



AG INNOVATION NEWS

The newspaper of the Agricultural Utilization Research Institute

JULY-SEPT. 2002
VOL. 11, NO. 3

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PHOTO BY ROLF HAGBERG

How AURI works

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Introducing a winner

BY EDGAR OLSON
AURI EXECUTIVE DIRECTOR

As Webster puts it, innovation is the "introduction of something new." Sounds simple enough, but being truly innovative is an arduous task. In business, it's not enough to introduce something new, it has to be something people want and are willing to buy — not just once, but again and again. Then the cycle must be maintained for years. It's easy to see why launching a venture is not for the faint of heart.



OLSON.

AURI is fortunate to have worked with many innovators. We think it's time to recognize those contributions.

For the first time, we have named an Ag Innovator of the Year. The award is presented to an AURI client who has shown innovation in a product or process, successful entry and sustained success in the marketplace, significant utilization of Minnesota commodities, innovation in filling a market need, and positive impact on Minnesota agriculture.

This year's award goes to Pet Care Systems, Inc. and its founder Mike Hughes. Pet Care Systems manufactures Swheat Scoop pet litters, made from nonfood grade wheat. First introduced eight years ago, Swheat Scoop has reached about 7,000 stores nationwide, including Target, several regional Wal-Mart stores and pet retailers like PetSmart and Petco.

AURI is proud to have assisted Pet Care Systems' success over the years. Our staff has provided hours of assistance both on-site and in our labs to help develop and improve the wheat-based litters.

AURI can't take all the credit, however; business savvy and tenacious work by the people at Pet Care Systems are the reasons for their success. And as their partners, we congratulate them on their innovative spirit and celebrate the opportunity to have had a hand in helping them achieve their goals.

Pet Care receives ag innovator award

BY DAN LEMKE

Detroit Lakes, Minn. — One of Minnesota's premiere pet product companies was awarded the inaugural AURI Ag Innovator Award at a luncheon here June 19.

Pet Care Systems, Inc. of Detroit Lakes and its president Mike Hughes were selected for the award by the AURI board of directors. Pet Care produces "Swheat Scoop" wheat-based small animal litters.

The Ag Innovator Award is presented annually to an AURI client with an innovative product or process that has achieved commercial success and utilizes significant amounts of Minnesota agricultural commodities. It is also meant to draw attention to the contributions value-added agriculture has made to Minnesota's economy.

"I think the board made an excellent choice in selecting Pet Care Systems," said AURI Executive Director Edgar Olson. "Pet Care has made good use of AURI technical services, plus they've reinvented their product to match consumer needs and stay viable in the marketplace. Their success has added

value to wheat that otherwise would likely have ended up as livestock feed."

Pet Care Systems introduced Swheat Scoop litter more than seven years ago as an alternative to clay litters. Last year the company introduced a new generation of crumbled litter that is more absorbent and works in self-cleaning litter boxes, yet retains its original deodorant characteristics and is scoopable and flushable.

Printer awarded for Ag Innovation News

For "superb craftsmanship" in producing Ag Innovation News, the St. Cloud Times recently received a bronze award from the Central Minnesota Printing Professionals organization. Printing supply vendors selected the "Gallery of Superb Printing" award recipients from more than 50 entries submitted by printers from central Minnesota and the metro area. The Times has printed AURI's quarterly newspaper since it was launched in January 1992.

There's more than cheese curds and pronto pups at the Minnesota State Fair

Visit AURI's interactive exhibit at Agri-Land on Machinery Hill. See where innovative products are popping up — test your ag IQ — have fun while you learn.

**AUGUST 22 THROUGH
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Visit AURI at Farmfest 2002

See the latest in value-added agriculture in Minnesota — from food to fuels.

The AURI Exhibit is located next to the Forum tent in lot 612

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Published by the Agricultural Utilization Research Institute to inform the food, agriculture and business communities and the general public about developments in ag-based products.

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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.



Following is a brief overview of AURI services. For more information, contact the office nearest you.

An Initial Project Assessment helps determine the technical and market feasibility of an ag-based product or technology. Applicants must demonstrate their projects will impact the use of traditional or alternative crops and livestock. The IPA program is designed to add value to agricultural commodities and foster long-term economic growth.

The Market Assessment Program identifies new or alternative market opportunities that add value to Minnesota farm commodities and benefit the state's producers. MAP is open to farm organizations, commodity groups, grower associations, agribusiness groups, public entities, nonprofit organizations and/or producer groups and is specifically designed for projects where a business or research partner is not yet involved in commercialization.

The Technology Transfer program identifies and develops value-added technologies and helps move technology from public and private entities to Minnesota businesses. Applicants must demonstrate the technology will impact commodity use.

The Pesticide Reduction Options program funds research and demonstration projects intended to reduce the use of petroleum-based products in farm production.

AURI's Applied Research Services complement technical and financial assistance. The Institute's research staff works with agribusinesses, university scientists, federal labs and commodity groups to access new technology and link it to commercial partners.

AURI also operates several **laboratories and pilot plants** that support innovative, ag-based product development. With staff expertise and commercial-grade equipment, the facilities offer a full range of services, from ingredient analysis to test production runs.

Facilities include:

- Pilot Plant and Product Development Kitchen, Crookston
- Waste Utilization Laboratory, Waseca
- Fats and Oils Laboratory, Marshall
- Meat Laboratory, Marshall

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Entrepreneurs Gary Sterner (left) and Dan Conroy say deBarbeque sells the only sauce-free smoked ribs in major Twin Cities stores.

BY E. M. MORRISON

Montrose, Minn. — Dan Conroy and Gary Sterner prefer to eat their barbecue bare naked.

The two entrepreneurs market smoked pork ribs sans barbecue sauce. Their product, deBarbeque, is finding a niche at Minnesota meat counters, where it is the only "bare naked" ready-to-eat pork rib.

Conroy and Sterner introduced deBarbeque in December and are on track to sell 500,000 pounds of product this year. The fully-cooked ribs are available at major Twin Cities supermarkets, including Rainbow Foods, Cub, County Market, Jerry's, Lunds and Byerly's.

"People like our ribs because you can throw them right on the grill" without worrying about burning the sauce or making a mess, says Conroy, president of deBarbeque, Inc. Besides, "most people would rather put on their own barbecue sauce. ... One day I invited 25 people over for barbecued ribs and told them all to bring their favorite sauce. ... They brought 25 different sauces."

A 30-year veteran of the wholesale food business, Conroy says Minnesota is ready for bare-naked barbecue, long popular in the South. He heard frequent requests for a good smoked rib when he was sales manager at U.S. Food Service and Food Service of America. "But there was nothing available without a sauce. I saw a need."

Conroy, who lives in Wayzata, left the corporate world three years ago. A little bored with retirement, he called up his friend, Gary Sterner, and said, "Do you want to go into the rib business?" ... And that's how this all started."

