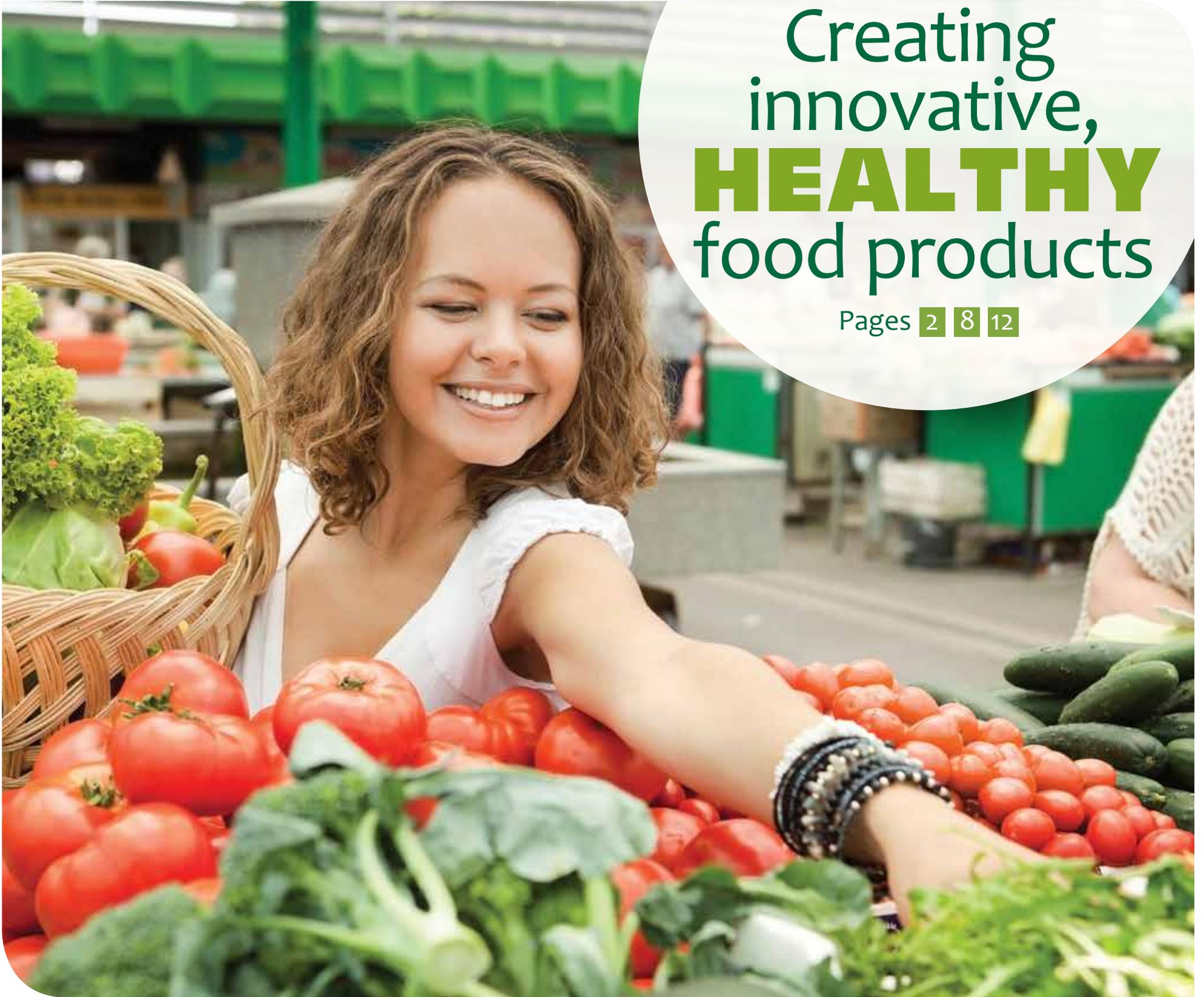




# Ag Innovation News

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The newspaper of the Agricultural Utilization Research Institute



Creating innovative, **HEALTHY** food products

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# A snack with gusto

Gustola Granola—made by a Gustafson—is healthy new snack

Angie Gustafson is the innovator behind Gusto Granola.



PHOTOS BY ROLF HAGBERG



Gusto Granola comes in four delicious flavors.

BY DAN LEMKE

Dating back to her college days, Angie Gustafson has always been a big fan of farmers markets and the local food scene. A stint in the Peace Corps exposed her even more to open air markets and the joys of locally-produced food. So it was only logical that when she started marketing her own homemade granola, the local farmers market was the place she would start.

Gustafson is a full-time mom to four active kids, including three teenage boys. She is also a runner who was looking for a healthy, go-to snack. Since she also enjoys cooking, Gustafson began experimenting with her own granola. She often shared the granola with friends and gave it out as gifts. After getting very positive feedback, she made the leap to try selling Gustola Granola at the Linden Hills farmers market beginning in 2013.

"We started at the farmers market and developed a nice fan base," Gustafson

says. "Once it ended in October, we had people asking where they could get it."

