.</p>	<p>Product characteristics such as density, particle size, moisture, sorbency and many more.</p>	<p>Start-up production runs to produce sample product or feed for trial consisting of 200- 4,000 pound batches</p>
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The coproducts lab has been responsible for a number of successful projects over the years. While there are too many to list in this article, some highlight projects include:



USA Solutions
Waite Park, MN

AURI assisted this company in identifying a toll manufacturer located in Minnesota to produce a compostable swine mat utilized in farrowing and nursery swine facilities. In addition, AURI scientists also helped determine compostability characteristics, structural strength, and flame resistance. This biobased mat utilizes agricultural coproducts and is compostable when the lifespan is exhausted to aid in breaking any possible disease cycles as well as displacing petroleum-based mats.



Alternative Energy Solution/Pork & Plants Greenhouse
Altura, MN

AURI's Coproduct Pilot Lab assisted with developing an agricultural-based pellet fuel, produced from mixed perennial grasses and crop residues to displace the use of propane to heat greenhouses. AURI assisted with biomass characterization for energy characteristics along with equipment requirements to produce the pellet fuel.



Suntava/HFI
Afton, MN

AURI's Coproduct Pilot Lab continues to provide material processing assistance to aid with Suntava's continued process and product improvement developing natural based 'superfoods'.



Minnesota Valley Alfalfa Producers
Priam, MN

AURI assisted MnVAP in the development of new agricultural coproduct-based fibers and proteins to serve as an alfalfa pellet supplement when alfalfa prices were high, resulting in expanded commodity utilization and marketing opportunities for this Minnesota cooperative. Feed trials indicated similar to improved performance over conventional alfalfa pellets.



AURI and University of Minnesota Project Collaborations – AURI and the U of M-Southern Research and Outreach Center
Waseca, MN

AURI and the University of Minnesota collaborated on a variety of coproduct research projects ranging from utilizing wet distillers' grains in swine feeding systems and diets with very favorable outcomes. Secondly, AURI collaborated on evaluating various forms of agricultural coproduct based ash from various combustion systems to evaluate the nutrient availability for crop production. Lastly, AURI collaborated with the U of M to evaluate the potential to feed glycerol, a coproduct from biodiesel production, as a corn replacement in beef diets when corn values were greater.



They call it ‘Food Building’

Hand-crafters believe you really will want to see how the salami is made

WRITTEN BY JONATHAN EISENTHAL

If Willy Wonka made sandwiches instead of candy, says Tom Brossart, he might have started “Food Building.”

But instead it was the real-life Kieran Folliard, of Kieran’s Irish Pub fame, whose eyes began to twinkle at the idea of an artisanal sandwich factory. You don’t need a golden ticket to see with your own eyes how Red Table Meat Co. processes its pork. Or Baker’s Field Flour and Bread Co. baking wheat and rye loaves. Both entrepreneurial food companies live under one roof in a 26,000-square foot industrial space in northeast Minneapolis.

Brossart gets word, image and video of Food Building’s food making out to the world via the Internet.

“There’s a really strong history in several cultures of dry-curing meats and aging cheeses and stone-milling flour and baking naturally leavened bread,” says Brossart. “The innovative part is connecting that legacy to as many people as possible in our modern context.”

In three short years, the meat and cheese products of Food Building have found a national consumer base. Seeing how the food is made is a key part of that.

Even if you are stopping in to the Black Trumpet in Portsmouth, New Hampshire, for a sandwich made with Red Table’s savory salami, you can visit FoodBuilding.com on your phone and take the virtual tour designed by Brossart. Winding your way through the building’s hallways and stairs until your screen shows the view through plate glass windows, you can watch Mike Phillips and his team of expert butchers take apart a pig. Or, if you are in the neighborhood, you can catch the show in person.

“It’s more than some people bargain for,” laughs Jen Wagner-Lahr, senior director of innovation and commercialization for AURI. AURI did not work directly with Food Building or its companies, but many Minnesota food entrepreneurs find their way to AURI’s food scientists and project staff.