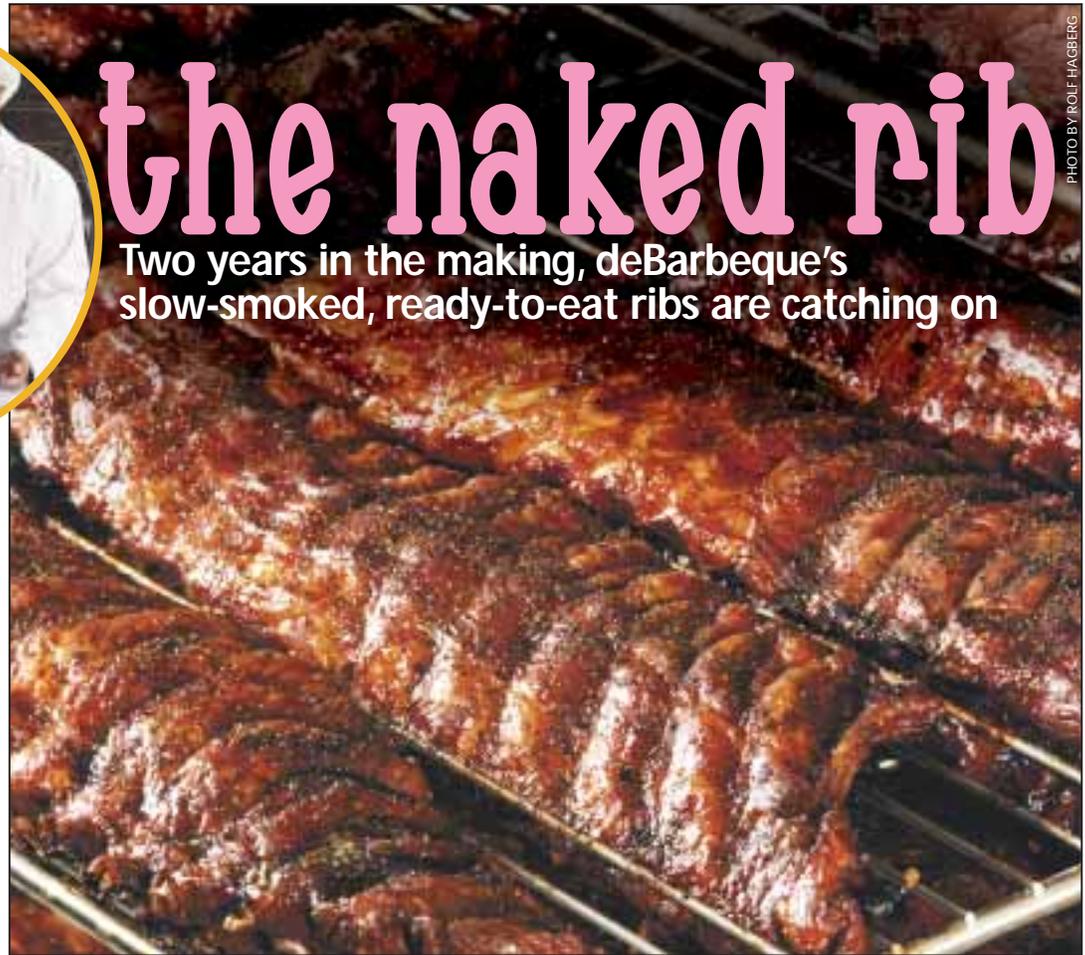


PHOTO BY ROLF HAGBERG

the naked rib

Two years in the making, deBarbeque's slow-smoked, ready-to-eat ribs are catching on

smoking in a brick house

Sterner, of Winsted, has been smoking ribs for more than 20 years. His father, Joe Sterner, a retired dairy-equipment manufacturer, had an old brick smokehouse. "He used his own dry seasoning rub, and he'd go out to the smokehouse for the better part of a day and smoke the ribs, and everybody loved them." Gary Sterner continued his dad's smokehouse tradition, making pork barbecue "people went wild about," he says.

Duplicating the Sterner family's homemade ribs using modern commercial food processing methods took a lot of technical know-how, however. So Sterner and Conroy came to AURI for help.

Scientists Darrell Bartholomew, Ted Gillett and Brian Reuter of AURI's Marshall meat lab adjusted Sterner's recipes. Using a commercial smoker, they experimented with cooking

times and temperature, oven humidity, types of wood smoke and other variables. AURI also helped the pair develop food safety procedures and navigate the complex licensing process. It took more than two years to get everything set, Sterner says.

Late last year, deBarbeque opened a 5,000-square-foot, USDA-inspected processing plant, financed by local lenders and tax incentives from the city of Montrose.

Starting with small, lean ribs, deBarbeque uses computerized equipment controls for each production step, from marinating and seasoning to the eight hours of slow cooking that produces tender, flavorful meat.

dry-rubbed demos

DeBarbeque ribs "took off right away," says Conroy, who thought up the "bare-naked" marketing angle. While grocers like the 90-day

shelf life, consumers are drawn by deBarbeque's distinction: ready-to-eat ribs. "We're the only one without sauce that I see in the major stores."

The ribs retail for \$9.95 to \$12.95 per pound, comparable to deBarbeque's main competitor. Although the ribs are marketed through a food broker and distributed by Royal Foods and J and B Group, "I do a lot of the sales myself," says Conroy, who makes store calls five mornings a week.

The company markets with weekly in-store demonstrations, spending about \$5,000 a month on free samples and store discounts. "Either you give it away in product demos or on discounts, to get people to try it," Conroy says.

He and Sterner do most in-store demos themselves. Though demos consume their

the naked rib TO PAGE 14

People, labs and pilot plants



How AURI Works part III AURI product development

Editor's note: This is the third installment in a series exploring AURI services to Minnesota. The first segment surveyed AURI's mission and projects; the second overviewed the application process. In this issue, AURI's technical services are on display, including its scientists, technologists, pilot plants and laboratories.

BY CINDY GREEN
PHOTOS BY ROLF HAGBERG

The 1987 state legislature wasn't thinking about quick name recall when it established the Agricultural Utilization Research Institute. Try building name recognition with 15 syllables.

But AURI never intended to be a public relations outfit; it takes every word of its name seriously — agriculture, new uses, research.

With three laboratories and three pilot plants located in three corners of the state, and a dozen scientists and technologists ready to help with their various areas of expertise, AURI provides statewide services unrepeated by any other organization.