Soon after the farmers market closed for the season, Gustafson met with the manager of the Linden Hills Co-op to find out what it would take to get Gustola Granola onto store shelves. After meeting with Gustafson and tasting the granola, she was told "we want it, and we want it now."

## Stiff competition

High school grocery experience and a degree in marketing provided some preparation for entering the food business, but Gustafson admits there is stiff competition for store shelf space. Even so, she says her product is well received because of what goes into the bag.

"Mine has a uniquely rich taste, a fantastic crunch and large chunks that people love," she says. "I use expensive ingredients, but it's a difference you can taste. I use rolled oats, egg whites, olive oil and local, real maple syrup."

To get the granola on store shelves, Gustafson needed nutritional analysis and label information. As owner of a small, startup company, Gustafson relied on some of her food industry contacts who directed her to Charan Wadhawan at AURI's Crookston food lab. Wadhawan provided technical assistance "that was a huge help for me to get onto store shelves," Gustafson adds. In addition to helping with the nutritional and labeling information, Wadhawan also offered shelf-life guidance and assistance in compliance with regulations.

Because the granola is sold for retail, production moved from her home to a commercial kitchen in Minneapolis.

## Going for the gusto

The unique Gustola Granola name is derived from a combination of Gustafson's last name and how she operates her business—with gusto. It comes in four flavors: almond-pecan-cashew, hazelnut-walnut-blueberry-cranberry, almond-coconut-cherry and pistachio-pumpkin seed-coconut-cherry.

Currently, the snack is available at whole foods stores and co-ops such as the one in Linden Hills and The Wedge Co-op in Minneapolis. But with her marketing background and belief in her product, Gustafson's aiming for more outlets including major outdoor retailers.

"You can take it anywhere and eat it anytime. It really resonates with active folks because it has simple ingredients," Gustafson says. "Wherever it goes, it sells."

Gustola Granola is building a following and finding success on store shelves. New packaging suitable for the artisan granola is in the works. It's all part of a process to which she and her family are committed.

"It can be a challenge when you are a startup, but if you want to get it into this market, you have to go big," Gustafson adds.

Check it out at [gustolagranola.com](http://gustolagranola.com).



Gusto Granola is made from delicious ingredients including rolled oats, egg whites, olive oil and local, real maple syrup.



**AURi and Gustola Granola**

### Idea to reality:

Angie Gustafson wanted to expand the sales of her popular Gustola Granola beyond the Linden Hills Farmers Market.

### AURi's role:

AURi scientist Charan Wadhawan provided nutritional analysis, labeling information, shelf-life guidance and assistance in compliance with regulations to help get the product on store shelves.

### Outcome:

Gustola Granola is now available in several co-ops and has a growing market.

# Agriculture processing industry **positive** about future economy

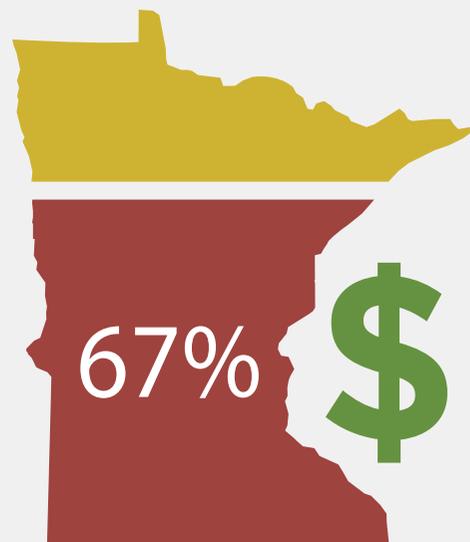
*Recent AURI survey looks at industry trends*

AURI is all about helping businesses and entrepreneurs who use Minnesota's agriculture products in areas such as food and renewable energy. In order to better serve these clients, the institute contracted with Russell Herder to complete a survey of the agriculture processing industry. With 235 surveys completed, the responses show that the industry is generally positive about the future and that there are several trends that provide great opportunity for growth.

## A positive outlook

"The agriculture processing industry is optimistic about the future," says Jen Wagner-Lahr, AURI senior director of innovation & commercialization, "Sixty-seven percent of the respondents foresee their gross revenues expanding in the next two years, and only five percent see their revenues decreasing.

"In addition, 60 percent plan to increase their use of agriculture commodities. At a time when agriculture commodities are facing price challenges, this is good news."



