



PAGE 3



Dairy beds

PAGE 4



Bioplastic future

PAGE 6



Hearty granola



Turkey to Go

Savory sandwich travels from
State Fair to Target Field

PAGE 2



(Top left) AURI meat scientist Carissa Nath developed a savory turkey sandwich served in popular “to go” venues such as chef Tim Malloy’s food cart (on right) in downtown Minneapolis.

BY DAN LEMKE

One of the Minnesota State Fair’s favorite food vendors knew that to stay on top, you can’t rest on your tail feathers. So the “Turkey to Go” stand added a Giant Juicy sandwich, designed by AURI meat scientist Carissa Nath.

This summer, the turkey sandwich debuted at Target Field where Twins fans could grab a taste of turkey near home plate at 81 home games. The Minnesota Turkey Growers Association, owner of the “Turkey to Go” brand, licensed a food vendor at the ballpark to promote Minnesota turkeys and the farmers who raise the birds.

MTGA also licenses the brand to Chef Tim Malloy for two mobile food carts in downtown Minneapolis. Malloy, who has been cooking for 27 years, has operated the turkey food carts for the past three years, selling a couple hundred sandwiches a day to workers looking to grab a healthy, tasty lunch on the run.

“We get nice crowds every day,” Malloy says. The sandwich is “moist, tender, has good flavor — it’s a good product. People really like it.”

Malloy says he likes to be the first vendor out in the spring and the last to shut down in the fall — as late as mid November. If the turkey carts aren’t out, phone calls and emails start coming.

He uses social media, such as Facebook and Twitter, to announce daily where the mobile lunch will be, opening a new platform for connecting consumers to producers.

A sandwich is born

MTGA has operated a turkey stand at the State Fair since 1958 and its famous turkey drumstick has made it a “must stop” destination for thousands of visitors. But as fairgoers often want a taste for something different, MTGA sought AURI’s help several years ago to come up with a new recipe.

“We needed to change our cooking procedures to keep up with demand,” says Steve Olson, MTGA executive director. “We were deep frying whole birds and with that process and the room we had, we were maxed out.”

Olson enlisted Nath’s help to develop a turkey sandwich that could be a prime offering on the fair menu.

As with many formulations, developing a winning recipe involved more than a little trial and error. Nath estimates it took more than six months and a dozen attempts before the right seasoning mixture was developed. Because of turkey’s mild flavor, it easily takes on the taste of whatever ingredients are added.

Nath and AURI food scientist Charan Wadhawan worked on refining formulations that Nath would make in the AURI meat lab in Marshall, then take to Turkey Growers taste tests.

The resulting Giant Juicy Turkey Sandwich has been on the menu for the past three years and draws rave reviews from fairgoers. Some have even tried, unsuccessfully, to coax the “top secret recipe” from the Turkey Growers’ staff.

“It was fun and challenging, which is one of the exciting things about research and development,” Nath says. “It’s rewarding when you can help a client get a product they are happy with.”

Olson says the sandwich has helped MTGA realize a 25 percent increase in turkey consumption at the fair over the past three years. Serving sandwiches and drumsticks consumes more than 3,100 Minnesota-grown birds during the 12-day run.

“This gives us a chance to take a different type of product to consumers,” Olson says, “and to promote Minnesota’s turkey growers.” ■

AURI and Turkey to Go



Carissa Nath, AURI meat scientist, designed a juicy, seasoned turkey sandwich for the Minnesota Turkey Growers Association.

Idea to opportunity: Design a turkey sandwich to supplement the popular grilled turkey legs at MTGA’s Minnesota State Fair “Turkey to Go” stand.

Outcomes: The “Giant Juicy” sandwich is not only popular at the State Fair, it’s now served up at Target Field and downtown Minneapolis mobile food carts.

Resting on straw and pine

Researchers test wood and ag compost packs for dairy barn bedding

BY ASHLEY HARGUTH

Could a bed of tamarack and soybean straw promote a restful night sleep? Yes, if you're a dairy cow.

A recent AURI study analyzed compost packs of wood and ag biomass for dairy barn bedding. Conducted at the University of Minnesota, the study tested materials that looked most promising from a 2006 AURI review of potential ag products for livestock bedding.

University of Minnesota researcher Tom Halbach says there are environmental concerns over manure disposal from dairy barns. But bedding packs, designed to compost over time, can maintain manure inside a barn and promote animal health and comfort.

"The longer the cow is around, the more money it is to the farmer," Halbach says. Compared to concrete floors, "bedding packs decrease lameness from injury to legs and hooves."

After the packs are cleared from a dairy barn, they are typically spread over cropland as fertilizer.

Funded in part by Minnesota Corn Growers and Minnesota Soybean Growers associations, the study looked at the cost, availability, particle composition and dust created by each of the materials tested.

Norway, southern yellow, jack and white pine, tamarack, ash, soybean straw, corn cobs, poplar and anaerobically-digested manure solids were tested.

Halbach, a professor in the U of M soil, water and climate department, says some materials may be more effective in blends. So researchers also examined four mixes: tamarack with white and Norway pine, wheat and soybean straw, a corn cobs and soybean straw mix, and poplar with digested manure solids that some dairies produce. All of the materials performed well, except digested manure solids that "were simply too wet to work in this application," Halbach says.

"Tamarack wood was of particular interest," as the Minnesota Department of Natural Resources identifies it as an underutilized wood species, Halbach says. "This study found that it performs as well as current wood products, with a 5 to 15 percent cost savings."

Researchers looked at the physical characteristics of various materials and mixes including moisture content, particle size, water-holding capacity, bulk density and chemical composition of carbon, nitrogen, pH, potassium, phosphorus, ash and soluble salts. The carbon to nitrogen ratio affects the pack's compost rate, and its water-holding capacity helps the bedding

pack hold its shape and perform properly, Doering says.

Particle size is also important. While finer particles hold more moisture, they also create more dust, causing health problems for animals and farmers, Halbach says. "The key is to find a correct particle size and also work with a combination of sizes and shapes," as a mixture performs better than uniform particles.

A spreadsheet, created from research results, lists the characteristics and costs of various ag and wood bedding materials. "It's a nice tool for farmers to compare what they want to use, including cost and performance," says Jen Wagner-Lahr, AURI innovation director. Follow-up tests were conducted on four different farms using various mixes to collect performance data, which are also included in the report.

While the study looked at "value-added opportunities for wood and agricultural products, it was also based on economics," Doering says. A compost bedding pack's cost depends on the raw materials used, so the study tested widely-available, low-cost materials with good performance. Halbach says he hopes this research will save money in the dairy industry. ■

For more information on the study, visit AURI's web site, www.auri.org

AURI and Dairy Bedding



AURI scientist Al Doering assisted a U of M study of compost bedding packs, made from various ag and wood fibers, for dairy barns.

