



# AG INNOVATION NEWS<sup>®</sup>

The newspaper of the Agricultural Utilization Research Institute

## POWER DELIVERED

Biodiesel tested in utility-pole preservatives  
page 3

**IN THIS  
ISSUE:**



Clean energy  
from Sweden  
page 2



Dairy on the  
moove  
pages 4-5



Innovative science  
pages 6-8

RENEWABLE ENERGY  
**SWEDISH  
STYLE**

Observations  
of former  
ambassador to  
Sweden leads  
to renewable-  
energy institute  
at Mankato  
university



The newly-formed International Renewable Energy Technology Institute of Minnesota headed by former MSU-Mankato dean John Frey, will test renewable energy technologies, including Swedish systems.

technologies. Establishing a relationship could lead to increased manufacturing, job creation and increased energy independence in the U.S., he said. MSU-Mankato agreed and, in partnership with the Biobusiness Alliance of Minnesota, established the institute to move innovative technologies to commercialization.

“We want to assist Minnesota in becoming a state that is driven by the clean-energy economy.” John Frey

BY DAN LEMKE

*Mankato, Minn.* — An effort to bring Swedish clean-energy technology to the United States has led to a Minnesota State University-Mankato research facility intended to boost Minnesota’s renewable-energy industry.

The newly-formed International Renewable Energy Technology Institute of Minnesota intends to accelerate the implementation of renewable-energy technologies, encourage entrepreneurship and facilitate the exchange of ideas and technology.

“It came about when the ambassador to Sweden (in 2006) recognized there was clean-energy technology that the United States didn’t have,” says John Frey, IRETI interim director. Frey retired as MSU-Mankato’s College of Science, Technology and Engineering dean in 2008 and now heads the institute.

Ambassador Michael Wood recognized that the United States could benefit from some of Sweden’s innovative

In 2009, MSU-Mankato received state funding to establish a certified center with three goals: serve as a third-party validating test center, provide research, development and prototyping services, and train individuals for the new renewable-energy market. IRETI will test efficiency and emissions for solid combustible fuel, cellulosic biofuel and biogas production systems, and eventually small wind and solar energy systems.

“This isn’t solely an MSU-Mankato project, it’s a Minnesota project,” Frey says.

IRETI is initially focusing on residential heating technologies that use solid biomass fuels. Specialized equipment measures things like heating efficiency, emissions and the amount of radiant heat escaping from the biomass stove. Add that capacity to an already strong automotive technology department at Minnesota State and Frey says a large portion of the nation’s energy needs are being addressed.

“About 35 percent of our nation’s energy consumption comes from residential usage and 27 percent from transportation. So combined, these two areas address about 62 percent of our nation’s energy needs,” Frey says. “Our intent is to be looking at both production and consumption.”

IRETI has an anaerobic digester gas optimizer that assesses the gas output of various feedstocks — information that scientist Al Doering says can be very useful to AURI and its clients. Doering heads AURI’s coproducts laboratory in Waseca and is serving on the IRETI advisory board.

“AURI can do many things, but we don’t have the capacity to test equipment or emissions,” Doering says.

“AURI is supporting IRETI whenever there is an opportunity for value-added agriculture,” Doering says. “Before you can move research to the applied stage, there is a lot of basic research that needs to be done.” ■

MSU-Mankato staff set up equipment to test renewable-energy technologies including residential heating systems using solid biomass fuels.



# BIO ROT STOPPER

AURI-supported tests evaluate biodiesel in wood-preservative carrier for utility poles



Wood preservatives help utility poles weather the elements for up to 80 years. AURI is sponsoring tests of biodiesel carriers, which help preservatives stick to poles without the odor of petroleum carriers. A Minnesota pole manufacturer is already using biodiesel carriers — one of the largest nonfuel uses for biodiesel in the state.



PHOTOS BY ROLF HAGBERG

BY DAN LEMKE

*Minneapolis, Minn.* — Standing for years against the constant barrage of wind, rain, ice and snow, utility poles are hardly noticed unless they fail due to storms or rot. For millions of Americans, the simple wooden pole is a reminder that their electrical power and important phone calls will be delivered.

Now soybeans may play a larger role in ensuring utility poles stand their vigil for decades.

To make a log into a utility pole that can survive the elements for as many as 80 years requires wood preservatives. Typically, the preservative DT-40 is delivered to wood using a liquid carrier made from off-stream petroleum products with strong odors. The carriers help the preservative stick to the poles.



Odor complaints prompted one Minnesota lumber company to use a 20-percent biodiesel blend (B20) carrier to reduce odors. For the past several years, the company has used significant amounts of biodiesel — one of the biggest nonfuel uses in the state — and substantially reduced odor emissions. However, wood preservative trade association members have challenged the use of biodiesel as a treatment carrier.

AURI and the Minnesota Soybean Research and Promotion Council are supporting a year-long research project on using biodiesel as a carrier agent. Positive results could help support current biodiesel use and trigger new markets.

“This is a substantial opportunity to open a good, additional market for biodiesel beyond conventional transportation uses,” says Dennis Timmerman, AURI project director.

Fuel consultant Hoon Ge of MEG Corp is conducting the research, which started in August, and will evaluate the rates of biodiesel leaching from wood and wood decay. He will also test underlying soils and biodiesel blends of 20, 30, 40 and 50 to find the optimal inclusion rate.