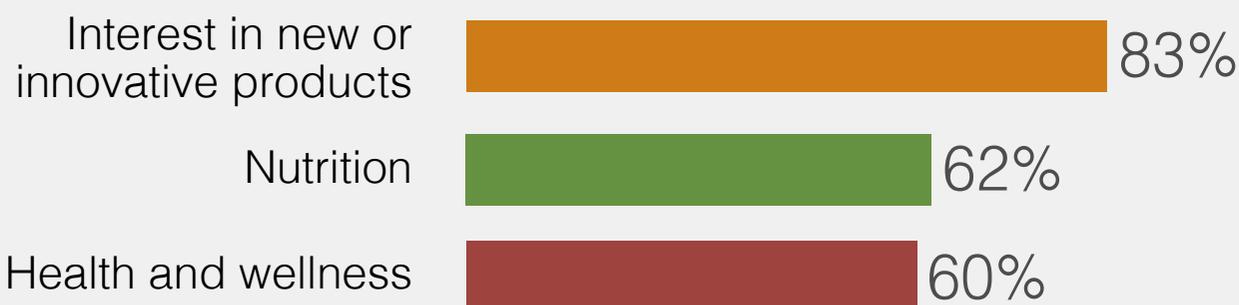
67% of Minnesota manufacturers say their gross revenues will expand in the next two years

## Consumer trends

One of the primary goals of the survey was to better understand how consumer trends are impacting the industry, and to know how AURI could help businesses take advantage of those trends to grow their businesses.

"When asked about the impact of consumer trends on their business, 83 percent of respondents said that interest in new or innovative products would have a positive impact on their business," explains Michael Sparby, AURI senior project strategist. "And it is clear that nutrition, health and the environment are huge opportunities for the Minnesota economy because so many businesses see those trends as having a positive impact on their business."

*Consumer trends that Minnesota manufacturers say will positively impact their business*



"Agriculture processing is a tremendous industry for our state, as it takes what is being grown in the rural fields of our state and puts those commodities to use in innovative products and processes, made by people and businesses across the state," explains Wagner-Lahr. "The positive outlook for this industry paints a picture of an exciting future."

More information about this industry survey will be available in the near future on the AURI website and featured in the next issue of *Ag Innovation News*.



## Unlocking the nutrients in biomass



### AURI testing calcium hydroxide treatment to boost fiber digestibility

BY LIZ MORRISON

#### AURI is testing a way to make corn stover and other biomass more nutritious for livestock.

Lignocellulosic biomass contains plenty of nourishing carbohydrates, but they are locked up in complex chains of molecules, making them hard to get at. Although the technology isn't new, researchers at AURI's coproducts lab in Waseca are using an alkaline solution to break down the bonds and release the nutrients so they are easier to digest.

The process "takes low-quality roughages and improves the available energy for dairy cows, beef cattle, and sheep," says Al Doering, AURI coproducts scientist, who is leading the trials. The research could add value to crop residues and perennial grasses, while cutting livestock feed costs and expanding biomass uses.

Calcium hydroxide, or slaked lime, is mixed with water and applied to chopped biomass. The treated material, which is about 50 percent moisture, is then packed into a bunker or bag and ensiled for 30 days. The cured feedstuff can be substituted for a portion of corn and hay in ruminant livestock rations.

"This technology has excellent potential to create new sources of high quality animal feed from underused resources," Doering says.

AURI will test the calcium hydroxide process on a wide range of Minnesota-grown biomass to identify which plant fibers produce the greatest nutritional returns. Trials will include cash crop residues, such as corn stover and cereal grain straws, as well as perennial grasses, such as switchgrass, brome grass and fescues, which are often grown on erodible or marginal land.

AURI's preliminary lab trials suggest that calcium hydroxide treatment boosts the energy content of some crop residues — including corn stover and barley straw — by more than half, Doering says. That would make them nutritionally comparable to medium/low-quality alfalfa hay. "We'll need to see a big jump in nutritional energy availability to offset the processing costs. Secondly, lower corn prices may have an effect on economics."

AURI will also test the feasibility of pelleting treated biomass to make it easier to ship — but that's a long shot, Doering says. "I see this primarily as an on-farm application — treating forages like silage."

#### AURI to demonstrate technology

This technology has several advantages for dairy and cattle producers, Doering says. Many livestock operations already own baling equipment. Calcium hydroxide is inexpensive, grinding and ensiling equipment is readily available, "and producers could do this themselves on their farms."

Cattle feeding trials have already been done on alkaline-treated corn stover, Doering says, and more trials may follow for other treated fibers that show promise. Beef and dairy cattle producers may be interested in this technology, says Mitch Coulter, research manager for the Minnesota Corn Growers, but growers will need to see feeding trial results.

Later this year, AURI will collaborate with a maker of industrial grinding equipment to demonstrate the processing technique, Doering says. "It's our goal to make producers aware of this value-added opportunity for a variety of fibrous feedstocks."



# Building a bio-economy, step by step

AURI's research on processing biomass for livestock feed is part of a larger effort to expand biomass production and use in Minnesota.

Biomass sources such as cover crops, perennial grasses and forages offer significant soil and water conservation benefits, says Nick Jordan, a University of Minnesota professor of agronomy and plant genetics. He is leading a trans-disciplinary research program that aims to increase biomass crop production in Minnesota. The goals are to foster soil and water conservation and boost rural economic vitality.

"Building Community-based Bioeconomies" — funded by \$1.3 million in federal and state grants from the U's MnDRIVE program — brings together scientists and engineers in the fields of agriculture and biosystems, computing, robotics, landscape architecture and regional planning. "We're taking a comprehensive, system approach," Jordan says.