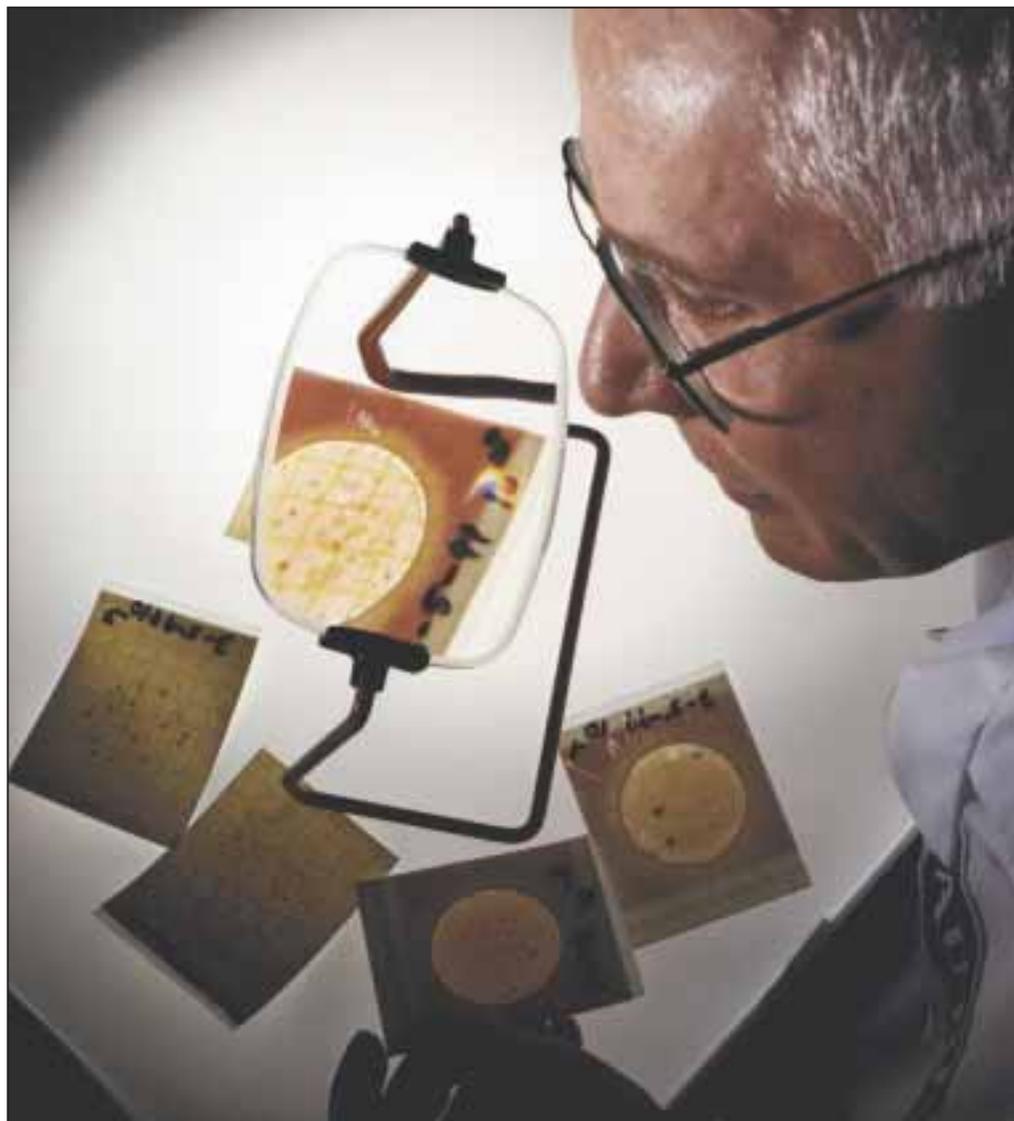
"We do applied research, not basic research," says Keith Sannes, AURI deputy director in Crookston. "We help businesses evaluate the usefulness or the efficacy of technology that's right at the commercialization stage."

Over the past few years, AURI has shifted away from providing financial assistance packages to value-added ventures. New product initiatives are inherently high-risk. Even with the best of help, failure rates can exceed 90 percent. Rather, AURI is focusing on providing enough technical help to strengthen a business's position for attracting private financing.

"We don't lead with our checkbook; we lead with our technical services and people, backing that up with a little money if needed," says Max Norris, senior scientist in Marshall.

That can mean analyzing, testing and doing trial production runs of a new natural fertilizer or a lamb entrée or pea fiber. Some of AURI's work may not be fully realized for awhile, such as 10 years of work on biodiesel or plastics made from agricultural materials. But the AURI researchers working in the labs and pilot plants featured on the following pages know that when products reach their potential in the marketplace, the state's economy will benefit long-term. ■

AT RIGHT: At AURI's meat laboratory in Marshall, scientist Darrell Bartholomew counts bacterial colonies from swab samples transferred to petri film.





The proving ground

AURI's pilot plant reduces companies' up-front risk and encourages innovation

Got a new product? Let it prove itself. Todd Sisson, who manages AURI's pilot plant in Crookston, runs trial batches of food and ag-based industrial products for refining and market testing.

"We work directly with clients to help develop their products, refine their processes, develop quality control systems and make test-marketable quantities of their product," Sisson says. The 4,000-square-foot pilot plant can process vegetables, fruits, cereal grains and other products with its collection of blanchers, mixers, dryers, blenders, freezers, packaging equipment, mills and extruders.



Sisson.

For example, Sisson is helping a rhubarb cooperative with initial processing runs, giving growers time to find markets and build revenues for their own facility. "We bring the rhubarb into the plant ... it's cleaned to remove defects and disinfected to destroy soil-borne bacteria. Then it's rinsed again, blown dry, cut to the size specified by the end user, and frozen in 8-pound bags."

Sisson brought Forest Edge Winery, which makes rhubarb wine, to the attention of the seven-grower co-op, and the two clients have formed a working relationship. The co-op has also connected with a local jam business and bakeries.

Besides the hands-on work, Sisson investigates market opportunities. He helped a local bean company, once struggling with diminishing markets, to take advantage of fiber opportunities. "We had seen a trend in pet foods integrating more fiber into feed," Sisson says. He and the client investigated a pea-splitting operation in Canada to see if fiber could be extracted from its waste stream of hulls and splitter-damaged peas.

"We proved fiber could be separated out and concentrated. ... As the client looked into it with more depth, he realized the opportunity of turning his bean elevator into a pea-splitting operation, where he is custom-splitting for various companies," Sisson says. "I believe last year's production was in excess of 15 million pounds. They're running about 80,000 pounds of material a month." Waste pieces are ground and shipped to pet food manufacturers.

To maximize the pilot plant's usefulness, AURI is expanding beyond new businesses, says Deputy Director Keith Sannes. "We're making an effort to get to companies already up and running — they have banking lined up and know how to get into the markets. ... They may have new product ideas they want to experiment with but can't dedicate equipment to it. We can work it out in the pilot plant." ■



Todd Sisson moves beans from cooker to conveyor at AURI's pilot plant in Crookston where he helps clients develop new products, refine processing methods and run trial batches of products for test marketing.



Poplar Potential

AURI is invested for the long term in an alternative fiber crop

AURI hosts one of largest hybrid poplar breeding programs in the country. “We’re producing thousands of new crosses every year,” says Edward Wene, an AURI scientist who works on poplar research and technical assistance to growers.

Why hybrid poplars? They are good candidates for wood products because they mature in only 10 to 15 years, Wene says. Similar to native aspens, they can be used in oriented strandboard or paper products. Although poplars have potential to be a biomass fuel source as well, “presently there are no energy markets,” Wene says. “But there are fiber markets.”

AURI is looking at whether raising poplars can be viable for farmers, Wene says. “There are several things we can do to affect the outcome: improve the yield with proper management, site selection and planting



At a growth chamber in Crookston, AURI scientist Edward Wene checks hybrid poplar seedlings that will be placed in field trials to determine the best locations and production methods for the alternative fiber crop.

material, and locate in an area where there’s a market.”