“Every indication is that there is no problem with using biodiesel,” Ge says. “But we need to make sure that people get the right information and not myths because the potential for using biodiesel in this application is tremendous.”

If adopted throughout the wood preservative industry, biodiesel’s use could swell by millions of gallons, impacting the price of soybeans.

“Some estimates have shown that biodiesel supports the price of soybeans by as much as three dollars per bushel,” Timmerman says. “Biodiesel supporters and soybean producers are understandably excited about this opportunity.”

Tests results should be complete in the fall 2011. ■



# WHEY

## more dairy products AURI-sponsored research is finding new uses for dairy ingredients

BY LIZ MORRISON

AURI is looking for “whey” more uses for cheese-processing leftovers.

Researchers are investigating novel ways to use whey in high-protein drinks, develop nonfat dry milk “crunchies” for energy bars and add natural agents to shredded cheese to deter mold. Other projects are aimed at improving dairy products’ quality.

Recently, for example, Metzger’s organization created technologies to make low-fat processed cheese. “Processors used these insights to develop a healthier cheese, which is now being served to kids at school,” through the school lunch program, says Mary Higgins, vice president of dairy-ingredient marketing for the Midwest Dairy Association.

In another recent effort, the Center developed antimicrobial technology to improve the food safety of Mexican-style cheeses, which are booming in popularity. That technology “is now being commercialized by the industry,” Higgins says.

AURI-sponsored research projects will help the industry improve cheese quality and safety, and incorporate more whey and milk protein in consumer products. Whey is the watery part of milk that’s separated from the curd during cheese processing. It’s rich in protein and has many health and nutritional benefits, Higgins says.

Whey would be a great fit for high-protein or “functional” beverages, a market that is growing rapidly, Higgins says. The problem: “heat during pasteurization and further processing may break down the whey protein,” resulting in sediment at the bottom of a beverage, Higgins says. So the Dairy Foods Research Center is testing alternative technology for pasteurizing whey beverages. Effective pasteurization technology could open up new uses for whey, she says.

**More than  
80 percent of  
Minnesota’s milk  
production goes  
into cheese**

Energy and cereal bars are another promising market for whey and low-fat milk proteins. Sales in the energy bar category zoomed nine percent last year, Higgins says. With AURI support, the Center is adapting extrusion technology to puff up protein-rich nonfat dry milk into crispy bits for extra nutrition in snack bars.

The research projects are a collaborative effort of AURI, the Midwest Dairy Association and the Midwest Dairy Foods Research Center. They represent a \$350,000-plus investment in the industry, exemplifying how dairy industry sectors can work together to increase sales and demand for milk products, says Jen Wagner-Lahr, AURI project director and dairy specialist. “We look at this as a beginning. There are lots of opportunities for collaborating. Minnesota farmers are really benefiting from this.”

More than 80 percent of Minnesota’s milk production goes into cheese. The region’s cheese makers are asking for new ways to add more value to their products, Wagner-Lahr says. They also want to expand the markets for cheese-processing coproducts.

That’s where the Midwest Dairy Foods Research Center comes in. Funded by dairy checkoff dollars from the Midwest Dairy Association, the Center is a consortium of university scientists and processing experts from the University of Minnesota, South Dakota State University and Iowa State University. The Center, founded by Midwest farmers, does a wide range of dairy foods research.

The Center’s industry-focused research program is driven by the real-world needs of dairy processors says director Lloyd Metzger. “We develop tools and information to help them be more effective.” That benefits farmers and consumers alike, he says.

### Americans consuming more dairy

These projects are good examples of how processing research helps expand the demand for dairy foods and dairy ingredients, Higgins says. Since 1983, annual U.S. dairy product consumption has climbed from 522 pounds per person to more than 600 pounds today.

Higgins sees good prospects for continued dairy food growth, propelled by greater nutritional awareness and Americans’ desire for a healthy diet. She points to a recent survey by the Hartman Group, a consumer research firm, which found that 9 out of 10 people say healthy eating is very important. “Consumers are continuing to look for products that are nutrient rich.” ■

## AURI-sponsored dairy research

AURI and the Midwest Dairy Association are funding research to help Minnesota’s dairy industry grow and remain competitive. The research projects, valued at more than \$350,000, will help Midwest cheese makers improve safety and quality and increase markets for cheese-processing coproducts.

### New moo brew

Researchers are developing new technology to pasteurize whey beverages. Whey is a protein-rich coproduct of cheese processing.

### Crunch with punch

Researchers are testing manufacturing techniques for making extruded puffs and crisps from high-calcium nonfat dry milk. The nutritious “crunchies” would add a protein punch to cereal and energy bars.

### Heat buster

Cheese processors are often forced to discard a low-value product of milk filtration called “low molecular weight milk whey protein.” Researchers are evaluating the coproduct’s nutritional value for treating heat stress.

### Filter scrubbers

Researchers are testing new ways to clean and maintain the membrane filters used in cheese processing.

### Natural mold stoppers

Researchers are testing natural antifungal substances to deter mold growth in shredded cheese.