His diverse team is working with residents of the Seven Mile Creek Watershed south of St. Peter, Minnesota, on ways to incorporate more biomass crops on the landscape. In workshops last year, participants used interactive computer models to explore the economic and environmental costs and benefits of alternative cropping systems in their watershed.

"Perennial crops could be an option for farmers on marginal lands," says Mitch Coulter, research director for the Minnesota Corn Growers. But increasing the number of biomass acres in corn and soybean country will first require profitable biomass markets, says AURI coproducts scientist Al Doering.

To that end, Jordan's group is also examining new technologies for refining biomass — either for livestock feed or for conversion to biofuels and biochemicals.

One such technology is the calcium hydroxide and ensiling treatment that AURI is testing for on-farm use. "This is one of the cheapest and easiest processes now available" for breaking down cellulose, Doering says, and "the one that probably makes the most economic sense now."

Another technology, developed at Michigan State University, uses ammonia to unlock the sugars in corn, wheat and rice residue, and perennial grasses. The process, known as AFEX, is more expensive, Doering says, but costs could come down as the technology advances.

Other biomass refining technologies are also nearing commercialization, Jordan adds. These innovations could spark new rural enterprises, such as feed processing plants, he says. "There's a wide range of products that can be made from biomass."



PHOTO FROM THE UNIVERSITY OF MINNESOTA

"Building Community-Based Economics" brings together scientists and engineers in the field of agriculture and biosystems, computing, robotics, landscape architecture and regional planning. The team is working with residents of the Seven Mile Creek watershed near St. Peter, Minnesota, on ways to incorporate more biomass crops on the landscape.



## AURI and Biomass Refining

### Idea to reality:

Increased biomass crop production would benefit Minnesota's soil and water quality, but farmers need profitable markets for biomass.

### AURI's role:

AURI is testing a refining process that increases the digestibility and nutritional value of biomass for livestock feed. The technology uses a calcium hydroxide solution and ensiling to unlock the nutritious carbohydrates in cellulose.

### Outcomes:

AURI will demonstrate the technology for cattle and sheep producers in 2015.

### Partners:

University of Minnesota



Corn stover (corn stalks, leaves and cobs) is milled in AURI's coproducts laboratory in Waseca for research associated with improving the digestibility for animal feed.

# Building on biochar

## Patented technology has many benefits



Using parts scavenged from an old combine and a wood furnace, the entrepreneurs behind Char Energy developed a portable gasification unit that could convert biomass, such as the wood shown above, into biochar while also producing syngas.

BY DAN LEMKE

The inspiration for a newly-patented mobile gasification unit (Patent #8888874) came when Curtis Borchert's wife read about the benefits of biochar for improving soil quality in an organic gardening magazine. Borchert, of Ada, Minnesota, attempted to produce biochar for his wife's garden by sealing wood from the family's Christmas tree in a popcorn tin and tossing it into a wood burning stove. That experiment ended with a pile of charred material on the floor, blaring smoke alarms and an unhappy guide dog. But it provided the spark that helped ignite a new business and new opportunities for biomass.

Biochar is created through the carbonization of biomass materials like wood or crop residue, usually accomplished through processes such as pyrolysis or gasification that involve charring the product in the absence of oxygen. Char has been used for centuries as a soil additive to help increase organic matter and retain water and nutrients.

Borchert and his business partners Brian Borgen of Hendrum, Minnesota, and Noah Storslee of Ada, started their company called Char Energy, LLC to improve upon Borchert's initial popcorn tin idea and develop a working prototype for a mobile gasifier. Using parts scavenged from an old combine and a wood furnace, they developed a portable gasification unit that could convert biomass into biochar while also producing syngas.

Unlike other systems, the Char Energy technology conveys biomass in horizontal tubes through a heat chamber that bakes the biomass to produce biochar and syngas. Some of the gas is recaptured and used to power the mobile system.

The company applied for and was awarded a patent for their technology in November 2014. The patenting process is typically time and resource consuming, especially if there are challenges to the patent. For Char Energy, it took 18 months to get their patent at a cost of less than \$1,000. It also went through the process without a single challenge, which Borchert says rarely happens. That was the case because there is nothing out there quite like it.

Not only is the mobile gasifier technology unique, so too is the char it produces.

"Our char is different because it's baked, the organic matter isn't burned like in an up- or down-draft gasifier," Borchert says. "We can produce consistent biochar every time. We don't have to worry about moisture affecting how it burns. We set the temperature and the biomass doesn't move until the chamber gets to that temperature."

Borchert says they source sugar beet pulp as their primary feedstock because it's readily available, is a consistent product and feeds well through their system due to its particle size. However, the system can work on nearly any available organic material from wood to hay.



The mobile gasifier unit from Char Energy can turn biomass into biochar, which can be used to improve the soil. Pictured above are charred sugar beets, corn cobs, twigs, pine needles, wood chunks and sugar beet pulp.