Wene is a member of the Minnesota Hybrid Poplar Research Cooperative, formed in 1995. The core group includes Wendell Johnson of the University of Minnesota in Crookston, Bernie McMahon and Bill Berguson of the Natural Resources Research Institute in Duluth, and Don Reimenschneider of the U.S.

Forest Service in Rhinelander, Wisc.

Now working with a \$180,000 annual state appropriation and an \$80,000 cash match from five industry partners and the U.S. Department of Energy, researchers started the cooperative to develop fast-growing and disease-resistant clones and to assist growers.

Each year, controlled pollination in a greenhouse is used to produce 8,000 to 10,000 seedlings for field trials.

“We spread trials around the state to see how different environmental conditions affect growth and disease resistance,” Wene says. Other research includes fertilizer and herbicide trials.

Industry partners International Paper, Boise Cascade, Blandin and Potlatch either own or lease land for commercial trials. “We embed our trials right in their commercial plantations. Before, our researchers had to go out and rent space and do the weed control,” Wene says. “This allows us to have many more trials in more locations.”

The researchers are continuously breeding new varieties. “Hopefully, with new clones, yields will go up,” Wene says. Most are crosses between native cottonwood and European or Asian varieties. “Native cottonwoods are good growing trees, but sometimes they don’t root well. So we bring in varieties with better rooting ability. ... It’s not all hit and miss; we know from past experience what combinations work.”

None of the hybrids have been commercialized yet. “The oldest trees are five, six years old, so we are starting to make selections, but none have been field-proven yet,” Wene says. “Before we release a clone, we’ll make sure it meets the fiber industry’s standards and that it doesn’t have any undesirable characteristics. For example, we’ll rule out those with high levels of pigment or low specific gravity.”

Are hybrid poplars economically viable for Minnesota farmers? “One of the problems with a crop you won’t receive a return on for 10 to 15 years is cash flow, return on investment,” Wene says. “But as trends are, with improving yields and increased wood prices, the prospects are looking better all the time.”

Over the past 12 years, about 20,000 poplar acres have been planted in Minnesota, mostly by private landowners with cost sharing from the federal Conservation Reserve Program.

“There are hurdles to overcome,” Wene concludes. “It’s certainly not suitable for everybody because of the up-front cost investment and the location of present markets. Trees grown close to a market will have a higher selling price due to transportation costs.” A site’s yield potential is also an important consideration, Wene says.

“For it to be a widespread alternative crop, it would help to have a government or industry program available to farmers for deferring at least a portion of up-front costs.” ■

Fixing problems, affixing labels

AURI’s food lab teaches clients how to refine and expand retail products

A candy maker doesn’t understand why the oil separates in her fudge. A Mexican foods manufacturer is troubled by cracking tortillas and watery burrito fillings. A lamb co-op making Indian-style entrees doesn’t know where to buy 100 pounds of turmeric. Who do they turn to? Charan Wadhawan, AURI food scientist in Crookston.

“Troubleshooting takes quite a bit of my time,” Wadhawan says. “A lot of people call with problems. I make suggestions on what to

do without compromising the quality of their product.”

Wadhawan says entrepreneurs often “don’t know what to do and where to go, so they come to the lab.” To help entrepreneurs understand what they’re getting into, she has them do their own lab work “and I help. It’s a basic lesson, so that in the future, when they expand their product line, they know how to go about it.

“They’ll know how we made their product high-fiber or high-protein, why we replaced one ingredient with another, why we included an additive. They learn quite a bit in the process ... and they know if they have problems, they can call me.”

Wadhawan has helped design French Meadow Bakery breads, packed them with touted medicinal ingredients — flaxseeds, spelt, amaranth, soy protein, pumpkinseeds, quinoa, cranberries — and made them tasty. She has analyzed the breads for texture, appearance and nutrition, and calculated nutritional information.

Wadhawan also aided a young woman commercializing her mom’s recipe into Angelica’s Garden Zucchini Relish. Wadhawan standardized the recipe so the product would be identical each time it was made, then scaled it up for mass production. She gave packaging advice, conducted taste tests,

sourced ingredients, tested shelf life and ensured compliance with FDA labeling requirements.

Labeling is one of the most essential services she provides. A spaghetti sauce label with sumptuous-looking peppers and tomatoes may stand out from the crowd, but it’s the plain-Jane “Nutrition Facts” label on back that allows it on the grocery shelf.

The FDA is fussy about ingredient lists, standardized serving sizes, nutritional information such as protein, fiber and carbohydrate grams, and Required Daily Allowances of vitamins and minerals. For a start-up company, meeting these requirements can be expensive; every ingredient needs to be analyzed.

As a service to clients, Wadhawan keys recipes into a software program that analyzes more than 20,000 ingredients. Certain processes and unusual ingredients may require lab analysis as well. After all the data is in, the program produces a camera-ready nutritional label at no cost to the client.

“When clients are successful, it’s rewarding,” says Wadhawan, who recently saw bread mixes she helped formulate in a Connecticut shopping mall. “It makes you feel good.” ■



AURI scientist Charan Wadhawan (right) worked with French Meadow Bakery owner Lynn Gordon to develop nutrient-rich breads.



Using it all

AURI's coproducts utilization program turns former waste into the stuff of value

Jack Johnson and Al Doering know how to use leftovers. Turning vegetable peels into fertilizer, wood fibers into mulch, and cow manure into electricity are just a few of their specialties.

Johnson is engineering director and Doering a technical service specialist at AURI's coproducts utilization program in Waseca, which includes a laboratory and pilot plant. Originally called the waste utilization program, the name now reflects a commitment to using all the byproducts of production and processing. "It is no longer the mentality that you make one product and throw everything else out — it all has value," Johnson says.

The staff get requests from entrepreneurs, businesses and ag groups wanting to take advantage of the plant's mixers, extruder, dryer, pellet mill and grader. Demand is so high they have had to turn down requests. "We have 12 active projects in full-scale product or process development," Johnson says. He and Doering are named on two patents and have three more pending.

Not all projects focus on byproducts — a few use raw commodities. For example, the Waseca technical staff helped Pet Care Systems in Detroit Lakes, Minn., redesign its wheat-based cat litter to clump better, produce less dust and work in automatic litter boxes. They refined and validated the product and are listed as inventors on the new patent.

Projects involve horticultural products, livestock feed and renewable energy, Johnson says. He and Doering typically make test products, analyze them, change formulations and do trial runs in the pilot plant. They produce reports for clients detailing analysis results and remaining issues to be addressed.

The most exciting area right now is renewable energy, consuming "40 to 50 percent of our time," Johnson says. The Waseca staff work on generating power from solids such as cow waste for electricity and ag processing waste for heating fuel.

For example, Minnesota "leads the country in corn stoves," Johnson says. "There are three to four manufacturers currently and several emerging." As an alternative to corn, "we've been blending and pelletizing coproducts." The applications range from home heating to major industrial use.

One project involves Hill Wood Products in Cook, Minn., which burns sawdust to provide energy for U.S. Steel (see story page 15). "Iron mines have been using wood fuels for years but as wood is coming into short supply, we're bringing ag crop residues into the mix," says Johnson, who has been characterizing the Btu content of various ag materials. "Ag residues could be used in place of wood or natural gas or propane; it's cleaner than coal."