Idea to opportunity: Design a bedding that is not only better for animal health and comfort than concrete floors, but is also an eco-friendly way to dispose of manure as a soil amendment.

Outcomes: A report and spreadsheet for farmers that lists the characteristics and costs of various bedding materials.

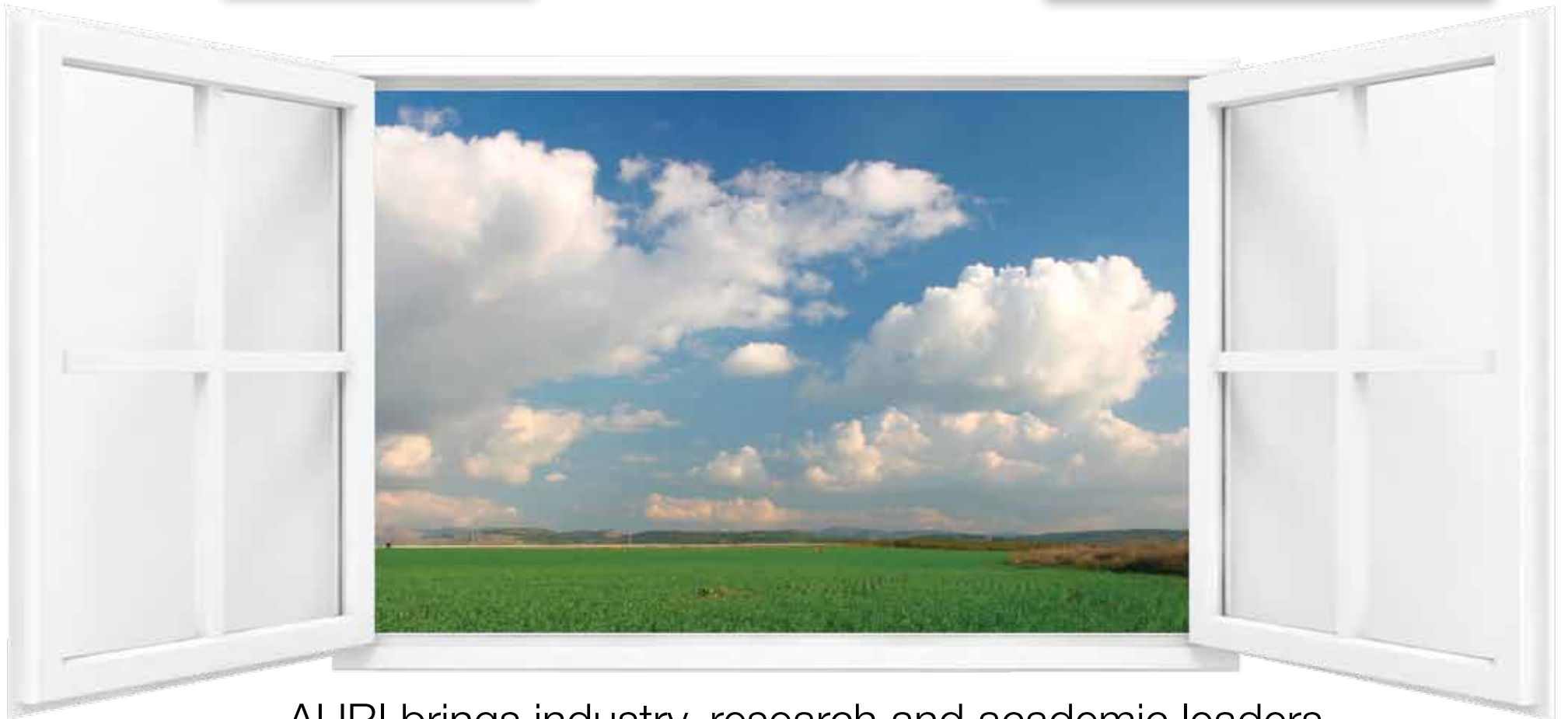
Funding partners: Minnesota Corn Growers Association and Minnesota Soybean Growers Association:

Biomass that is being tested for dairy bedding includes, from the left: soybean straw, ash and wood chips.

PHOTO BY ROLF HAGBERG
CARTOON BY UNCLE HYGGLY



A future made in bioplastics



AURI brings industry, research and academic leaders together to look at bioproduct manufacturing potential

BY CINDY GREEN

Gary Noble held up window trim made with wheat straw — just off a trial production run. The day before, he said, a retired extrusion expert working with him “comes running into my office and throws this on my desk. ... With this big grin on his face he says, ‘I did it, I told you I would.’ ”

The CEO of Bio-Plastic Solutions LLC, in Blooming Prairie, Minn., showed off his new product at AURI’s “Biobased Products: a Focus on Bioplastics” conference held August 17 in Mankato. Noble told participants that the window trim’s interior, made with wheat straw fiber and polymers “is basically two and a half times stronger than anything that we were up against” on the market.

A window manufacturer is looking at the biobased trim and, as Noble says, investors pay attention when “you’ve got somebody at the table who says ‘I’m interested; I’m ready to engage.’ ”

Meeting of the bio-minds

Noble, part of a four-member discussion panel, was among more than 80 attending the AURI bioproducts event that brought together representatives of agricultural and manufacturing industries, academia, government and economic development to discuss a recently-released AURI report. They looked at bioplastic manufacturing opportunities, challenges and a strategic plan for Minnesota.



Gary Noble’s company, Bio-Plastic Solutions in Blooming Prairie, Minn., has designed a window trim interior made of wheat straw fibers and polymers.

Bio-Plastic Solutions, a plastic components manufacturer, converted to cornstarch-based polylactic acid (PLA) eight years ago and is one of the first in the nation to use renewable polymers in plastic profile extrusion. The company makes BioBest® parts for doors, windows, wall trim, office furniture and medical devices that contain more than 80 percent biobased carbon.

“Our goal is to meet (the needs) of these customers who are asking for something new,” Noble says. “We’ve decided to stop using the word “alternative” and say we’re just going to create a product” that meets what “our customers are asking for.”

The conference, funded in part by Minnesota’s Soybean Growers and Corn Growers associations and Southern Minnesota Initiative Foundation, culminated almost two years of AURI’s comprehensive review of bioproducts. The initiative’s first phase was completed earlier this year with release of a Minnesota manufacturers’ survey and global market study by the Russell Herder Agency in Minneapolis. (see Ag Innovation News April-June 2011)

“One thing we find with biobased products is manufacturers are willing to use them,” says Dennis Timmerman, AURI project director. “But they ask the questions: does it perform well and is it cost effective?”

Almost two-thirds of manufacturers surveyed say they expect to use more bioproducts in the future, but 39 percent report being uninformed about biobased potential.