R



The above photo demonstrates that the charring from the mobile gasifier is consistent throughout this wood sample.

AURI has been working with Char Energy since 2011, gathering data to show what their technology was actually producing. This information was also used to help support the patent application.

“They are really innovative in their process,” says Becky Philipp, AURI project manager. “They are so creative in how they use all their available resources.”

Using the char for improving soil was the initial intended use, but after conversations with AURI staff, other potential opportunities became clear. In addition to the land applications, the char was also tested as a renewable fuel source. Next steps include evaluating it as a filter material for removing nutrients to improve water quality.

The char’s current primary use is for oil absorption. The char is placed in burlap bags to contain and absorb crude oil that is spilled when large tanks are moved.

AURI scientist Alan Doering worked with Char Energy to test their biochar for several different applications. What he found was a pretty remarkable and very thirsty product.

Doering says one gram of biochar can absorb nearly 20 grams of oil, giving it an absorption rate of nearly 2,000 percent. Plus, it is oleophilic, so it resists water, yet absorbs oil.

Whatever the biochar absorbs could be burned without consuming the char, which means it can be used over and over again. The biochar itself could be used as fuel because its energy value can go as high as 11,000 Btu per pound. In comparison, coal averages 6,900-14,350 Btu.

Work also continues to secure funding to test biochar’s capacity for removing nitrates and phosphorous from water runoff.

Char Energy is building another mobile gasifier made with all original parts that they hope to have completed by this summer. They’re optimistic the technology will be of interest to others around the country for producing energy and char. Syngas, another product of gasification, may be able to replace propane in some areas of the country with propane shortages. Farmers have shown interest in using the syngas to dry their grain.

“The only byproducts of this process are syngas and biochar, both of which are usable,” Borchert adds. “There isn’t a waste product that you have to get rid of.”

Char Energy is also hoping to pursue certification for their biochar from the International Biochar Institute. It’s all part of the process of growing the business.

“We wouldn’t be where we are today without help from AURI,” Borchert says. “They’ve helped us come up with a lot of ideas like using the char on oil and for water quality. Having these folks around has been a big help for us.”



## AURI and Char Energy

### Idea to reality:

Build a mobile gasifier that can turn 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.

### AURI’s role:

AURI gathered data to find out what chemicals and nutrients were in the

biochar and tested its absorbency. Further work on this high-potential project is ongoing.

### Outcomes:

Char Energy was awarded a patent for their technology in November 2014. One future goal is to test the biochar’s capacity for removing nitrates and phosphorous from water runoff.

PHOTOS BY ROLF HAGBERG



PHOTOS BY ROLF HAGBERG

“Instead of putting a bag of chips in their backpack, I hope people will put in a Kakookie.”

—Sue Kakuk



Sue Kakuk, creator of the nutrition-packed Kakookies.

## Bicycle-inspired Kakookies offer a healthy alternative

BY DAN LEMKE

The whole idea just seemed wrong to Sue Kakuk. Her daughter, a competitive collegiate bicyclist, would travel around the country to race, powered by nutrition from a less than ideal source.

“They would pack up their bikes and vans for the weekend and have teams of 15-20 people crash on the floor of someone’s home,” Sue Kakuk says. “They would race 50-80 miles one day, then get up and do it again the next day. When I asked what they ate for breakfast, my daughter said ‘donuts.’ I just didn’t feel right having them burn that much energy from donuts.”

An avid cook, Kakuk experimented with different ingredient combinations for a healthier breakfast alternative. She eventually hit on a winner and began making oat-based breakfast cookies to give racers a healthier, more energy-packed option.

After her daughter graduated from college, Kakuk and her family continued to host bicyclists in their Plymouth, Minnesota, home when teams came to town for races. And of course, she would give them some of her cookies. After years of giving away her baked goodies, Kakuk’s husband suggested they try to make it into a business.

### A seasoned veteran

Kakuk is an accomplished cook with a background in kitchen design. She has entered numerous recipe contests and has twice been a finalist in the Pillsbury Bake-Off. Experimenting with recipes comes naturally.

“Cooking came easy to me because I could improvise and the meal would still turn out,” she says. “Baking is more precise so it was more challenging with my creative nature to achieve good results.”

After taking feedback from those who have eaten her cookies and experimenting with different ingredients, she developed an allergy-free recipe that contains no eggs, gluten or dairy. She ditched the flour and instead relies on nuts, oats and fruit to make her healthy offering called Kakookies.

Kakookies come in four flavors: almond-cranberry, boundary waters blueberry, cashew blondie and pecan-apricot. Kakuk says there are other flavors in the works, but those have yet to hit the market.

“These are made with simple ingredients,” Kakuk adds. “I’m very proud of how clean the nutritional labels are because there aren’t any artificial ingredients in them.”

AURI scientist Charan Wadhawan worked with Kakuk on nutritional analysis, shelf-life guidance and navigating regulations.

“AURI was extremely helpful. Part of my success is the fact that I have a clean ingredient label because they’re made with natural ingredients,” Kakuk adds.