The Waseca staff has spent considerable time investigating anaerobic digesters, which turn methane from cow manure into electricity. They're speaking at energy seminars around the state on the digesters' potential to power communities. They were also involved in bringing a 50-megawatt poultry litter power plant to central Minnesota.

Future coproduct uses that could reap substantial profits include medicinal nutrients from soybean hulls and specialized sugars and proteins from pulp waste.



Al Doering uses an infrared gauge to check the temperature of pellets coming out of a mill at AURI's coproducts utilization pilot plant in Waseca. Waste materials such as stems, leaves, hulls, vegetable scraps, and wood fiber are turned into high-value pellets that are burned for energy or used in fertilizers and feeds.

While AURI-funded projects are always accompanied by technical assistance, about half of Johnson's and Doering's projects receive technical assistance alone. The team prefers to help medium and small companies, but large companies can offer opportunities to utilize high quantities of byproducts.

"The most satisfying part of the job is to assist companies and businesses working with rural Minnesota, the lifeblood of our state, and seeing them be successful — a feed mix in a bag or ag commodities turned into fuels. ... What we're offering are things we can do best." ■



Jack Johnson monitors tanks containing manure gases that have been used to test various ag-based hog odor treatments at AURI's Waseca laboratory.

Full-fat versatility

AURI's fats and oils lab modifies chemical components for improved product performance

Forget the fat-free craze. Max Norris likes fats and he likes oils. Not only are they essential to our diets (who hasn't heard of Omega-3s?), they can be refined into fuel, cosmetics, industrial lubricants, even candles.

Norris, who heads AURI's fats and oils laboratory in Marshall, works with staff chemists Rose Patzer and Jerry Crawford to make businesses' and ag groups' product ideas work.

In the lab, the chemists break animal fat- or vegetable oil-based products down into their components, then examine and improve them. "If you're trying to simulate a product, Jerry will analyze it and give you targets. Once you've developed a product, he tells you what you have — all the details that characterize the ingredients," Norris says. "If you find it doesn't work so well, he'll tweak it."

Some development work can take years, such as Norris' involvement with biodiesel. AURI-backed research "started in the early 1990s

with a vision we could get where we are today. We have arrived." Since the state legislature mandated a two-percent biodiesel blend, "the phone has been ringing off the hook. Everyone wants to build a biodiesel plant in their community. ... (This) positioned Minnesota to be a leader in this technology."

Norris hopes a similar long-term effort will pay off for SoyMor, a 500-member grower group that wants to extract high-value ingredients from soybeans. "Within every bushel of soybeans, there's a possible \$16.86 worth of product — oil, meal, fiber, carbohydrates."

The value goes even higher by "removing gums, commonly called lecithin, and other fat derivatives." Lecithin can be fractionated into five phosphorous-containing components, including phosphatidyl serine, claimed to improve brain function. "Lecithin components are in the marketplace — but they're imported and sell for several hundred dollars per kilogram — high end stuff," Norris says.

The most important asset of any new product venture, even a small one, is "that it differentiate itself in the market," Norris says. He's seen soy oil-based handmade soaps "with 25 cents worth of material" sell for \$3 apiece.

Some successes catch even AURI staff by surprise. Jill Anderson of Redwood Falls, who started making fragranced soy oil candles for local shops and farmers markets, "now has a business that has moved into the millions with 33 employees," Norris says.

Crawford and Norris helped Anderson



AURI's fats and oils laboratory in Marshall, staffed by (from left) chemist Jerry Crawford, senior scientist Max Norris and chemist Rose Patzer, analyzes and helps develop diverse products such as biodiesel, soy oil-based candles and lecithin that can be fractionated into high-end medicinal supplements.

improve her product with hydrogenated oils for increased burn time. They pointed out benefits she could market. "(Soy oil) doesn't have the sootiness that messes up containers and walls, typical of paraffin-based materials," Norris says. AURI also sourced equipment so Anderson could upgrade "from pouring one candle at a time." Within two years Anderson moved from her basement beginnings into a 12,000 square-foot building

and is selling candles in 1,000 retail stores.

Why are some projects successful? "I think it's the people who have something with a market desire. You have to be a little bit different, and people will (pay) more," Norris says. Mostly, "it's being in the right place at the right time." ■

A meat maker's dream

AURI's meat pilot plant can turn out test products in record time

Leave out the flowers and homemade baskets, and AURI's meat pilot plant in Marshall might pass for Martha Stewart's dream kitchen. Just about any meat product can be made here — links, patties, roasts, breaded cutlets and smoked meats.

The facility is available to small processors who want to design and evaluate prototypes before contracting with commercial processors or investing in equipment. Even larger processors, who can't spare equipment for product trials, seek help from AURI's meat lab staff.

Manager Darrell Bartholomew, a meat scientist, has helped design countless products over almost a decade at AURI — zesty ethnic sausages, cashew-coated chicken nuggets, rib-shaped dog treats, barbecue ribs and nitrite-free bacon. Assisted by meat technologist Brian Reuter and lab technician Karen Fennern, he helps clients at any development stage, from raw meat to packaged product to taste panels.

Cutting tables, saws, a slicer, patty machine, emulsifier, sausage-making equipment, ham tumblers, a steam-jacketed kettle, smokehouse, breading machine, multi-needle injector, packing equipment, coolers and a freezer fill the 2,000 square-foot facility located on the Southwest State University campus. An adjoining microbial lab is used for environmental monitoring and shelf-life tests. Lab technicians do color and tenderness evaluations and train processors in safe food handling, including the HACCP, or Hazard Analysis and Critical Control Points program.

"We have processing technologies available that (clients) might not have been aware of," Bartholomew says. For example, traditional ham takes about a week to cure; the Marshall plant does it in a day. An injector punctures the meat, then a vacuum tumbler evenly distributes the curing brine through the meat. After seven to 12 hours in the smokehouse, the ham is ready.

Frankfurters are among the most popular products at the lab. The process starts with the circular cutting blades of a large emulsifier. Next, sausage linkers measure and pump the pureed meat into casings. One makes old-fashioned wieners priced after they're weighed; the other makes hot dogs all the same weight and length — about 500 per minute.

In the smokehouse room, a sausage peeler removes cellulose casings from franks — 200 in 8 to 10 seconds. Products are cooked or dried slowly — up to 800 pounds at a time. "The smokehouse needs constant attention to obtain a desirable surface color and avoid case hardening," Bartholomew says.

Processors who train in HACCP methods learn how processing mistakes cause contamination. Even when working with a contract processor, a meat business must identify proper cooking temperatures and other critical control points. Processors learn to use equipment such as a bioluminometer, which costs about \$3,000 and uses a firefly enzyme to convert ATP energy, found in all living cells, to light. Bartholomew swipes a test swab on equipment or packaged meat surfaces and inserts it into the bioluminometer. In about 11 seconds, he can determine if equipment surfaces are free of microbial or meat and plant residue contamination.



Meat scientist Darrell Bartholomew (on left), lab technician Karen Fennern and meat technologist Brian Reuter help clients develop new products at AURI's meat pilot plant in Marshall.