To follow-up on the study, “a group of industry thought leaders came together on May 4, heard a presentation on the report and came up with a list of priorities,” says Jen Wagner-Lahr, AURI innovation director. The top 10 recommendations were presented at the August 17 event where, after presentations, three small groups met to design action plans. “We’re trying to

be deliberate in getting this in the hands of people,” says Dan Lemke, AURI communications director, who moderated the event, “... to drive this and get the right people on the bus and get it going.”

Opportunities now

Bioproducts may take over markets in the future, but are there opportunities right now?

Yes, said panel member Doug Cameron, director of Alberti Advisors, which provides technical and financial consulting to green-industry companies. “Biobased chemicals in general are extremely hot these days,” he says. “For pretty much every polymer, there is effort to make them biobased.”

For example, companies are working on biobased polyethylene, nylon and PET plastic for beverage bottles.

“Coca Cola and Pepsi want to make them completely renewable.” Cameron, a chemical engineer and molecular biologist, worked in biobased research and development at Cargill, which owns NatureWorks LLC, makers of Ingeo biopolymer for products such as beverage bottles, mobile phone casings, food packaging, dinnerware, gift cards, even diapers. Ingeo is used by manufacturers worldwide.



“As a chemist, I get excited thinking about what brand new monomers could we come up with,” said panel member Dean Webster, a North Dakota State University polymer chemist. Monomers are small molecules that can be chemically bound to form polymers, and if they have “sets of properties that you can’t achieve with petrochemical-based materials, then you could create a market demand.”

In Minnesota, the “nearest-term” opportunities are in molded durable plastics for interior use, pressure-sensitive adhesives, foam and packaging, states the AURI report. Plastic bottles, however, are a challenge “because Minnesota doesn’t have a waste system that can process (compostable plastics) quickly,” says Carol Russell, CEO of Russell Herder Agency. Some biodegradable plastic bottles can’t be recycled with other plastics. It requires a different facility for handling it.”

Changing perception

“Manufacturers in Minnesota know there is opportunity,” Russell says. “They are getting calls from customers. The hurdle is they don’t know a lot about it. Will it work in their systems? Is it going to be expensive? They need to increase their awareness and understanding.”

“We in Minnesota need to be able to connect with all the companies to be able to explain why this product would be beneficial to them — because they are confused,” said panel member Jim Lunt, a biomaterials consultant and former Cargill chemist who has been involved in bioplastics development since the early 1990s.

“Many people do not know the properties of the materials that are available,” he says. “They ask, ‘can we convert this product to a biomaterial and be more sustainable?’ And they don’t know the answer, because they don’t know the performance of the products.”

“There is the perception that the quality isn’t as good — versus petro ... so it is important to increase awareness of

what the economic development opportunity here is and how it could become advantageous for many areas of Minnesota.”

Investors are often skeptical. “It can be very difficult for a start-up company in this sector to get the funding to do the research and the exploration to bring these products to market,” Russell says.

The challenge is to help the financial community “see why (bioproducts) would be good investments.” Increased access to capital “for developing sustainable products for new or existing markets,” needs to be explored, she says.

Connecting the dots

Noble says his company’s success evolved by tapping outside resources. “We’ve connected the dots through a variety of groups,” he says.

Years ago, AURI connected Noble to NDSU researchers that led to a network of resources such as the University of Minnesota, state universities in Winona and Mankato, Southern Minnesota Initiative Foundation, Jim Lunt and Minnesota manufacturers — including the window company that is interested in Bio-Plastic Solutions’ product.

“Once you get a few customers buying a product, trying a product, it spreads. It’s not something done behind a lot of closed doors. Everybody knows what (companies) are doing; they’re just waiting for someone to take that first step.”

Cameron agrees: “It’s really all about being very networked and having the manufacturers and producers and everybody talking.”

Proprietary information can pose a challenge to getting the word out,” Russell says. “There are a lot of confidentiality issues ... (manufacturers) don’t want to divulge what they’re doing. But innovation can move more quickly if there is more sharing.”

Academic and private institutions are both investigating bioproducts “but all the parties aren’t necessarily talking to each other,” she says.

A community of innovators

To nurture a bioproducts industry, “how do we form a concrete consortium that says: we have the right people to drive Minnesota companies to be a player in this field?” Lunt says. “How do we make it more formal than relying on some of us who know each other?”

The AURI report recommends building an “innovation community” — in effect a support group that brings together private and public people with a vested interest in bioplastics.

“It would be similar to what’s happening in renewables with the Roundtable,” Russell says, referring to regular working-group sessions coordinated by AURI. Representatives of business, academic and research institutions, ag groups and government meet to advance ideas on building Minnesota’s

renewable energy industry — now a national leader in biofuels.



Ingeo, a plant-based polymer fiber made by NatureWorks LLC, a subsidiary of Cargill, is used in diapers, beverage bottles, mobile phone casings, dinnerware and other products. (Photo courtesy of NatureWorks LLC.)

Following the bioproducts event, it became clear “there is a great need to connect the dots and continually so ... then action can take place,” Wagner-Lahr says.

An active roundtable would also “squarely put this opportunity on the radar of key decision makers and economic development people — that this needs further development and exploration,” Russell says.

Attracting manufacturing

A “slight weakness” with building a bioplastics industry here is “there is very little actual manufacturing of the plastics in Minnesota,” Cameron says. “We’ve got great research and development, start-up companies and universities. We’ve got people who are formulating and building and making things, but we don’t have the manufacturing.”

“We have the soybean and the crushing facilities. To complete the circle, we need the companies and the technology to be able to utilize and build biobased products here,” states Jim Palmer of the Minnesota Soybean Growers in the AURI report.

Co-locating raw material processing, testing and manufacturing to create a ‘biorefinery campus’ could help. “Minnesota is uniquely qualified to take on the opportunity of a growing biobased market ... there has already been a great deal of success in biofuels,” Russell says.

Ethanol could be the centerpiece for a biorefinery campus structured as a co-op, the bioproducts report states. “The campus could include incubators for start-up green chemical companies and manufacturing with biomaterials, such as using distillers grains as plastics strengtheners and waste glycerol from biodiesel production to make bioplastics.”

The “campus approach” can also be achieved “when business and economic development people are geographically linked,” Russell says. “It becomes a regional opportunity.”

Harold Stanislawski has been finding ways for the Fergus Falls Economic Improvement Commission, which he heads, to support local manufacturers’ conversion to renewable polymers. Shore Master of Fergus Falls, which makes boat docks and other marina products, is interested in incorporating biomaterials if they are competitive on price and performance. Vinylite, a windows and doors manufacturer in Fergus Falls, Minn., is developing a soy-based polyoil insulation for window frames.

More action than words

“AURI wants to build a network of individuals interested in biobased and get people together to hear what industry participants have to say,” Wagner-Lahr says. “In terms of technology, we want to know what they are interested in to deliver services tailored to their research needs.”