“Charan helped walk me through the process that can be very exhausting for a start-up business. It’s very much appreciated.”



### Wheels are turning

Kakuk launched a website in April 2014 to begin test marketing Kakookies. Since then she has added a range of retail outlets including bike shops, coffee shops and food coops from Arizona to New York. They’ve even sponsored a bicycle racing team, “Kakookies Collegiate All Stars Women Team.” Kakuk is currently working on new packaging for her portable, healthy snack.

Kakuk’s entry into the market has been steady and measured. She now contracts with a bakery in Becker to make the Kakookies and has started to work with a distributor that she hopes will help get the Kakookies into the hands of more people.

“Instead of putting a bag of chips in their backpack, I hope people will put in a Kakookie,” she says.

Find out more about Kakookies, including how to order, at [kakookies.com](http://kakookies.com).



### AURi and Kakookies

#### Idea to reality:

Create and sell oat-based breakfast cookies that gives racers, outdoor enthusiasts and busy families a healthy, energy-packed food option.

#### AURi’s role:

AURi scientist Charan Wadhawan provided nutritional analysis, shelf-life guidance and assistance navigating regulations.

#### Outcome:

Kakookies are now available via [kakookies.com](http://kakookies.com) and in a range of retail outlets including bike shops, coffee shops and food co-ops from Arizona to New York.



CARISSA NATH, MEATS SCIENTIST



HAROLD STANISLAWSKI,  
PROJECT DEVELOPMENT DIRECTOR



Buying local. Knowing where food comes from. Eating healthier. These are all trends in food consumption, and food hubs are one way that towns and regions are giving consumers more access to local, fresh foods. Food hubs connect growers with local places needing healthy food such as schools, large businesses and health care facilities, and help grow the local and regional economies at the same time.

Food hubs often have four purposes:

1. Aggregating locally grown food from area growers in a central location;
2. Distributing the product to the local organizations and businesses that need it;
3. Marketing the locally grown food; and
4. Training and educating area food entrepreneurs.

Lake Country Services Cooperative (LCSC) in Fergus Falls, Minnesota, started exploring a food hub in order to meet the local schools' need for fresh produce. With the assistance of an active advisory team and partnerships with PartnerShip 4 Health and Minnesota Extension Service, the cooperative is using feasibility grant funds from the Minnesota Department of Agriculture to determine

a startup plan for the food hub. They also received an equipment grant to purchase coolers, a delivery truck, scales and stainless steel worktables to fulfill the packaging and delivery services of the hub. The co-op started their work with market surveys—determining, for example, what growers are interested in selling and what school districts and larger institutions would pay for the produce if it was available.

LCSC recently completed its pilot season, which ran for 12 weeks from September through early November. “We delivered about 36,000 pounds of fresh produce to 11 school districts, health care and day care facilities,” says Jane Eastes, director of operations for LCSC. “We were very heartened to find that people loved the food cooperative and that it worked well for them. We have 80,000 pounds of food promised to be purchased next season—this is more than double what we sold during the pilot season.”

Not only does LCSC have the orders, but they also have committed growers. They’ve matched what’s needed with what’s grown. “We call ourselves matchmakers,” says Eastes.

So what does AURI have to do with food hubs? As the food hub idea grows, we are seeing two needs evolve that AURI staff are equipped to assist with:

**Food safety:**

When food is brought to the hub, some of which comes in large quantities, it has to be handled and processed safely. Food safety should always be top-of-mind when processing food for human consumption. One of the ways AURI is equipped to help ensure food safety is through Hazard Analysis and Critical Control Points (HACCP) training, which helps attendees learn a preventative approach to food safety and reduce risk in the food production process.

**Food processing:**

One of the challenges with food hubs in Minnesota is helping fresh produce last through the longer winter. Further processing—such as dehydration as just one example—could help ensure the healthy food is available throughout the year. In addition, there’s the opportunity for unique products to be made from this produce to help it last a long time. AURI can assist food hubs with its technical expertise in recipe formulation and nutritional analysis.

If there isn't a food hub in your community, keep your eyes out, as it may be just around the corner.

## New directors named to AURI board

The board of directors of the Agricultural Utilization Research Institute welcomed two new members and two returning members at its regularly scheduled January meeting. The new and returning members, as following, are:



**NEW: REP. DEB KIEL**

Representing the Minnesota State House Agriculture Finance Committee. Rep. Kiel and her husband, Lon, own and operate a wheat, soybean and sugarbeet farm in Hammond Township.



**NEW: JERRY HASNEDL**

Representing a statewide farm organization. Hasnedl, a member of the Minnesota Farmers Union, grew his family farm in St. Hilaire, Minnesota, from 600 acres to 3,200 acres from 1980 through today. He was on the CHS (formerly Harvest States) Board of Directors from 1995-2014, serving as secretary treasurer and chairman of the board for part of that time.

**RETURNING: JOHN GILBERTSON**

Representing a statewide farm organization. Gilbertson, a member of the Minnesota Farm Bureau, operates a cow-calf and backgrounding angus herd operation with his son and grandchildren near Puposky, Minnesota.