"Overcoming problems and making successful new products," Bartholomew says, are the most rewarding parts of his job, along with "seeing a client's product in the marketplace, and seeing the company grow." ■

BY E. M. MORRISON

Morris, Minn. — A Minnesota ethanol company is making a new energy product, but it's for cows, not cars.

Golden Lyk, a subsidiary of Diversified Energy Company (DENCO), is turning ethanol byproducts into high-energy protein lick-blocks for cattle. Golden Lyk Tubs are made from wet and dry corn distillers grains, solubles and minerals. The lick-blocks are a new use for wet distillers grain and a good example of how Minnesota ethanol companies are adding revenues with coproducts.

Distillers grain glut

The DENCO ethanol plant in Morris processes 7.5 million bushels of corn a year, producing 20 million gallons of ethanol and more than 80,000 tons of distillers grain.

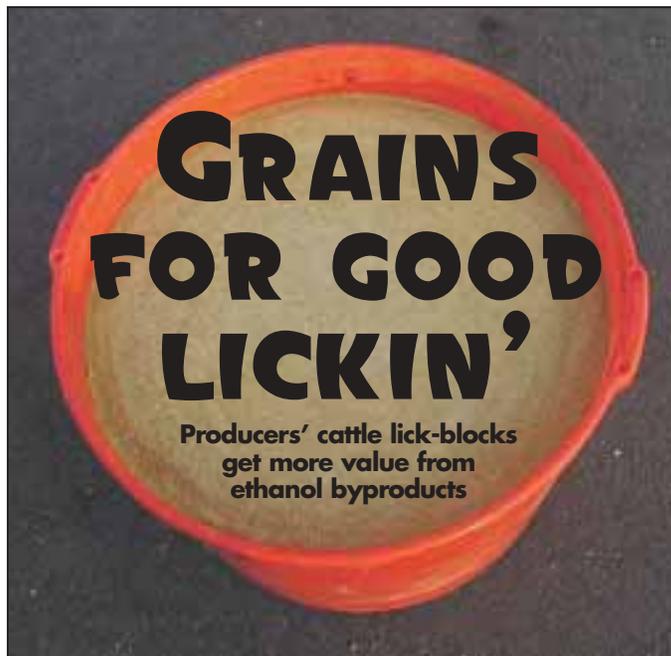
Distillers grain is the corn fraction remaining after the starch has been converted to ethanol. About 30 percent protein, it is sold both wet and dry as livestock feed. Distillers grain has become an important income source for Minnesota's ethanol plants. At DENCO, for example, feed sales represent about 15 percent of the company's \$29 million in annual revenues, says Controller Jim Highum.

But as Minnesota's ethanol industry expands, Highum says, there will be a whole lot of distillers grain for sale. That's likely to create a market glut, depressing the feed's value. So "everybody is looking for another way to use these coproducts."

Patented gold

Dry corn distillers grain has been used for years in livestock lick-blocks. DENCO General Manager Gerald Bachmeier, who also raises cattle, had used protein blocks on his North Dakota farm. It was his idea to make them from wet distillers grain.

Early last year, AURI helped DENCO assess



the market potential of protein blocks, a \$150 million industry in the Upper Midwest. Supported by a \$145,000 USDA research grant, DENCO began experimenting with formulas and manufacturing methods. By late summer 2001, the company patented a process that turns "wet cake" and other ingredients into solid, 200-pound lick-blocks in recyclable plastic tubs.

The pale gold lick-blocks are a total cattle supplement, containing 12 percent plant protein plus a guaranteed analysis of fat, fiber and minerals, says Duane Rixe, DENCO feed sales manager. "You can get higher protein in

competing products, but our tub is not just a protein supplement; it is a total supplement tub high in energy, vitamins and minerals." Golden Lyk makes custom-blended tubs for special nutrition needs, too.

After testing Golden Lyk Tubs last fall on 16 Midwest farms and ranches, DENCO began manufacturing in January. The tubs are available at DENCO and are distributed by Vigortone, a livestock nutrition company based in Cedar Rapids, Iowa.

Golden Lyk boosts the value of DENCO's distillers grain about 20 percent, Highum says. He expects Golden Lyk to sell about 100,000

tubs this year. And the outlook for growth is good, he adds, as farmers look for cheaper and more convenient ways to deliver feed and supplements to pastured and grazed cows.

Half dozen new uses

DENCO's venture is part of an industry-wide emphasis on getting more value from ethanol coproducts, says AURI's Michael Sparby, project development director in Morris and Crookston. AURI is working with Minnesota ethanol producers on a half-dozen new uses for distillers grain, including fertilizer, special feeds and alternative fuels.

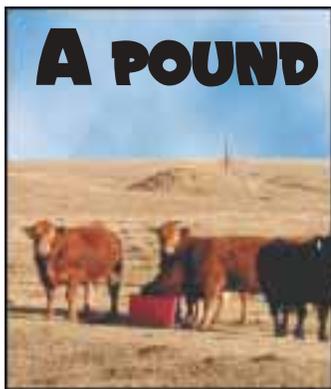
In addition, ethanol producers are paying more attention to the quality and consistency of their coproducts, says Scott Anderson, a cattle producer and feed dealer in Langford, S.D. "We move a lot of ethanol byproducts for feed," says Anderson, who also sells Golden Lyk Tubs. "Morris has a very consistent feed coming out of the plant."

Rixe agrees. In the past, he says, the ethanol industry "didn't look at these byproducts as something valuable that has to be consistent and high quality. That's changed." ■

AURI at work

AURI assistance provided to Golden Lyk includes:

- Market research and assessment
- Technical assistance for manufacturing expansion



A POUND A HEAD GOLDEN LYK TUBS PROVE THEMSELVES TO COW HERDERS

BY E. M. MORRISON

Al Schoenfeld is an animal nutrition expert and farmer who runs a 170-cow-calf operation in Deuel County, S.D. He's one of 16 cattle producers across eight states who tested Golden Lyk Tubs last fall.

Schoenfeld fed Golden Lyk to 35 cows on grass pasture and 170 on grass hay. Both groups consumed 1 to 1-1/4 pounds of supplement per head per day, at a cost of about 22 cents a day, he says.

"The tubs worked very well," providing easily digestible protein and energy, says Schoenfeld, a consultant for Vigortone and a specialist in cow-calf nutrition.

Scott Anderson, a cattle producer and livestock feed dealer in Marshall County, S.D., had similar results with a group of 50 cows fed on hay. "They ate about a pound per head per day — exactly the predicted rate."

But a comparison group of cows receiving high-quality mixed

rations barely touched the tubs, Anderson says. He concluded, "if the cows need the supplement, they eat it. If not, they leave it alone." That's a contrast to sweeter, molasses-based lick-blocks, which cattle tend to over-consume, he says.

Schoenfeld fed his cows Golden Lyk Tubs again this spring during breeding, to provide extra energy. "If it's a dry summer and we have reduced-quality grass, we'll look at using them this summer, too." He says the lick-blocks are more

convenient to feed than supplemental corn and require less monitoring. "I was impressed with the product's ability to withstand the weather. The tubs were rained on, snowed on. The cows just licked off the snow."