“AURI is not just trying to do research, but creating change through innovation. That’s exciting,” Russell says.

“They have a very clear process for how to take information and turn it into action: Do the research, gather the thought leaders, then put it into the field.”

AURI staff are reviewing results of the August 17 event “to identify action items and determine the most optimal routes for implementation,” including follow-up sessions for interested participants, Wagner-Lahr says.

“What does the future look like? It’s going to be dramatically different than right now,” Noble says. “We’re in the early stages so everything is changing. ... What it looks like is dependent on those who are out there who want to try something. It’s wide open.” ■



North Branch entrepreneur goes up against food industry goliaths

PHOTOS BY ROLF HAGBERG

BY LIZ MORRISON

North Branch, Minn. — Persistence, dedication to quality and a personal approach to marketing: these values are helping a Minnesota entrepreneur build a national market for premium granola bars.

Olympia Granola makes hearty 3-ounce granola bars in flavors like lemon chamomile, mocha mint, green tea zest and honey almond. The five-year-old company is owned by North Branch, Minn., food industry veteran Bill Forsman. This fall, Forsman expanded his product line, adding a new granola bar that tastes like the campfire classic “s’more,” plus three new 1.25-ounce snack bars.

Olympia Granola bars are made from high-quality ingredients, including rolled oats from the Red River Valley, sunflower seeds from Crookston, honey from the St. Croix Valley, almonds, coconut, crispy rice bran and sea salt.

The bars are a good source of protein and fiber, and have no dairy, wheat or trans fats. A transparent wrapper reveals the simple ingredients, which are gently rolled together for an appealing texture — not hard and dry, not pasty or gummy. “They taste like something your grandma makes,” Forsman says.

The bars, which sell for around \$3, are aimed at health-conscious consumers who read food labels and want “a natural product that’s a good source of protein and energy,” Forsman says. Olympia Granola customers “value the hand-crafting we do and are willing to pay a premium for a premium product.”

“The bars are delicious,” says AURI food scientist Charan Wadhawan, who helped Olympia Granola develop and test recipes. “Very nutty and tasty.” Although they are fairly high in calories — about 350 calories

and
20
grams of
fat per bar —
“the calories are
from good, nutritious
ingredients,” Wadhawan says.
“It’s wholesome nutrition.”

Food industry veteran

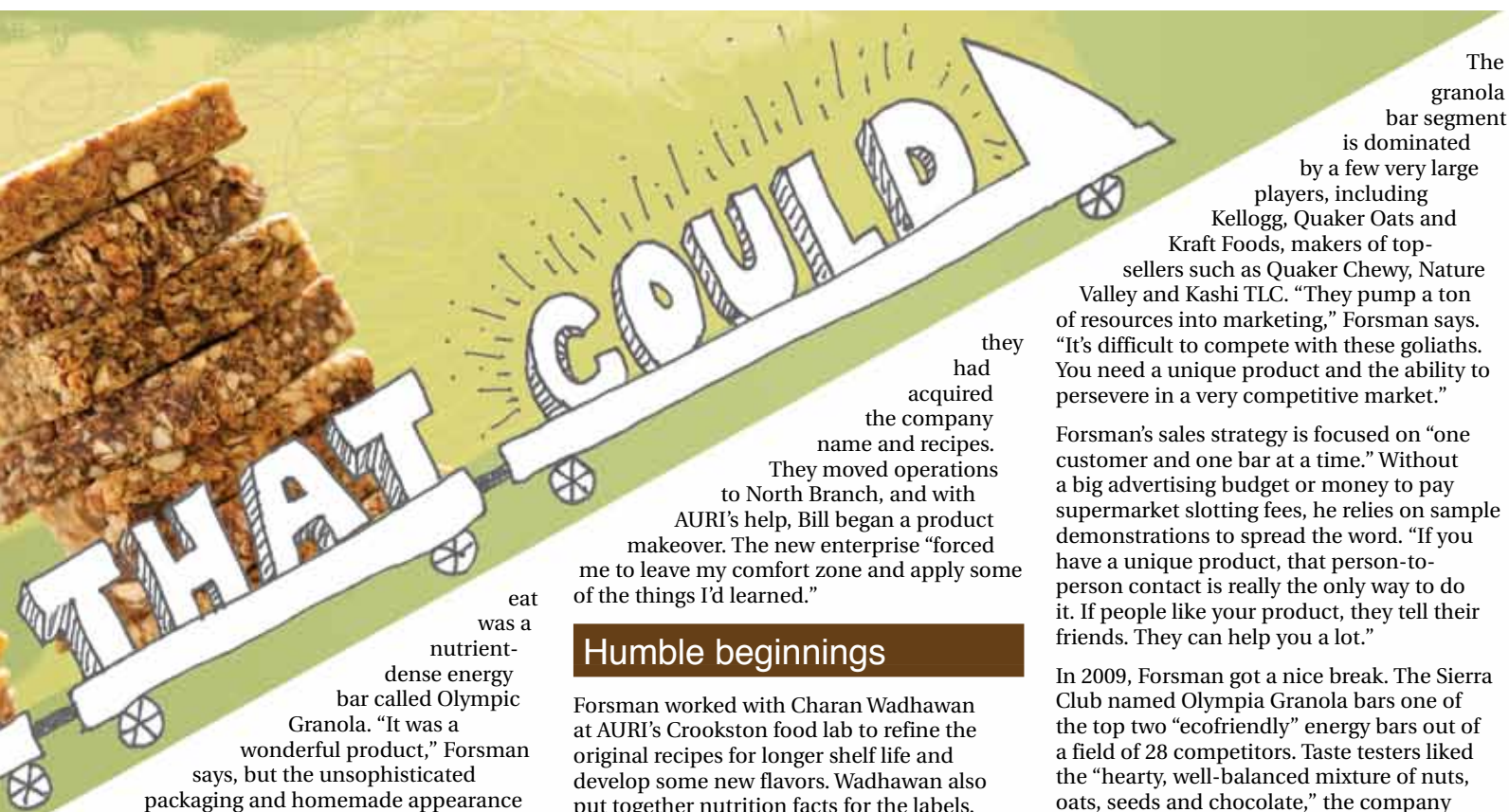
Forsman, a Minnesota native, has more than 20 years of food processing and marketing experience. He helped Crystal Farms expand its cheese and dairy product distribution. Later, he worked on retail product launches for Lloyd’s Barbeque, the first company to offer fully-cooked meat products at supermarket meat counters.

“That’s where I got my education on value-added food products,” says Forsman, who has a business degree from St. Cloud State University. His experiences in the food industry also taught him the importance of having “quality ingredients and a unique product.”