### Lactose meter

Researchers are testing a quick, inexpensive way to measure the lactose content of milk products. ■



The Midwest Dairy Foods Research Center, a university food-scientists consortium, conducts a wide range of dairy-food processing research. From left, Lloyd Metzger, director, and University of Minnesota scientists Devin Peterson and Baraem Ismail.

PHOTO FROM MIDWEST DAIRY ASSOCIATION



PHOTO BY ROLF HAGBERG

# Region's dairy industry growing again

BY LIZ MORRISON

AURI's dairy research initiatives come at a time when the Minnesota milk industry is growing again, after a long period of decline.

The state's dairy herd has increased for the last three years to about 470,000 cows, according to the Minnesota Department of Agriculture. Meanwhile, larger dairy states have seen their dairy cow numbers shrink.

Annual Minnesota milk production has increased about 2 percent per year for the past five years, says Bob Lefebvre, executive director of the Minnesota Milk Producers Association. Last year, Minnesota farmers produced 9 billion pounds of milk, up 3 percent from 2008.

Dairy is the state's second largest livestock sector, after hogs, contributing a quarter of the state's total livestock receipts, the ag department says.

In 2009 and the first half of 2010, low milk prices and the recession plunged Minnesota dairy farmers into "one of the worst — if not the worst — times ever," Lefebvre says. "Yet, we have continued to see long-term investment." In addition to adding cows, state dairy farmers have invested in new, modern facilities, such as free-stall barns and state-of-the-art milking parlors. "Minnesota farmers have been extremely resilient in this difficult period."

The region's dairy-processing capacity has also grown significantly in the last few years, Lefebvre says. First District Association in Litchfield, AMPI in Paynesville and Le Sueur Cheese Company in Le Sueur have expanded or are planning to expand, Lefebvre says. In the surrounding states, cheese processors in Milbank and Lake Norden, S.D., and Hull, Iowa have all increased their production capacity.

Other economic sectors are benefiting from dairy-farm growth, Lefebvre adds. Equipment companies, nutritionists, veterinarians, feed suppliers — all get a boost from a strengthening dairy industry, he says. "The infrastructure around dairy farmers has stabilized." The total economic impact of Minnesota's dairy industry tops \$11 billion annually, the ag department reports.

In other signs of growing strength, U.S. dairy exports are on the rise. In May, exports reached the highest monthly total since May 2008, pushing 2010 dairy exports up 62 percent compared to a year ago, says Mary Higgins, vice president of dairy-ingredient marketing for the Midwest Dairy Association.

"Dairy has been through a rocky time for the last 24 months or so," says Jen Wagner-Lahr, AURI dairy specialist, but she sees hopeful signs. "Minnesota is a good place to raise dairy cattle and produce dairy products." ■

## Quick facts about Minnesota's dairy industry

• In 2009, Minnesota had **469,000** head of dairy cows, about 5 percent of the U.S. total.

• Minnesota produced **9** billion pounds of milk in 2009, a 3 percent increase from 2008.

• **\$5.6** billion is Minnesota's dairy production and processing's annual output.

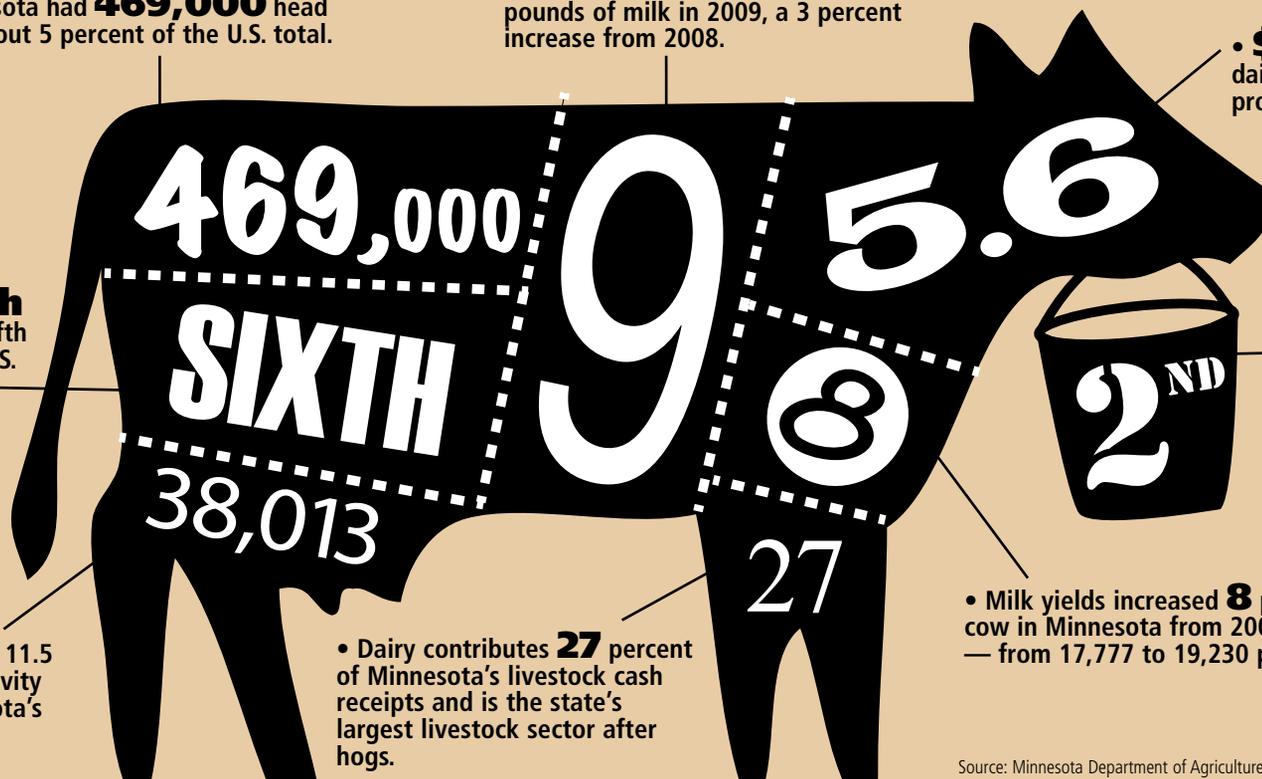
• Minnesota ranks **sixth** in dairy production and fifth in dairy exports among U.S. states.