The cost of feeding Golden Lyk Tubs averages 18 to 25 cents per head per day, says Duane Rixe of Golden Lyk. "That's competitive with other methods of supplemental feeding," Schoenfeld says. ■

Farm locally, sell globally

Minnesota companies can sell globally with the help of international trade organizations

BY DAN LEMKE

St. Paul, Minn. — In a typical week, Paul Hansen may field questions from Minnesota producers on organic potatoes, soybeans, livestock feed, dairy products, poultry processing and ethanol. The callers are not concerned with raising or manufacturing those products; they want to learn about exporting them.

As an international trade representative for the Minnesota Trade Office, Hansen works with agribusiness to develop trade with other countries. He doesn't mind the calls. "We like to be used," he says.

With about 95 percent of the world's population outside the United States, the trade efforts of businesses large and small have begun to be directed internationally. Some cooperatives and grower groups have also set foot in foreign markets, such as Earthwise Foods of northwest Minnesota.

Crookston farmer and Earthwise member Curt Petrich says the co-op has had some success shipping organic and identity-preserved soybeans, wheat and flax to Japan, Europe and South Korea. "If you are doing things right for customers here, maybe you can do it right somewhere else, too," Petrich says.

Ought to be committed

Heading beyond the borders requires commitment and planning, Hansen says. Businesses just starting out are not typically in a position to think globally. They should focus on building solid business in this country first.

"When selling internationally, one of the first questions you are likely to get is, 'How are you doing in the U.S.?' If you can describe an impressive U.S. market share or list well-known companies as buyers or give other examples of your success, your export selling will be much easier," Hansen says.

"For people who are serious about doing business internationally, it's a process of becoming knowledgeable. It's usually done in degrees."

Jeffrey Phillips, a trade office representative working with processed food companies, says a company's commitment to pursuing foreign markets is essential, but there are many small companies that have taken the plunge successfully.

Phillips says, "97 percent of exporters are small companies. Businesses of 20 employees and under are the fastest growing exporters."



PHOTO BY JEFF FREY

"It's more the attitude than the size," adds Ryan Kanne, international trade specialist with the U.S. Commercial Service. "Being international takes resources of people, time and money. It can be large companies or it can be small. It depends on their strategy and the view of their market."

While most AURI-supported businesses target domestic markets, several have ventured into international waters.

"Identity-preserved grains and exporting are excellent means of adding value to crops," says Michael Sparby, AURI project director. "But I would caution those interested to use all the resources available to them before starting. It can make the difference on whether something is viable or not." AURI has provided technical support to prepare some crops for export.

Where in the world

Canada, Japan, Britain and Germany are among this country's top trading partners. While trade relations have been established, each country has unique considerations, and doing business overseas is not like doing business down the street.

"Japan is a consistently large importer of Minnesota ag products," Hansen says. "But before you make your first sale, there can be a long courtship — emphasizing the need for commitment."

"Canada has very similar tastes to the U.S.," Phillips adds. "If you are looking at Mexico, Europe or Asia, you have to consider things like flavor, their tastes, packaging preferences,

package sizes. It's a resource commitment. You have to research the market."

While Minnesota producers do export finished products, they are currently large suppliers of processed ingredients. Phillips says Minnesota exporters are finding buyers for ingredients such as dry dairy products and eggs, flour, oils and dried vegetables.

Wearing white hats

A large portion of the Minnesota Trade Office's 10th floor office is taken up by its international resource center. To most, books with titles like "International Marketing Data and Statistics" and "World Guide to Trade Associations" are nothing more than cures for insomnia. But the center's online and print resources offer businesses access to valuable information on foreign markets, trends and key contacts.

"We get a lot of calls," says Liz Wade, research specialist. "People are looking for things like 'who's buying, who's importing.' We give ... access to those things and we help them find answers."

We have market research databases and subscriptions that some businesses couldn't afford on their own or wouldn't want to take the time to learn to use."

While foreign trade is imposing, Minnesota businesses have considerable resources on their side. (See "Ag Web Sites" on page 14.) In addition to its extensive resource center, the Minnesota Trade Office employs specialists and offers education to help businesses become familiar with countries they are trying to enter. MTO also organizes trade tours to bring Minnesota businesses and trade reps in contact with potential buyers.

Phillips is Minnesota's representative to the Mid-America International Agri-Trade Council, a nonprofit organization promoting Midwest food and ag exports. Other resources include the Foreign Agriculture Service, the U.S. Commercial Service and the Minnesota Department of Agriculture. These services assist in dealing with lingual and cultural barriers, connecting with brokers and distributors, and getting paid.

While international trade does present opportunities for Minnesota enterprises, Hansen says it is vital not to forget customers close to home. "We're sitting on top of a large market domestically," he advises. "And you don't have to worry about translation." ■

Exporting Resources

A wealth of information is available to businesses interested in exporting agricultural products. The four most prominent:

Minnesota Trade Office

The Minnesota Trade Office provides industry and market specialists, trade tours, trade shows, a resource library and export-related educational programs. Representatives are well versed in trade with various countries or regions of the world.

Minnesota Trade Office
1000 Minnesota World Trade Center
30 East 7th Street
St. Paul, MN 55101-4902
(651) 297-4222 or (800) 657-3858
www.exporthtminnesota.com

MIATCO

The Mid-America International Agri-Trade Council is comprised of 12 Midwestern state agricultural agencies that use federal, state and industrial sources to promote food and ag product exports. MIATCO offers programs to support buyer missions and market studies as well as one that helps offset marketing costs.

MIATCO
400 West Erie Street, Suite 100
Chicago, IL 60610
(312) 944-3030

In Minnesota, contact Jeffrey Phillips of the Minnesota Trade Office at (651) 297-8841.

U.S. Commercial Service

The U.S. Commercial Service, part of the U.S. Department of Commerce, assists manufacturing and service companies with exports. With 106 offices in the United States and 160 offices in 89 other countries, it can identify buyers, provide market information and assist companies in other areas.

U.S. & Foreign Commercial Service
U.S. Export Assistance Center
Plaza VII, Suite 2240
45 South 7th Street
Minneapolis, MN 55402
(612) 348-1638

Foreign Agricultural Service

The USDA Foreign Agricultural Service is a one-stop shop, offering trade leads, buyer lists and transportation links. With attachés in 65 countries, the FAS can connect exporters to many of the most promising foreign markets.

www.fas.usda.gov

Rising from the grasses

A family creamery springs up in New Prague

STORY AND PHOTOS BY JENNIFER PENA

New Prague, Minn. — Sometimes little things make the biggest differences. For Dave and Florence Minar, it was letting their cows eat grass.

That grass-fed beginning led to an on-farm creamery producing dairy products high in Omega-3s, Omega-6, and Omega-3. This spring, their Cedar Summit Farm brand became available in Twin Cities health food stores and a St. Peter co-op.

Summit of three generations

Cedar Summit Farm has been in the Minar family since the 1920s, when Dave's grandfather purchased it. His parents took over in the '30s, and finally he and Florence purchased it in 1969. The three-generation family business has developed a loyal customer group and keeps growing by word of mouth.