In 2007, Forsman was casting around for a new business opportunity. Early one morning, he was sitting in a restaurant before a business meeting. “I was thinking, wouldn’t it be neat if my next venture could be something my whole family enjoyed.”

Forsman and his wife, Sandra, have seven children, ages 7 to 23. They lead an active lifestyle — both Sandra and Bill are longtime runners, and Sandra and the older kids do marathons and triathlons. The family was already working together on a little cottage business making granola cereal.

One of the Forsmans’ daughters had battled anorexia. Among the few foods she would



eat was a nutrient-dense energy bar called Olympic Granola. "It was a wonderful product," Forsman says, but the unsophisticated packaging and homemade appearance

they had acquired the company name and recipes. They moved operations to North Branch, and with AURI's help, Bill began a product makeover. The new enterprise "forced me to leave my comfort zone and apply some of the things I'd learned."

Humble beginnings

Forsman worked with Charan Wadhawan at AURI's Crookston food lab to refine the original recipes for longer shelf life and develop some new flavors. Wadhawan also put together nutrition facts for the labels. "Charan was wonderful to work with," Forsman says. "No way could a small business like ours afford to develop and test a new food product without assistance."

Forsman started out manufacturing the granola bars — still called Olympic Granola — in the commercial kitchen of a local church. Later, with an SBA loan, he bought a vacant Frito-Lay facility in North Branch and converted it to a granola bar factory.

At first, most of the processing and packaging was done manually — mainly with family labor. As sales grew, Forsman automated and now manufactures private label products in addition to his own brand. He employs a combination of full-time, part-time and temporary workers, and family members still help out occasionally.

Early on, Forsman suffered an expensive setback. Just as he was gaining some brand recognition, "we were notified by the U.S. Olympic Committee that they own the word 'Olympic' and we needed to 'cease and desist' using the word. ... All our labels, packaging, sales materials, website — everything had to be changed." The company became Olympia Granola, and Forsman resumed the painstaking task of building a brand from scratch.

Dominated by giants

The overall granola bar market reached \$910 million sales in 2009, according to Specialty Food Magazine. But sales volume has been flat since 2007, as cereal and snack bars lost ground to competing snack foods, such as trail mix and yogurt. Successful new products in this category emphasize health benefits, fiber, all-natural ingredients and variety in flavor and taste, the magazine reports.

That trend is "very positive for us," Forsman says. "You can see and read what's in our bars. They look great, read great, and taste even better." Consumer surveys consistently show that "taste is the number one criteria for picking food," Wadhawan adds.

The granola bar segment is dominated by a few very large players, including Kellogg, Quaker Oats and Kraft Foods, makers of top-sellers such as Quaker Chewy, Nature Valley and Kashi TLC. "They pump a ton of resources into marketing," Forsman says. "It's difficult to compete with these goliaths. You need a unique product and the ability to persevere in a very competitive market."

Forsman's sales strategy is focused on "one customer and one bar at a time." Without a big advertising budget or money to pay supermarket slotting fees, he relies on sample demonstrations to spread the word. "If you have a unique product, that person-to-person contact is really the only way to do it. If people like your product, they tell their friends. They can help you a lot."

In 2009, Forsman got a nice break. The Sierra Club named Olympia Granola bars one of the top two "ecofriendly" energy bars out of a field of 28 competitors. Taste testers liked the "hearty, well-balanced mixture of nuts, oats, seeds and chocolate," the company stated. A Sierra Club spokeswoman, delivering the news, told Forsman: "Your small family business has arrived!"

The national exposure boosted orders. Forsman doesn't disclose his company's sales or volume, but five years after launching, Olympia Granola bars are now distributed in all 50 states, he says. Most sales come from the East and West coasts. Primary retail outlets are natural foods stores and co-ops, coffee houses and health clubs. Fans, who weigh in on the company's Facebook page, include "everyone from soccer moms who want a nutritious snack for the kids, to athletes, to hikers and backpackers who want a meal on the go."

Forsman works with several wholesale food distributors and ships directly to retail vendors. Consumers can buy granola bars direct from the company's website.

Lessons in humility

Marketing a new food product is not for the faint-hearted, Forsman says. "The food business is one of the most competitive industries around. And low margins mean you have to sell a lot of product. Anybody in the food industry gets a lesson in humility."

What keeps him going, Forsman says, is "a passion for our product line," and the chance "to change lives." ■



Trail Bars

- Honey Almond
- Almond Chocolate
- Chocolate Peanut
- Almond Chocolate Chip
- Java Chocolate



Coffeehouse Bars

- Espresso Almond Chocolate
- Mocha Mint
- Green Tea Zest
- Turtle Mocha

Sunshine Bars

- Lemon Chamomile

New Products

- S'more Bars
- Snack Size Trail Bars

To purchase Olympia Granola bars, go to www.olympiagranola.com



Long-time food entrepreneur Bill Forsman brought a granola bar brand from the Pacific Northwest to Minnesota, added local ingredients such as Red River Valley oats, Crookston sunflower seeds and St. Croix Valley honey, and now distributes 11 varieties across the country.

made him curious about the company's story. He saved a label, stashing it in his briefcase. Pondering his future that morning in the restaurant, he recalled the energy bars that had helped his daughter and pulled out the package.

When he checked out the company on-line, he discovered that the mom-and-pop business had shut down because of family issues. On an inspiration, he called from the restaurant, not realizing he was calling the Olympic Peninsula in Washington state. "It was 5:30 in the morning there, and I got them out of bed!"

The Forsmans flew out to Seattle to meet the creators of Olympic Granola, and before long,

AURI and Olympia Granola



Charan Wadhawan, AURI food scientist, helped redesign and test recipes for all-natural granola bars high in fiber and protein.

Idea to opportunity: Food entrepreneur purchased a granola bar recipe and brand name from a shuttered Washington state company and decided to upgrade and market the bar.

Outcomes: Minnesota-made Olympia Granola bars are now sold in every U.S. state.

BY DAN LEMKE

Crookston, Minn. — It's almost always about the numbers.

An AURI initiative will help poultry producers and others decide if converting some heating systems to biomass power makes economic sense.