• **38,013** jobs and 11.5 billion in economic activity are created by Minnesota's dairy industry.

• Dairy contributes **27** percent of Minnesota's livestock cash receipts and is the state's largest livestock sector after hogs.

• Milk yields increased **8** percent per cow in Minnesota from 2000 to 2009 — from 17,777 to 19,230 pounds.

• The **2nd** largest use of corn and 3rd largest use of soybeans is dairy-cow feed in Minnesota.



Source: Minnesota Department of Agriculture's "2009 Minnesota Dairy Industry Profile"

ILLUSTRATION BY BARB ETZKORN

# The Science of

AURI expertise helps grow a product from idea to market

BY CINDY GREEN

Innovation = ideas + implementation.

That's the formula AURI scientific and project development staff use to give a new ag product or production process its best shot at success.

Innovation isn't luck, it's a science.

"You can't just have an idea, you have to get it all the way to the marketplace," says Teresa Spaeth, AURI executive director.

"We take innovation seriously. We think about it and study what creates success and try to replicate it. We build our programs on that, so we can be a true R&D (research and development) arm for agriprocessors," says Spaeth, who has conducted extensive literature reviews on the predictors of innovation success.



## Success recipe ● ● ● ● ● ● ● ● ● ●

Identifying an opportunity "is important, but not everyone gets it right," Spaeth says. "Just because your neighbor says he would buy one does not mean it is feasible. One of the most important functions we provide is feasibility studies."

Success also requires the right combination of "implicit" knowledge, based on experience, and academic knowledge, based on research and testing, Spaeth says.

"The number one predictor of success is how well an entrepreneur plugs into a network," Spaeth says. "We do our best to link entrepreneurs to the best resources possible ... plugging into the right professional network for assistance, mentorship and development."

"Partnerships are important for ensuring that clients have the resources they need to support their entire business structure," says Kate Paris, AURI planning and project director.

"It takes more than just a wonderful new product or process to make an innovation accepted in the marketplace. Many inventors immediately seek capital, but may not have the business or marketing savvy to successfully commercialize their idea."

Research shows innovators also need "dynamic capabilities — taking current resources and connecting them to make something new," Spaeth says. "It's the ability to constantly reshuffle the deck."

Although technology has changed, "basically, the resources of the world have not changed. Advances come from reconfiguring (resources) and finding new uses."

## AURI expertise ● ● ● ● ● ● ● ● ● ●

AURI's talent pool includes animal and food scientists, chemists, a plant pathologist and staff with business development expertise. And they can connect clients to experts outside of AURI's staff, such as chemical and mechanical engineers or marketing specialists.

While there are many areas of innovations, AURI concentrates on food processing, renewable energy, biobased products and uses for ag waste and coproducts. "In every one of those areas, we're stretched to keep up with all the innovations that are going on," says Doug Root, AURI chemist.

AURI facilities include food product and fermentation/chemistry labs in Crookson, fat/oils and meat labs in Marshall and a coproducts lab in Waseca. By locating labs in rural areas, AURI is promoting business development in Greater Minnesota.

"You don't know what it's like to combine, until you've sat in the combine," Spaeth says. "Our scientists live in rural communities" and know the issues rural businesses and processors face. "It's an understanding of what it's like to walk in those shoes."

"Our purpose is to be the R&D arms of small to medium ag processors. They are in rural Minnesota so we need to be in rural Minnesota."

## Innovations solving problems ● ● ● ● ● ● ● ●

Root says success is "starting with the idea that there is some problem and turning it into opportunity."

The process of bringing an innovation to commercialization can take years — formulating, testing, analyzing, reformulating, business planning, decision making, market researching, financing — and not necessarily in that order. But the payoff is often well worth the time and money invested.



# Innovation isn't just science



# Innovation **S★U★P★E★R★S★T★A★R★S**

BY CINDY GREEN

What's your favorite innovation?

AURI's scientific and project development staff, with decades of experience, were asked to identify AURI project "stand-outs." Their responses ranged from unconventional food products to new uses for waste to kitty litter. Not only have these innovations added value to ag products, most have created jobs and economic activity in rural communities. AURI played a role in all of these innovations...