The theme of Food Building is: “Farmed near, made here!” according to Brossart, a fitting motto for the rising local farm-to-table food movement.

“Food Building is part of something bigger going on in the Twin Cities and across Minnesota,” says Lahr. “It’s a dynamic environment, a whole new entrepreneurial food ‘ecosystem’ where connections and conversations are creating new things all the time. At AURI, we are excited to see these developments and be a part of this conversation. It really facilitates delivery of our services, to be able to work in a ‘connected community’—one that leverages what everyone else is offering.”

The foundation for craft food innovation in Minnesota is its nation-leading grocery coop scene. With more than forty different food coops dotting the state from Moorhead to Albert Lea, food crafters have unparalleled access to a consumer audience hungry for what they are providing. Minnesota has nearly twice as many food coops as either New York or California. The coops make a point of devoting shelf space in a way that spotlights food entrepreneurs, says Wagner-Lahr.



AURI *Extends* Survey Deadline

In an effort to give more readers the opportunity to take part in the *Ag Innovation News* survey announced in the last issue of the newspaper, AURI is extending the deadline to May 31st!

As the AIN moves through its 25th year of publication, the paper's editorial staff is considering the paper's strengths, weaknesses and areas of opportunity for the future. This is where you come in. By participating in the survey, you can play an important role in this publication's future.

By giving AURI your opinions as a reader, you can help ensure AIN remains the most interesting, engaging and informative publication in the value-added agriculture sector. Tell us what you think the paper does well? Where could the editorial team make improvements? What can AURI do to make this publication even better?

The survey, which should only take 5-10 minutes of your time, will ask a variety of multiple-choice questions about your preferences with regard to the newspaper. To take the survey, visit auri.org/AIN.

The best part is that every reader who takes the survey is entered into a random drawing for one of three \$50 Visa gift cards—a thank you gift from AURI for taking the time to complete the survey.



Share your opinions and be entered to win one of three Visa gift cards!

auri.org/AIN

ELSEWHERE IN AG INNOVATIONS

BY AURI

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



Can a Drone Do the Work of Honeybees?

Recently, a Japanese chemist named Eijiro Miyako discovered a new way to assist natural pollinators in the wild with technology. Miyako has developed a system that combines a proprietary gel with a tiny, insect-sized remote controlled drone, to pollinate plants and flowers.

Motivated by concerns about climate change and the impact it was having on bees and other insects, Miyako believes, “the technology and artificial pollinators could be hopefully promising for giving us a good solution against the pollination crisis for our beautiful planet.”

To devise an effective artificial pollinator, though, he needed some kind of flying machine to transport the pollen. He found an insect-sized, remote-controlled four-propeller drone, worth about \$100 and attached horse hair to it in order to mimic the fuzzy exterior of a bee.

Miyako then flew the little drone—with hair and gel attached—over the flowers of pink-leaved Japanese lilies. The little flyers picked up pollen and the researchers guided them to other flowers, where they deposited the grains, artificially pollinating the plants.



Edible Food Packaging Made from Milk Proteins

Most foods at the grocery store come wrapped in plastic packaging. Not only does this create a lot of non-recyclable, non-biodegradable waste, but thin plastic films are not great at preventing spoilage. Scientists are now developing a packaging film made of milk proteins that addresses these issues — and it is even edible.

To create an all-around better packaging solution, a team at the U.S. Department of Agriculture is developing an environmentally-friendly film made of the milk protein casein. The film is up to 500 times better than plastics at keeping oxygen away from food and, because it is a milk derivative, is biodegradable, sustainable and edible.

In addition to use as plastic pouches and wraps, this casein coating is sprayable onto food, such as cereal flakes or bars. Right now, cereals keep their crunch in milk due to a sugar coating. Instead of all that sugar, manufacturers could spray on casein-protein coatings to prevent soggy cereal. The team behind this innovation are still working to make improvements, but are confident the first commercially available products will hit the shelves within three years.



Fly Farms to Provide Alternative Protein for Animal Feeds

Recently two companies have partnered together to build 25 fly farms a year for up-cycling organic waste into insect protein for animal feeds.