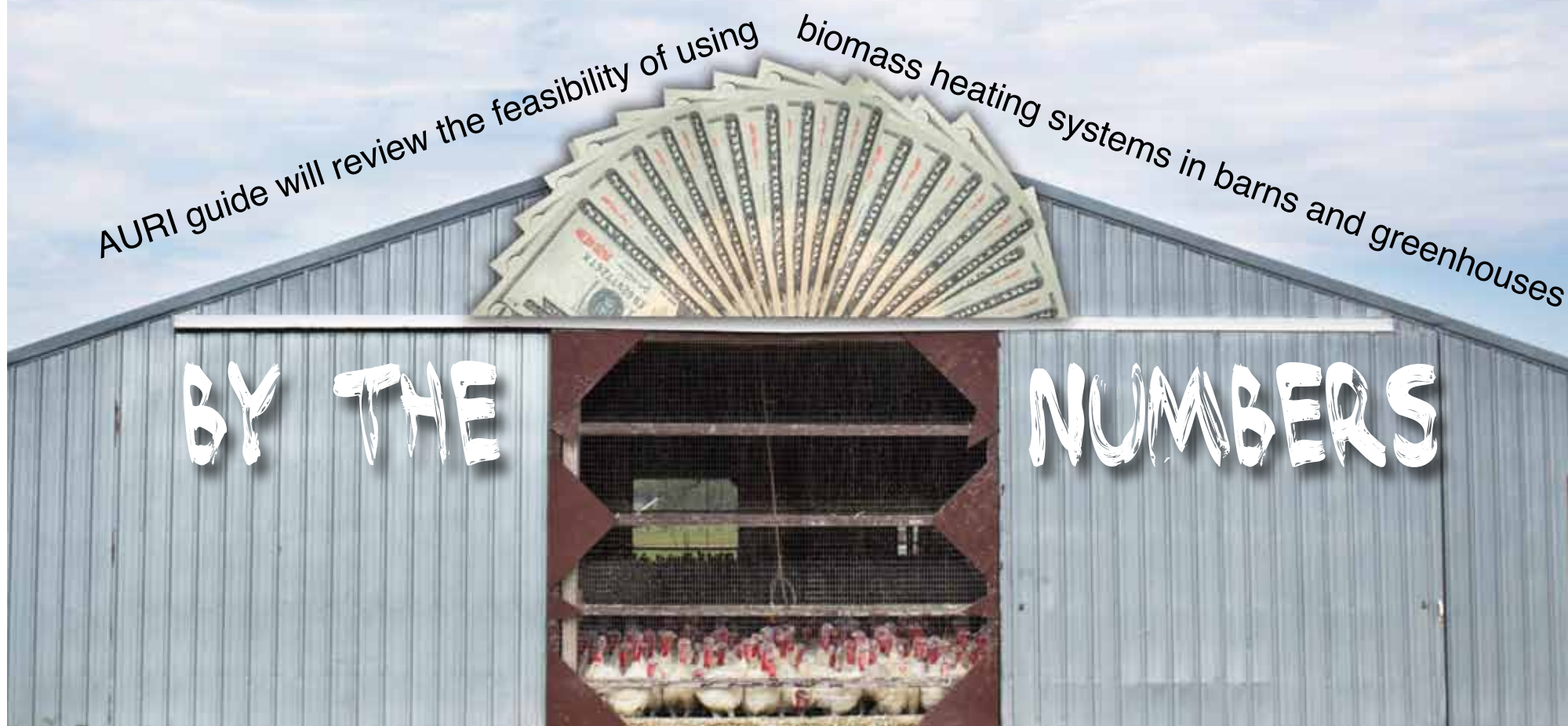
The Minnesota Biomass Combustion Heating Feasibility Guide, developed by the initiative, will review the technical and economic feasibility "of converting propane and fuel oil systems to biomass," says Randy Hilliard, AURI project director.

Hilliard and AURI scientist Al Doering will study the economics of installing half-million, one-million and five-million Btu-per-hour biomass systems for light industrial operations such as turkey barns. They will identify burner manufacturers, the costs of installation, operation and biomass feedstocks, and the estimated return on investment.

"We have received substantial interest from turkey producers, greenhouses and others who are interested in converting their current systems to biomass," says Doering, head of AURI's coproduct laboratory in Waseca. "In order to make that decision, they need to know how it will work from an economic perspective."

Biomass may have a difficult time competing with low-cost fuels such as natural gas. But up against higher-cost propane and fuel oil, "the economics could make some sense," Hilliard says.

Beside economics, Hilliard says the initiative will look at all potential benefits of biomass heat, including animal health. It is expected to be completed and available this winter. ■



FAIR FOOD

BY DAN LEMKE

Not all Minnesota State Fair food came deep-fried, skewered on a stick this year. Some was farm fresh, healthy and even gourmet.

Minnesota Cooks, a full-day showcase of foods made with Minnesota-grown ingredients by premier Minnesota chefs, made its ninth state fair appearance on August 28.

"Buying local and making the connection between where your food comes and what you put on the table is becoming more important to people these days," said Doug Peterson, Minnesota Farmers Union President. "Minnesota Cooks is the perfect way to celebrate the great food produced in Minnesota."

The program included six 45-minute demonstrations by chefs from throughout Minnesota demonstrating their award-winning recipes, and a panel of local celebrity tasters and farmers who grew the ingredients.

"This is an opportunity to reach out and educate consumers while working to create market opportunities for Minnesota food producers," says Dennis Timmerman, AURI project director.

Minnesota Cooks was designed by the Minnesota Farmers Union with sponsorship support from AURI and the Minnesota Department of Agriculture. ■

(Left) Hundreds of state fairgoers crowded the Minnesota Cooks event to connect with local food and the farmers who grow their produce. (Right) Culinary students from Cordon Bleu served samples of wild rice meatloaf, one of more than a dozen dishes featured in local food demonstrations.



PHOTOS BY DAN LEMKE

Proactively seeking

Solutions



BY JENNIFER WAGNER-LAHR
AURI Senior Director of Innovation

AURI has a long, successful history of working with Minnesota entrepreneurs, businesses, agri-processors and others to help develop innovative ag-based products and processes. We help move ideas to implementation — be it a new product on the market or a process that increases manufacturing efficiency. The assistance we provide is proprietary. Trade secrets, formulations and private information are not shared with anyone.

Equally important are AURI's industry-wide initiatives. These collaborative projects examine emerging trends, address industry needs and move public domain information into the hands of people who can use it.

Collaborative origins

Each year, AURI staff meet with dozens of Minnesota agricultural organizations, commodity groups, economic developers, industry leaders and others to determine their priority issues for the coming year. When those issues fit AURI's mission, our project development and scientific staff create initiative projects to help address those issues. All initiatives must meet two criteria: their results are available to the public, and they are tied to industry needs.

These initiatives answer broad challenges plaguing an industry. They investigate new technologies and help identify emerging trends and opportunities. For example, this issue of Ag Innovation News features a few of our initiatives such as compost bedding packs for dairy barns (page 3) and a biomass heat feasibility guide (page 8).

These initiatives “see around corners” — to proactively identify innovative opportunities for Minnesota agriculture. They identify real life examples of what can be successful, show that there is science behind the findings and provide a tool for farmers, entrepreneurs or businesses to use and consider applying in their own circumstances.

A rigorous process

AURI project and technical staff recently completed the process of identifying and selecting initiatives we will be working on in 2012. We pared a long list down to about two dozen projects — ranging from food industry concerns to new technologies for ag-based biogas production to alternative uses for grains.