## ★ **HIS AND HER HEALTH BREADS**

*French Meadow Bakery Men's and Women's breads*

A decade ago, Lynn Gordon, French Meadow Bakery owner asked AURI food scientist Charan Wadhawan to help her develop breads with enhanced nutritional benefits. One was targeted for women's health; the other for men. "We established target levels of protein and fiber per serving," and identified ingredients with health properties "backed by research" such as soy isoflavones and whole grains, Wadhawan says.

Today, the breads are marketed throughout the United States and Gordon has been interviewed by ABC, CBS and CNN. Recently, French Meadow's bread line was purchased by Rich Products.

## ★ **CUT THE GAS**

*Low-O soybean varieties*

Some sugar molecules in soybean fiber – called oligosaccharides — are difficult for baby pigs and poultry to digest, causing gas. AURI and U of M researchers developed an extraction process to make low-O soybean meal, but it wasn't cost effective.

"We found folks growing varieties of soybeans with much lower amounts of oligosaccharides," says Doug Root, AURI scientist. "That's a real benefit. ... They were the first to grow low-O soybeans specifically for feed."



AURI is still conducting tests on the low-O bean varieties. "We'll get the information out so that the benefits of low-O soybean meal are widely known," Root says. "Soybean producers and processors are paying attention to our studies," and its likely low-O soybean meal will be available in the future. The low-O soybean trait may also be valuable for edamame or tofu.



## ★ **SIZZLING POULTRY**

*Ferndale Market turkey sausages*

Ferndale Market turkey producers near Cannon Falls asked AURI meat scientist Carissa Nath to help them design fresh turkey sausages to expand their markets. Ferndale's distributor, Ron-mar Foods, noticed chicken sausage's growing popularity and "asked if we could capture some of those flavors in our inventions," Nath says.

With a good understanding of white and dark meat characteristics, Nath determined the best combination to ensure "a great texture in the final product." She then experimented with various ingredient blends and settled on three flavors: red pepper and garlic, spinach and feta cheese and Italian." Formulating food products requires scientific knowledge of how ingredients will perform and interact when they are added.

The sausages are copacked at Lorentz Meats in Cannon Falls and distributed by Ron-mar — primarily to Twin Cities food co-ops but Ferndale expects to expand markets.

## ★ **HOMEGROWN ENERGY**

*Biomass-fueled greenhouse*

The Kreidermacher family in Altura, Minn. operates the Pork and Plant Greenhouse where they raise perennials and annuals in the summer and poinsettias for the holidays in their 65,000 square-foot facility. In the winter 2007, they decided to become more energy independent, using biomass they produce to heat their greenhouse.

AURI scientist Al Doering investigated densifying a variety of feedstocks into pellet fuel and helped the Kreidermachers build a pelleting facility on their farm. The greenhouse no longer uses propane and their heat costs are stable.



## ★ **SWEET AS MOLASSES**

*Xylose extraction from ag residues*

AURI's Doug Root, scientist, and Randy Hilliard, project director, are working with the Reluceo company to extract xylose (C5 Molasses) from agricultural residues such as corn cobs and wheat straw. The ultimate goal is to supply a C5 molasses to the bio-based polymer industry for production of new plastics.



## ★ **ASH TO FOOD**

*Densifying waste ash for corn fertilizer*

In 2007, fueled by high-fertilizer prices, AURI started investigating using ash waste to fertilize corn fields. AURI's Al Doering evaluated technologies for densifying ash from renewable-energy systems, so it could be land applied without 'dust' being an issue. Nutrient trials were conducted at the University of Minnesota research center in Waseca with good results.

Industry partners included Corn Plus Ethanol in Winnebago, North American Fertilizer in Olivia and Chippewa Valley Ethanol in Benson — all in Minnesota. Two of the facilities have created new jobs for handling and applying ash. "And grain producers have a new ag-based, competitively-priced fertilizer for crop production," Doering says.



## ★ **KITTY CRUMBLES**

*Swheat Scoop cat litter*

Pet Care Systems started making ag-based, flushable cat litter in 1998 — first as a ground, wheat-only litter. AURI's Al Doering helped the Detroit Lakes company upgrade to a granulated litter, which he tested for sorbency, clumping and ammonia-control and ensured it would be certified for septic systems. The process was patented and commercialized.

Michael Sparby, AURI project director, says assisting Swheat Scoop with marketing and packaging was his first project when he started at AURI 14 years ago. "The concept of alternative litter was extremely new," he says. Innovator Mike Hughes was ahead of his time, targeting a specific market—"single female cat owners, ages 25 to 45 years, living in East and West Coast apartments," Sparby says.

A major share of the company has been sold to Farmers Union Industries and the product is marketed throughout the United States in Target and pet stores and in some international markets.

"Over 12 new jobs were created, the company is utilizing thousands of bushels of wheat from Minnesota and the Dakotas, and a spin-off companion (Swheat Stall horse bedding) has been developed," Doering says. ■



# Summer Showcase

BY DAN LEMKE

AURI hit the road during the dog days of summer and promoted agricultural products at Farmfest and the Minnesota State Fair, two of the state's biggest events.