**RETURNING: ART BRANDLI**

Representing a Minnesota research and promotion council. Brandli, a member of the Minnesota Wheat Research & Promotion Council, farmed in northern Minnesota beginning in 1973 and is now managing a transition from production agriculture to forest and wildlife production for the new owner.

The Institute’s Board of Directors consists of nine members, meeting the following requirements found in statute:

- Chairman of the Minnesota House of Representatives Ag Committee or designee.
- Chairman of the Minnesota Senate Ag Committee or designee.
- Two representatives of statewide farm organizations.
- Three representatives of Minnesota research and promotion councils.
- Two representatives of Minnesota agribusiness.



# Industry Thought Leaders

BY TERESA SPAETH  
AURI EXECUTIVE DIRECTOR

## The Industry Thought Leaders will:

- advise AURI staff and those we serve on trends and hot topics;
- review and provide feedback on studies looking at future opportunities;
- provide input on the direction of future topic-based gatherings in their area of expertise;
- write blogs or columns to share their expertise with AURI audiences; and
- provide feedback on research ideas and review pertinent research.

represented in this group. One of the first goals for this team will be to serve as a focus group and respond to the results of AURI's Industry Analysis (see page 2). Their expertise will be essential in prioritizing the findings from that analysis to determine next steps in meeting industry needs.

It is essential that we have our hand on the pulse of the industry and the needs, opportunities, challenges and trends that drive new products and processes. The food industry in Minnesota is vast, and the interest in new food is constant and ever-changing. AURI's network has always been important in our work, and the Thought Leader teams will take this networking to a more formal and effective level in order to best serve agriculture and our business clients.

Generating new ideas. Selecting those innovations that are most likely to succeed. Implementing ideas in the marketplace to create economic impact. These steps are instrumental to successful innovations that result in new products on store shelves and new processes that reduce waste, save money and create jobs.

None of these steps to successful innovation happen in a vacuum. It takes collaboration and resources to bring an idea to reality. In order to further the innovation that happens at AURI and with the clients and partners we serve, we are beginning to bring together and coordinate Industry Thought Leader teams in each of AURI's core four areas: biobased products, coproducts, food and renewable energy. The teams, which are part of AURI's Innovation Network Program, will consist of a diverse set of industry experts who will serve as a resource for generating and reacting to research in their topic areas.

This spring, AURI is convening the first group of thought leaders—focusing on the area of food. This team of experts, which will be announced publically later this spring, includes experts from higher education, large businesses, small business and private research organizations. We are excited about the diverseness and depth of experience

## ELSEWHERE IN AG INNOVATIONS

BY ASHLEY HARGUTH

*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.*



## Beer for your brain

A compound in hops could help protect brain cells from damage and also potentially help slow the development of brain disorders like Parkinson's and Alzheimer's diseases. Reported in the American Chemical Society's Journal of Agricultural and Food Chemistry, a team is testing xanthohumol, which has other potential benefits, including antioxidation, cardiovascular protection and anticancer properties. The team decided to test xanthohumol's effect on brain cells and found optimistic results.

Sciencedaily.com, January 2015



## Minnesota shrimp

A new land-based aquaculture system will make it possible for producers to grow shrimp anywhere, all year round. Even in Minnesota. Currently, 80 percent of the shrimp consumed in America is imported.

Ralco, an agriculture company based in Marshall, Minnesota, has won its bid to license Texas A&M University's new shrimp farming technology, which would make it possible to produce one million pounds of shrimp per acre of water.

The system would benefit soybean growers because about one-third of a shrimp's diet would be soybean meal. Researchers say this technology will ultimately reduce the price of shrimp, which is also good for consumers.

Farms.com, June 2014

## Agbioscience strategy moves forward



In early 2014, AURI released *Agbioscience as a Development Driver: Minnesota Agbioscience Strategy*, a report by the world-renowned Battelle Technology Partnership Practice, which showed that Minnesota's economic future may well be rooted in its historic leadership in agriculture. The state's agbioscience industry has multi-billion dollar potential, benefits both rural and urban areas and could make Minnesota a global leader in an area critical to our future: food.

Implementing the strategy recommended by Battelle is the key to separating this report from similar studies that have been done before and ensuring that Minnesota sees robust economic growth as a result. Several businesses, government agencies and non-governmental organizations have begun to work on an agbioscience strategy that:

- increases public-private partnerships,
- builds a strong agbioscience cluster to encourage innovation and entrepreneurship,
- aligns open innovation efforts among businesses and organizations, and
- grows investment in research that leads to commercialization.