There is no shortage of ideas or needs. However, AURI has limited staff and resources, prompting us to work diligently to weigh the needs and prioritize our resources. We would love to be able to do them all, but we focus on what makes the most sense and will most effectively meet industry needs. ■



AURI leaders attend President Obama's town hall meeting



Cannon Falls, Minn.. — Rural Minnesota may be a long way from Washington D.C., but its contributions are being recognized in the nation's capitol.

When U.S. President Barack Obama held a town hall meeting in Cannon Falls in August, kicking off a Midwest tour, the central message was strengthening rural America's economic health.

AURI's Teresa Spaeth, executive director, and Kate Paris, planning and project director, were invited as guests of U.S. Representative Tim Walz, who represents Minnesota's 1st Congressional District.

The president emphasized that his vision for rural economic development includes renewable energy and other ag-based ventures. “If you help the farm economy in rural communities, you help the economy of the entire state,” Obama told the crowd of 500. “And if you help entire states, then that's good for the country as a whole.”

“It is heartening to hear the president recognize farming and innovative agriculture for their contributions to creating wealth in rural America,” Spaeth said. “That certainly supports the message AURI has been carrying for years.”

The crowd also heard from U.S. Secretary of Agriculture Tom Vilsack, who chairs a newly-formed White House Rural Council. The Council will coordinate programs across government to encourage public-private partnerships to promote economic development in rural communities nationwide.

The Rural Council will also be responsible for providing recommendations for investment in rural areas. It will engage with a variety of rural stakeholders, including agricultural organizations, small businesses, and state, local and tribal governments. ■



PHOTO BY KATE PARIS

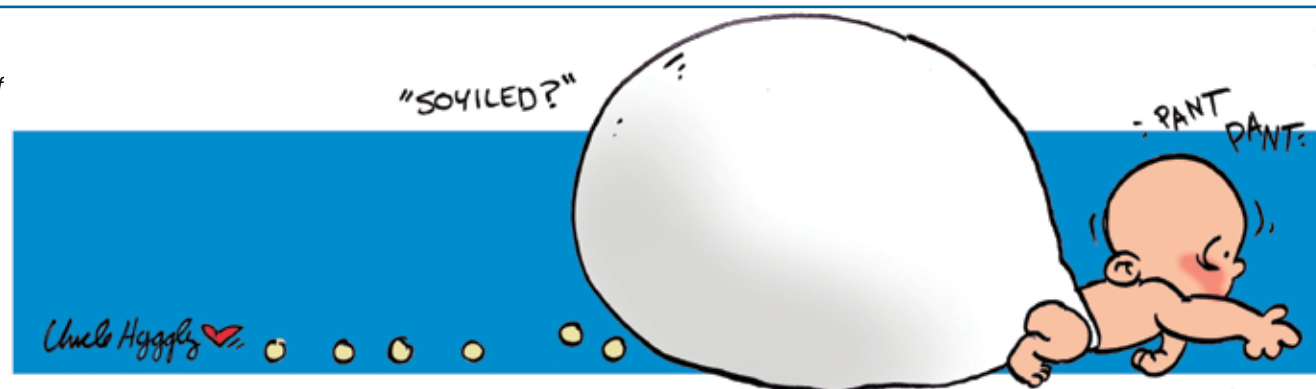
President Barack Obama addresses the importance of rural development to our nation's economy at a townhall meeting in Cannon Falls, Minn.

ELSEWHERE IN AG INNOVATIONS

BY DAN LEMKE

CARTOONS BY UNCLE HYGGLY

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. Please note that ARS is the USDA's research division.



Dandy diapers

Soymeal-based absorbents could make diapers more eco-friendly. Diapers use hydrogels, or superabsorbent polymers (SAPs), that absorb hundreds of times their weight in liquid. Scientists at Battelle, an independent research organization headquartered in Columbus, Ohio, have converted soybean meal into SAPs. They could replace all or part of the acrylic-based absorbents in diapers.

From: Soyatech.com
July 27, 2011

Ethanol sunrise?

Desert plants used to make tequila could produce a next-generation biofuel. The agave plant, which grows in marginal or desert lands, produces a sugary nectar that is used in cooking and tequila distillation. It could also be used to produce ethanol in areas with little arable land, according to Oxford University researchers.

From: Soyatech.com
July 28, 2011

Flipping their lid

Food giant Nestle is making the first-ever polyethylene milk jug caps derived entirely from sugar cane. Two dairy brands that the company markets in Brazil will use the bio-tops. Nestle teamed up with packaging company Tetra Pak to roll out the caps in August.

From: foodproductiondaily.com
August 1, 2011



Blueberry bones

A blueberry compound may help form strong, healthy bones. Arkansas Children's Nutrition Center researchers in Little Rock found that polyphenols, which give blueberries their blue, purple and red color, could aid bone development.

Laboratory rats fed rations with 10 percent freeze-dried blueberry powder had significantly more bone mass than those fed blueberry-free rations. The work paves the way for research to determine if blueberries could boost bone-mass development in humans and possibly help prevent osteoporosis.

From: USDA-ARS
June 21, 2011



Broccoli takes aim

Broccoli apparently has cancer cells squarely in its crosshairs. Oregon State University scientists have discovered that chemicals in certain vegetables selectively target and kill cancer cells while leaving normal cells healthy and unaffected.

The tissue of cruciferous vegetables, such as broccoli, cauliflower and cabbage, contain high levels of glucosinates, which are metabolized by the body into chemicals found to be powerful anti-cancer agents.

From: Nutraingredients.com
June 15, 2011

Onion power

Waste from industrially-processed onions could potentially be used as food ingredients. Autonomous University researchers in Madrid, Spain found the brown skin, top and bottom of an onion are rich in dietary fiber and antioxidants.

From: Foodnavigator.com
July 18, 2011

Corn, soy battle hunger

Instant Corn Soy Blend, a nutritious, shelf-stable meal supplement, has been developed for emergency food aid by USDA-ARS scientists. The blend is cooked, extruded and milled into a powder, then reconstituted with potable water into porridge. It contains vitamins and minerals that young children, in particular, need to stay healthy.

From: USDA-ARS
August 4, 2011

Packed in plants

Canadian packaging developer Pakit and PepsiCo are working together to make molded packaging from plant materials. Recyclable and biodegradable food packaging, such as trays and clamshells, will be made from plant cellulose fibers.

From: Foodproductiondaily.com
August 1, 2011

Sugar plastic from Brazil

A large-scale bioplastics plant is being built in Brazil by Dow Chemical Company and Mitsui & Company of Japan. The companies' \$200 million joint venture will produce biopolymers from sugarcane-derived ethanol.