More than 36,000 people attended Farmfest on August 3-5 at Gilfillan Estate near Redwood Falls. AURI's large tent exhibit, with agricultural innovations and information, is a major presence at the three-day event. AURI clients, such as Environmental Dust Control, with an ag-based road dust suppressant, and BOLT Enterprises, makers of Prairie Smoke Barbecue Sauce, used the opportunity to showcase their products.

For nearly 20 years, AURI's participation in Farmfest has helped the Institute connect with agricultural producers, policy makers and ag leaders to raise awareness of the value innovative agriculture brings to the state.

The 12-day Minnesota State Fair drew more than 1.7 million people who came to see farm animals, entertainers, merchandise, art exhibits, fish ponds and science demonstrations.

But mostly, they came to eat — and not everything deep fried on a stick.

For the eighth year, the Minnesota Cooks event on August 31 featured gourmet dishes such as pimento smoked pork belly, butternut squash puree and arugula salad with smoked bison. All were made by premier Minnesota chefs using fresh, local ingredients.

Each of Minnesota Cook's eight 45-minute shows, from 9 a.m. to 4 p.m. present a different set of recipes. Chefs demonstrate cooking techniques and Minnesota farmers who produced the ingredients talk about their operations. Celebrity tasters and fair visitors are treated to samples.

This year's tasters included Senators Al Franken and Amy Klobuchar, Minnesota Olympian Carrie Tollefson, Minneapolis Mayor R.T. Rybak and AURI Executive Director Teresa Spaeth. The event is hosted by the Minnesota Farmers Union and Food Alliance Midwest, with major sponsorship from AURI and the Minnesota Department of Agriculture. ■

Photos: At top left, Create Catering chef Philip Dorwart prepares apple-squash gnudi with prosciutto and apple cider caramel using local farm ingredients and, in the middle, Minnesota State Fair visitors sample herb-marinated leg of lamb prepared by Chef Kevin Kathman using ingredients from The Lamb Shoppe of Hutchinson, Minn. The food demonstrations were featured at the Minnesota Cooks event at the state fair's Carousel Park (lower right), sponsored in part by AURI.

Top right: AURI scientist Kevin Hennessy discusses drying technology and, lower left, AURI meat scientist Carissa Nath offers fresh brat samples in AURI's tent exhibit at Farmfest 2010.

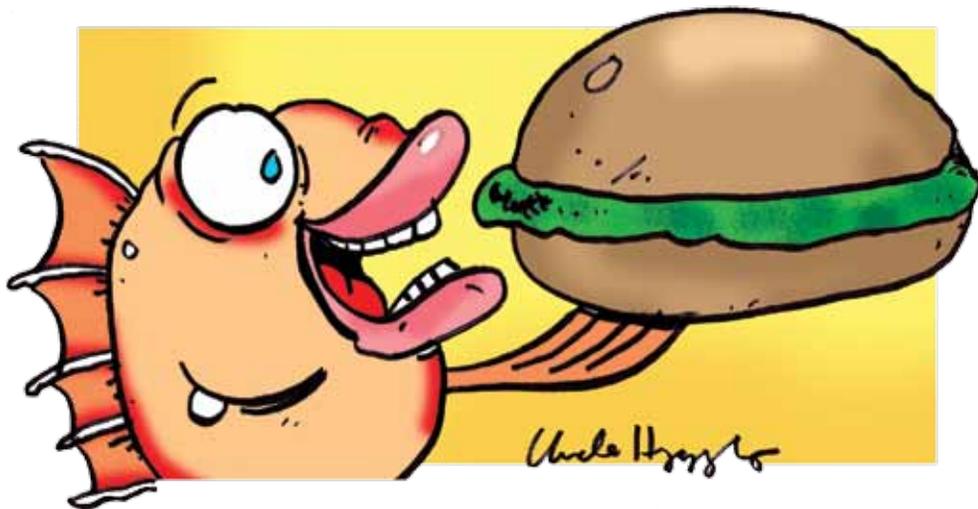


PHOTOS BY DAN LEMKE

# 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.



## Algae burger anyone?

Dutch researchers are extracting proteins, oils and carbohydrates from cold water algae, which could lead to a new protein source and a meat replacement. Scientists at the Netherland's TNO research institute say algae is also a good source of omega-3 and omega-6 fatty acids. They expect it will take at least two years to develop extraction and refining techniques before the algae ingredients are ready to market.

From: Foodnavigator.com  
August 4, 2010

## SUV recycled

The Ford Motor Company has announced the 2011 Explorer made from 95 percent recyclable materials — including fiber, steel and soy-based foams. The seat cushions and backs are made with 40 percent soy urethane, which the company says reduces their annual petroleum use by more than 10,500 barrels.