AURI and many partners have been working diligently on the implementation of this plan for the last year. Some pieces of progress include:

- An analysis of the economic impact of agbioscience—and its future potential—was sponsored by AURI and the Minnesota Initiative Foundations. The study, done by the University of Minnesota Extension's Community Economics team, was recently completed and is being shared first with the initiative foundations and will then be made publically available.
- The Regional Economic Development Group will hear a presentation of the report's findings and discuss its potential at its spring meeting.
- Several scientific and technical studies by AURI and its partners—including the University of Minnesota, Research & Promotion Councils and others—are underway to help commercialize various agbioscience opportunities in the marketplace.
- AURI is working on open innovation—helping to bring the innovations of entrepreneurs to the attention of larger businesses that may be interested and available to help commercialize these ideas on a large scale.

## AURI'S CORE FOUR QUIZ

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

### Food Products

The average dairy cow produces how many glasses of milk per year?

- a. 500
- b. 9,200
- c. 33,000
- d. 46,000

Answer: d

### Renewable Energy

How much of the US energy use is supplied by renewable forms of energy?

- a. 1.3%
- b. 4.4%
- c. 9.3%
- d. 12.8%

Answer: c

### Coproducts

What is a use for biochar?

- a. Absorb liquids
- b. Improve soil characteristics
- c. Create energy
- d. All of the above

Answer: d

### Biobased Products

How many pounds of soy-based grease are used each year by US railroads?

- a. 4,672
- b. 3 million
- c. 2 billion
- d. 26,000

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 to walk clients through the entire development journey of bringing a new product or process from idea to reality.

### Service Areas: What We Provide

#### 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.

#### Development

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](http://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.
- Become a fan on Facebook or follow us on Twitter



## Contact Us

[auri.org](http://auri.org)

**Crookston**  
PO Box 599  
Crookston, MN 56716  
800.279.5010

**St. Paul**  
U of M Biological Sciences Center  
1445 Gortner Avenue  
*(physical address)*  
1475 Gortner Avenue  
*(mailing address)*  
St. Paul, MN 55108  
612.624.6055

**Marshall**  
1501 State St.  
Marshall, MN 56258  
507.537.7440

**Waseca**  
PO Box 251  
Waseca, MN 56093  
507.835.8990



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## ABOUT AG INNOVATION NEWS

Amanda Wanke, managing editor  
Rolf Hagberg, photography  
Design by,



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Address correspondence or subscription requests to:

*Ag Innovation News*  
PO Box 251  
Waseca MN 56093  
507.835.8990  
[awanke@auri.org](mailto:awanke@auri.org)



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# BEE FREE HONEE®

finding sweet success



BY DAN LEMKE

Business partners Katie Sanchez and Melissa Elms are generating quite a buzz with their Bee Free Honee products. Originally discovered by accident, the vegan sweeteners made from apples have made their way into retail outlets across the country.

“Two years ago, we were in roughly 350 stores,” Elms confides. “Now we are in over 1,000 retail stores and are supported by several major online retailers, so our products are available worldwide.”

Back in 1999, Sanchez was attempting to make apple jelly, but forgot to add pectin. The former pastry chef bottled her creation anyway and discovered that the thick liquid tasted a lot like honey. Years later, when she heard about the decline in bee populations, she thought there might be a market for her sweetener as a replacement for honey, so she recreated the concoction. Working with AURI scientist Charan Wadhawan on product development, nutritional analysis, labeling and a shelf-life study, Sanchez refined the recipe and brought Bee Free Honee to market in 2010. Elms joined as business partner in 2013, bringing substantial sales and marketing expertise.

Bee Free Honee products are found in some of the nation's top natural and specialty foods markets, including Natural Grocers by Vitamin Cottage, Sprouts Farmers Markets, Fresh & Easy, Earth Fare,

Whole Foods Market and online at *Vitacost.com* and *Amazon.com*. Sanchez and Elms were awarded a Local Producer Loan Program loan from Whole Foods, which “has been absolutely vital to helping us grow in that space,” adds Elms.

Not only has the Bee Free Honee distribution grown, so has the product line, which now includes five flavors. In addition to the original, which most resembles traditional honey, there are varieties flavored with mint, ancho chile, chocolate and slippery elm. Made with ingredients from the slippery elm tree, this flavor has curative properties used by Native Americans to help soothe sore throats and calm upset stomachs.

Sanchez originally worked with a co-packer to produce the Bee Free Honees. They outgrew that setting and now share a facility. The duo hopes to continue growing their business not just for themselves, but for their community. They eventually would like to “pay it forward” by building an incubator to help support other small companies and to provide job opportunities for people with special needs.

“I have an autistic son, so I see how important it is for people with special needs to have jobs because it's an overlooked sector,” Sanchez says. “Autistic people have skill sets, and I would like to give them a place to thrive and succeed.”

## Generating Buzz

Being a part of the Academy Awards will get you noticed. It's certainly generated attention for Bee Free Honee.

“We were included in the Oscar swag bags in 2014, and that got us some valuable publicity,” Sanchez says. Because of that inclusion and due to their product uniqueness, Bee Free Honee has been featured on numerous television shows and media outlets including:

- “The Ellen DeGeneres Show”
- CNN
- NBC's “Today”
- ABC
- CBS
- Hallmark Channel's “Home and & Family” show, featured by the Supermarket Guru
- *Cosmopolitan* magazine

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