Using a high-tech blueprint developed with Christof Industries, AgriProtein plans to rear fly larvae at an industrial scale on organic waste that would otherwise go to landfill and harvests the larvae to make natural, high-protein feed products as a sustainable alternative to fishmeal and soybean meal. The fly farms will be operated by local licensees of AgriProtein technology in Asia, the Middle East, Europe and the Americas.

AgriProtein CEO Jason Drew said, “Waste-to-nutrient technology is starting to get traction and price per tonne is key in the fight to replace fishmeal. Christof's expertise has enabled us to boost output and reduce costs, making us even more competitive and giving us a sound model for rapid global expansion.”

Christof Industries CEO Johann Christof said, “We now have an EPC model to deliver cost-efficient, high-volume fly farms anywhere in the world. The demand for sustainable insect protein is growing rapidly and as AgriProtein's partner we will help meet that demand.”

Ecowatch

Science Daily

agwired.com

AURI'S FOCUS AREAS QUIZ

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

Food Products

After wheat, rice and corn, what is the 4th largest overall food crop grown on earth?

- a. Potatoes
- b. Ginger
- c. Peapods

Answer: a

Renewable Energy

Which US city has committed to 100% renewable energy by 2032?

- a. Washington, DC
- b. Moab, UT
- c. Portland, OR

Answer: b

Coproducts

Which of the following are recent AURI coproducts projects?

- a. Exploring alternative feed ingredients for use in aquaculture feeds to replace fishmeal
- b. Assisting in turning agriculture fibers into a charcoal-like residue, called biochar, that can be used for absorbing liquids, improving water quality and soil characteristics, and creating energy
- c. Help develop, formulate and test a lower-cost, blended-fiber alternative to alfalfa feed pellets
- d. All of the above

Answer: d

Biobased Products

How many Biodiesel jobs are there in the U.S.?

- a. 32,000
- b. 48,000
- c. 76,000

Answer: b

ABOUT AURI

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

Service Areas: What AURI Provides

Applied Research

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

Hands-on Scientific Assistance

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


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

Innovation Networks

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

Learn More

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

 Join the conversation on Facebook at [AgriculturalUtilizationResearchInstitute](https://www.facebook.com/AgriculturalUtilizationResearchInstitute)

 Follow us on Twitter at @AURIcomm

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Agribusiness

Agriculture Innovation

Partnership Program

Benefitting Minnesota's value-added agricultural businesses



In an effort to develop more value-added ideas with the potential to benefit Minnesota's value-added agricultural businesses, entrepreneurs, agricultural processors and farmers, AURI launched a new venture this year called the Agriculture Innovation Partnership (AIP) program. It aims to further AURI's collaborative efforts with partner organizations to develop opportunities to add value to agricultural products through practical, applied research.

Information generated by the AIP program will be shared throughout the applicable industry, utilizing AURI's media channels and its Innovation Network events. The overall goal is to provide important game-changing information to translate opportunities into marketable processes and products, ultimately resulting in economic impact.

To apply for this program, proposals must be submitted by May 15th and topics must adhere to the following criteria:

Align with AURI's Mission:

Information generated from proposed initiatives must have potential to add value to a Minnesota agricultural product and foster long-term economic growth.

Potential for Industry Wide Impact:

Proposals must clearly address an agricultural industry need or opportunity. At the onset of an initiative, successful applications must articulate how the scope of work will benefit industry and estimate when that benefit is likely to occur. Proposals must include dissemination plans and an explanation of expected measureable economic impacts. In addition, proposals should demonstrate strong partnerships and collaboration.

Public Domain:

Findings are public information. Therefore, proposals should not include information that is proprietary in nature or request funding for research that would likely yield proprietary information.

Any Minnesota organization, research entity, individual, or business is eligible to apply and receive funding, including farmers, farmer networks, institutions of higher education, research institutions, nonprofit organizations, agricultural cooperatives, and agricultural businesses.

Interested individuals should review the AIP guidelines for further details related to program criteria, eligibility and the application process. These are available from AURI at auri.org/AIP

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