From: Ford Motor Company  
August 6, 2010

## Veggie packaging

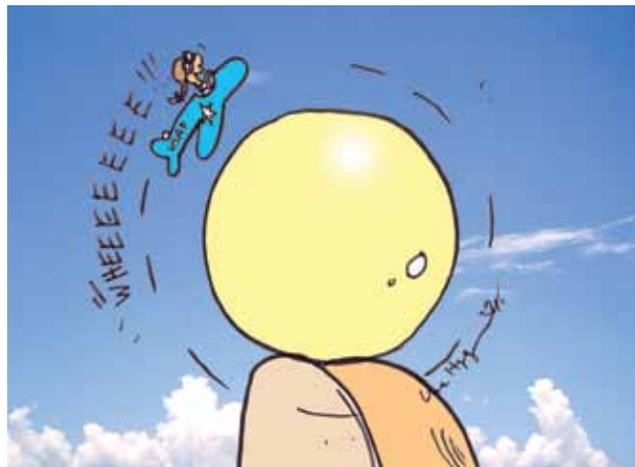
Steelcase, the global office equipment manufacturer, has started shipping some products in biobased packaging made from agricultural leftovers. Produced by the Ecovative company, the EcoCradle packaging material is made from cotton seed hulls and mushroom roots. The product is completely degradable, breaking down in approximately 30 to 45 days.

From: Biobasednews.com  
June 14, 2010

## Smooth takeoffs

A soy-based sealant is giving Air Force planes a smooth liftoff. RePLAY is designed to penetrate asphalt and repel moisture while strengthening and repairing existing pavement without impacting skid resistance. The soy-based product has been cleared for takeoff at Tyndall Air Force Base in Florida.

From: Biobasednews.com  
July 22, 2010



## Compost socks

Filter socks, mesh tubes filled with compost, are very effective at removing contaminants from storm water runoff, ARS researchers have discovered. The tubes capture silt, heavy metals, fertilizers and petroleum products washed from compacted surfaces such as construction sites and storm water drains, thereby protecting nearby streams, rivers and lakes.

ARS researchers also added flocculation agents, which cause sediments and pollutants to form larger clumps, making them easier to filter. Scientists found the tubes with flocculating agents removed even more pollutants from runoff, including 99 percent of E. coli bacteria, 99 percent of motor oil, more than half the gasoline and from 47 to 74 percent of heavy metals.

From: USDA-ARS  
July 23, 2010

## Tooth friendly pop

Long considered a tooth decay culprit, German research shows that soft drinks could be formulated to help protect teeth. Scientists at the Institute of Materials Science and Technology determined that food gums, derived from ingredients such as milk proteins, provided a protective layer on tooth enamel. The gums could be added to soft drinks to protect teeth from decay and enamel softening.

From: Dental Materials  
August 4, 2010



## Cinnamon to the rescue?

A USDA research project suggests cinnamon extract could help reduce diabetes and heart disease risk factors. The water-soluble extract was given to study participants considered pre-diabetic, with blood glucose levels higher than normal but not yet high enough to be diagnosed with diabetes. Study participants who received the cinnamon extra showed marked reduction in blood glucose levels and an increase in antioxidant levels.

From: USDA-ARS  
August 24, 2010

## Corn plastic beats the heat

Poly-lactic acid or PLA is a plastic made from fermented corn sugar that is used in a range of products such as containers, clothing and building materials. But the bioplastic doesn't hold up when "hot filled" juices or ketchup are poured into containers while they are still hot from pasteurization. So USDA researchers have developed a heat-deflection temperature modifier that could be blended with PLA to make it more heat tolerant. The modifier is more than 90 percent corn-based and fully biodegradable.

From: USDA-ARS  
September 1, 2010



# Driving our economic engine

BY TERESA SPAETH

Minnesota's abundant natural resources and rich agricultural assets attracted settlers to the state centuries ago. They also contributed to the state's growth and prosperity. Communities sprang up around the state as agriculture's economic engine drove Minnesota. Jobs and rural development followed and many of Minnesota's largest and best-known companies grew from agricultural roots.

While the number of people actively involved in farming has decreased, the industry has tremendous staying power. Economic impact figures show that agriculture remains the second largest employer in Minnesota. However, nearly 80 percent of all agricultural jobs exist off-farm in areas such as distribution, services and processing.

Agriculture has long been a cornerstone industry, supporting other sectors including manufacturing, transportation, construction, banking, real estate and others. Although

nearly three fourths of the state's population lives in urban areas, they are directly impacted by the health of the agricultural industry.

There is no question the agricultural landscape has changed over time, but what hasn't altered is agriculture's significance in rural economic development. Over the years, AURI has been involved with innovations that have had far-reaching impact — not only on agriculture, but rural communities and the state. These innovations have spun off jobs and economic activity beyond an individual business.

Agricultural processing, including innovations in biofuels, bio-based products, food and coproduct utilization will continue to spark economic development in rural communities. It is vital in difficult economic times that we focus on what is proven to spawn economic growth. Agriculture has a long history of economic importance and we firmly believe it will play a starring role in rural economic development and resurgence. ■



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
- Potential for grant funds to qualifying applicants

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 financial 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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## AURI ag quiz

1. According to IRETI director John Frey, about what percentage of the nation's energy consumption is used for transportation?