From: Kyodo News International, Inc
July 20, 2011

More energy with less

Biodiesel's energy balance may be better than first believed. Newly-published research from the University of Idaho and USDA shows that for every unit of fossil energy needed to produce biodiesel, the return is 5.54 units of renewable energy. Made primarily from U.S. soybean oil, biodiesel only showed a 3.2 to 1 energy balance in 1998, which increased to 4.56 to 1 in 2009. The research credits increases in processing efficiency, energy-saving farming practices and soybean yields for the improvement.

From: Soyatech.com
July 28, 2011



Teaming up for innovation

BY TERESA SPAETH
AURI EXECUTIVE DIRECTOR

Watching my son play baseball is one of my favorite summer evening pastimes. Each player has a certain skill set. To win, coaches have to position players in the right place to maximize their skills for the collective good.

The cool thing is it doesn't matter who they are, or where they are from, as long as their abilities are best utilized.

The banker's son plays outfield and the school janitor's son plays third base. The son of the obstetrician, who likely delivered most of the boys, plays shortstop. Despite their various backgrounds and skills, they all learn to play together, strategize, celebrate the good and pull together in tough times. While watching a game, I thought about how similar this is to rural innovations.

AURI's mission is to help develop uses for Minnesota's agricultural products that create economic benefit for producers, ag processors and rural communities. AURI has a unique set of skills and resources that help businesses, processors and entrepreneurs move agricultural innovations from idea to reality.

Like a baseball squad, AURI has resources to cover the bases, but we enlist outside help to complete the team. Whether helping develop an ag-based product — like we do hundreds of times a year — or trying to grow an industry with renewable energy and biobased product support, AURI tries to get the right players into the game. This means bringing economic developers, university researchers, industry experts and other collaborators into the team to maximize chances for success. By tapping into the strengths of available resources, we put everyone in the best position to win. ■

AURI AG QUIZ

- What biobased product sector is gaining momentum in Minnesota?**
 - Bioplastics
 - Biomonthly products
 - Bionic parts
- About how many turkeys are consumed annually at the Turkey To Go stand at the Minnesota State Fair?**
 - 500
 - 1,500
 - 3,100
- With Pet Care Systems' expansion, how many bushels of wheat will the litter manufacturer process per month?**
 - 55,000
 - 100,000
 - 450,000
- What typically happens to used compost bedding packs from dairy barns?**
 - Burned for fuel
 - Taken to a landfill
 - Spread on farm fields as fertilizer
- Who named Olympia Granola one of the most eco-friendly products?**
 - Sierra Mist
 - Sierra Club
 - Boone & Crockett
- What fuel source is being considered to heat greenhouses and barns?**
 - Biomass
 - Oil sands
 - Isobutynol
- What State Fair event helps connect consumers with chefs and the farmers who produce their ingredients?**
 - Eating Good in the Neighborhood
 - Eating Local
 - Minnesota Cooks
- What are AURI projects called that benefit an entire industry?**
 - Initiatives
 - Invitations
 - Enterprises
- What is the name of the turkey sandwich developed by an AURI scientist for Minnesota Turkey Growers?**
 - Juicy Lucy
 - The Linus and Lucy
 - The Giant Juicy

ANSWERS: 1.a 2.c 3.b 4.c 5.b 6.a 7.c 8.a 9.c

About how many turkeys are consumed annually at the Turkey To Go stand at the Minnesota State Fair?



SERVICES

A nonprofit corporation created to strengthen rural Minnesota's economy, AURI helps businesses respond to market opportunities with new and value-added uses for agricultural goods. The Institute builds working partnerships with business innovators, agricultural groups and researchers, and provides technical support to clients conducting new product research and development.



AURI programs are available to legally-organized businesses or cooperatives with projects that have the potential to create new uses or new markets for Minnesota agricultural commodities. AURI assistance is designed for the early stages of a product's life cycle, while an element of feasibility is yet to be determined.

Project proposals are evaluated on the following criteria:

- Innovation/uniqueness
- Market viability
- Use of Minnesota commodities
- Number of farmer-producers impacted
- Amount of value added from further processing
- Economic impact
- Cost savings

Programs are designed to assist with:

- Identifying emerging value-added opportunities
- Developing innovative commodity-based products
- Developing production processes for feasible products
- Promoting products developed with AURI technical assistance
- Providing resources to bring new products and processes to the marketplace

Assistance may include:

- Access to AURI's scientific and business staff
- Access to laboratory and pilot plant facilities
- Product development and feasibility testing
- Process evaluation and improvement
- Technology transfer and applied research
- Business needs evaluation
- Links to available resources
- Cost share assistance for technical services

AURI provides resources proportionate to the project's impact. Smaller-impact projects may be eligible for technical assistance only, while projects with industry-wide impact may be eligible for cost-share assistance.

AURI Facilities

AURI operates several laboratories:

- Coproducts Utilization Laboratory and Pilot Plant, Waseca
- Fats and Oils Laboratory, Marshall
- Meat Laboratory, Marshall
- Product Development Lab, Crookston
- Fermentation and Chemistry Lab, Crookston

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A **SWHEAT** EXPANSION

BY DAN LEMKE

Detroit Lakes, Minn. — Minnesota's most unique pet litter producer is expanding its Detroit Lakes operation, creating additional space and jobs.

Farmers Union Industries says it is pouring \$4.25 million into its Pet Care Systems facility where Swheat Scoop cat litter is produced. Swheat Scoop is made from naturally-processed secondary wheat, which is not typically used for food. Beside cat litter, Pet Care Systems also manufactures litter for horses and small animals.

"This is an investment in our employees, the community of Detroit Lakes and agriculture," says Don Davis, Farmers Union

Industries president and CEO. The company first invested in Pet Care Systems in 2002 and later assumed full ownership.

In August, construction started on the facility's expansion that includes 21,000 square feet of warehousing for inventory and logistics. The investment will double production capacity from about 55,000 bushels to 100,000 bushels of wheat per month to make litter.

Farmers Union Industries expects to add five jobs at the facility and possibly more as production and sales grow. Currently Pet Care Systems employs 26 people in Detroit Lakes and a national sales force of eight.

AURI has worked with Pet Care Systems since the 1990s and

named the company "Ag Innovator of the Year" in 2002 — the first year the award was given. "Pet Care Systems continues to grow and provide jobs and add value to agriculture," says AURI scientist Alan Doering who helped test and develop several product formulations in the Waseca coproduct utilization lab. The company "is a shining example of innovative, value-added agriculture and ... how AURI can assist Minnesota companies."

Established in 1994 by Mike, Vonnie and Mark Hughes, Pet Care Systems developed wheat-based litter that is scoopable, flushable and reduces odor — as an alternative to clay-based litters. Today Swheat Scoop is available in thousands of stores nationwide including Target, Petco, PetSmart, several major grocery chains, specialty shops and other pet stores. ■