- a. 62%
- b. 27%
- c. 11%

2. What is the name of the new meal replacement bars developed by a Minnesota nutritionist?

- a. Munchies
- b. Snackers
- c. Wellies

3. What biobased product is being used and tested as a wood preservative carrier?

- a. Biodiesel
- b. Glycerin
- c. Distiller's Dried Grains

4. Americans consume about how many pounds of dairy products per year?

- a. 312 pounds
- b. 75 pounds
- c. 600 pounds

5. For about how much economic impact is Minnesota's dairy industry responsible for each year?

- a. \$3 million
- b. \$11 billion
- c. \$700

6. What initiative is AURI developing to connect businesses and entrepreneurs with emerging opportunities?

- a. Idea Roundtable
- b. Group Think
- c. Innovation Launching Pads

7. True innovation requires \_\_\_\_\_?

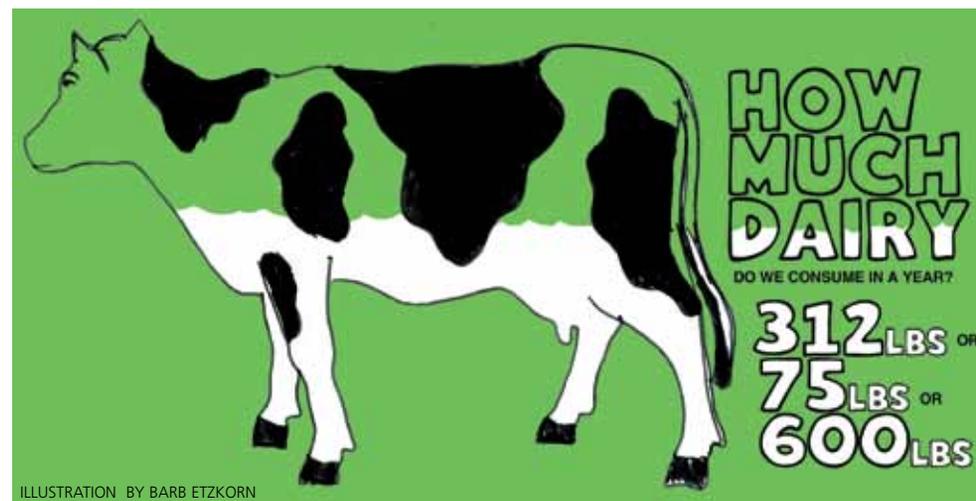
- a. Implementation
- b. Cash
- c. No planning

8. How much of Minnesota's dairy production goes into cheese?

- a. 18%
- b. 80%
- c. 33.3%

9. Besides Ag Innovation News, where can AURI information be found?

- a. [www.auri.org](http://www.auri.org)
- b. Facebook
- c. Twitter
- d. All of the above



Answers: 1) b 2) c 3) a 4) c 5) b 6) c 7) a 8) b 9) d

### ABOUT AG INNOVATION NEWS

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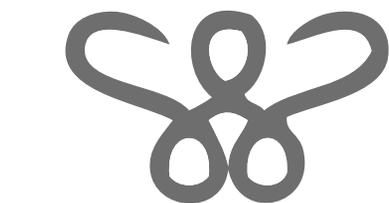
For more information on AURI, call 1-800-279-5010 or visit [www.auri.org](http://www.auri.org)



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## Nutritionist designs **wellies** bars made with all-natural local ingredients



BY ASHLEY HARGUTH

We all want to eat healthy. But often there isn't time to make a nutritious meal — like after a tough workout at the gym, picking up hungry kids from soccer practice or running to an evening meeting after a full day of work.

For those times, nutritionist Teri Rose has created Wellies. The meal replacement bar is distributed by Rose's company, Perfectly Produce, which offers consulting services in meal planning and nutrition.

"Wellies are a true on-the-go filling meal," Rose says. Consumers can purchase a full-size 98-gram bar or a package of three snack-size bars. "The snack sizes are great for pre or post workouts, a snack on the run, or for kids," Rose says.

The ingredients in Wellies Country Oatmeal bars include dried organic egg whites from pastured chickens, whey, a variety of grains, maple syrup and honey — all sustainably grown in Minnesota and surrounding states. Rose says a few other prepared meal replacement bars exist in the market, but none have the same profile as Wellies. Most are aimed at vegetarian and vegan consumers.

Rose wasn't always a food entrepreneur. Years ago, she worked in the advertising and publishing industry and was exposed to food product development through a

marketing project. It piqued her interest, and she decided to pursue a graduate degree in nutrition. Soon after, she started Perfectly Produce.

An acquaintance, who had worked with AURI food scientist Charan Wadhawan, recommended that Rose contact AURI. "Charan was a wonderful resource; she was very respectful of my goals and helped find alternatives to keep with the product's mission," Rose says. "AURI was invaluable ... having a food scientist and kitchen facilities."

Wadhawan helped Rose through product improvements such as enhancing the bar's flavor by bringing out different taste notes and conducting nutritional analysis and a shelf-life study. "Charan introduced me to the processes and equipment to be efficient in creating my bars."

AURI scientist Ed Wene conducted microbial testing for food safety and chemical analysis for label information. "Now I have confidence knowing my bars have been reviewed," Rose says. AURI staff also connected her to local growers for ingredients.

Wellies are available online at [www.eatwellies.com](http://www.eatwellies.com), and Rose is in discussions with other outlets such as Twin Cities yoga studios. She is also working on a "cross-marketing relationship" with her ingredient suppliers to market Wellies.

Rose, who plans to expand her product line, says she loves offering nutritious meals made with quality food ingredients. "I hope this is only the beginning of my story." ■

Photos from [facebook.com/eatwellies](https://www.facebook.com/eatwellies)