It wasn't until 1993 or '94 that the Minars' cows started on grass rather than corn and grains, but Florence says it made a noticeable difference. Outdoor exercise makes their cows healthier, which has dramatically cut vet bills. Healthier animals produce healthier milk, she maintains. "We have very happy cows now," adds the Minars' daughter Laura. "They spread out all over the pasture because they have so much to eat."

To give the cows shelter from Minnesota winters, the Minars put up a hoop house last fall. The house has a fabric cover that lets in sun while it keeps the cows warm.

Around the time they began pasturing cows, the Minars took to direct marketing chicken, beef and pork. That's when Florence began researching Omega-3s and passing out articles about it. "I realized we had a superior product because of the Omega-3 in it, and I wanted people to know about it," she says.

Everyone needs a dietary balance of Omega-3 and Omega-6 oils. Omega-3, contained in green vegetables and the grass cows eat, is an essential fatty acid that promotes lean muscle

mass, helps fight cancer and helps convert fat to energy. Omega-6, another essential fatty acid, is in many seed oils, but too much of it can possibly cause immune system problems, make the body store fat and promote tumors, say some researchers. Florence says Americans have twenty times more Omega-6 than Omega-3 in their diets today, but research indicates it is best to eat only three times more Omega-6 than Omega-3. "I don't feel as much like a radical as I did before because more people are finding out about (Omega-3s) now," she says.

Zoned out

Although the farm was thriving and expanding, the Minars did not have smooth sailing. Located in an "agriculture zone," they had to get a

conditional use permit for their business from Scott County. The permit restricted retailing, so the Minars call their store a "showroom."

The farm appears to be doing well with or without advertising. They have regular customers who come in at least once or twice a week, and Florence says they get about two to three new customers a day. She thinks loyal customers are spreading the word because "people like to know where their food comes from.

With all the *E. coli* scares everywhere, a product like ours makes a difference." She says that every time there is an outbreak of *E. coli*, the farm gets phone calls and product requests. "Last year we ran out of ground beef because of an *E. coli* scare. People were stocking up on boxes of ground beef and got kind of panicked."

Roller coaster to creamery

When their parents began talking about developing a dairy processing facility on site, sons Mike, Dan and Chris, daughters Laura and Lisa and their spouses were all enthusiastic. "They wanted to be a part of it," Florence says. She and Dave began checking



Dave and Florence Minar say their dairy products are high in Omega-3 essential fatty acids because their cows are grass fed. Recently the Minars opened an on-farm creamery where they produce Cedar Summit Farm milk, butter, yogurt, ice cream and cheese.

around to determine how to build a creamery of their own. "It was a roller coaster ride," laughs Florence. "One day we'd be excited, the next we'd be saying, 'Oh my gosh.'"

Lisa Gjersvik, project development director in Waseca, has been working with the Minars since September 2001.

"The Minars did things right," she says. "They had an idea for a product that's differentiated in the marketplace, but they knew that was only part of the equation. They knew they needed to determine whether their products' attributes were valued by consumers." The Minars took the time to do the homework on the front end and went in with their eyes open. "Planning in the beginning pays long-term dividends."

Now in their fourth month of processing, the family is finding out what works and what doesn't. All five of the Minar children help out as much as possible, and that includes spouses. While the family runs the creamery, their dairy farm partner Paul Kajer manages the livestock and two part-time employees help in the barns. "Dave and I just fill in wherever we're needed," Florence says. "At least one of us has to be around the bottle washer to keep it going during the day too."

Something for everyone

Cedar Summit dairy offers a wide variety of products: regular, chocolate and strawberry milk, butter, yogurt, ice cream, cheese, chicken, beef, pork and turkey at Thanksgiving. "We sell pretty much all of our turkeys every year," Florence says. "We have a waiting list from people who sign up to be assured they get a turkey next year."

In addition to Cedar Summit's showroom sales, and New Prague and Twin Cities markets, Laura home delivers within a 10-mile radius of New Prague. The Minars are considering a possible venture into the St. Paul Farmers Market, which would be a "big commitment," Florence says.

For the cows, there is freedom and that luscious grass. "It was really funny watching the cows recently," says Florence. "We milk them two times a day and after each milking they get fresh grass. One day they went running out to the pasture because they knew what they were getting. They love it." ■

For more information, visit www.cedarsummit.com or call (952) 758-6886.



SEED MONEY

APHID ALERT ENRICHES POTATO PRODUCERS IN NORTHERN MINNESOTA



PHOTO BY ROLF HAGBERG

BY GREG BOOTH

Crookston, Minn. — Keeping a close watch on a costly potato pest has saved growers up to \$6 million so far, says Duane Maatz of the Northern Plains Potato Growers.

Basic changes in field practices are all it takes to decrease insecticide use, increase yields and save money, Maatz says. Virtually all seed potato producers in the Red River Valley region have adopted changes recommended by an AURI-funded aphid study.

As part of AURI's Pesticide Reductions Options, a \$200,000-per-year research and demonstration program, the "Aphid Alert" program for potato growers is "very valuable," Maatz says. "It's one of the best seed growers can use to minimize exposure to virus infection."

Researchers found that green peach aphids, which carry a virus to potato leaves, usually land on the perimeter of potato fields. By monitoring aphids caught in traps, growers can determine the right time to spray insecticide.

Early results show that by targeting insecticides to specific areas and times, growers can reduce the amount and frequency of pesticide applications. An added benefit is that aphids' natural enemies aren't harmed, so subsequent aphid outbreaks can be more naturally contained.

Studies in 1999 and 2000 indicated first applications could be reduced by as much as

85 percent. Although severe weather hampered aphid research in 2001, new PRO trials are underway for 2002.

Once preliminary results were out, seed producers adopted the new methods almost immediately, Maatz says, saving the approximately 100 producers about \$6 million

over the past two years in insecticide and application costs. Producers pay about \$23 per acre for aphid pesticide application.

If a seed crop is infected with potato virus, Maatz says the resulting crops are less valuable, especially for products such as french fries. Affected potatoes fry up darker and are less desirable to the food industry. The region's growers have North America's highest standards for seed potatoes; only a half percent show signs of viral infection, Maatz says.

More seed potatoes passing winter certification trials in 1999 and 2000 translated into \$920,000 additional income for producers, reports Maatz and project investigators Edward Radcliffe, David Ragsdale and Ian MacRae.

Early recommendations also "show potato farmers can do basic field production practices, like changes in planting dates and changes in the kill dates of (potato) vines, to save an awful lot of money on insecticides," Maatz said. "All the seed growers are following (the recommendations). They're very much in tune with what's going on in their fields." ■

PRO PEEKS

AURI'S PESTICIDE REDUCTION OPTIONS PROGRAM CONTINUES TO FUND PROMISING PROJECTS

BY GREG BOOTH

Looking for ways to reduce on-farm pesticide applications, AURI's PRO grant recipients will continue work begun in 2001 on a variety of agricultural products, including barley, pumpkins, bees, greenhouse plants and indoor vegetation.

Beetles in pumpkins

New organic pest management system for cucumber beetle in pumpkins and squash

Sponsored by the Minnesota Fruit and Vegetable Growers Association,

this project evaluates baited traps to control pests in crops such as pumpkins, squash and cucumbers. These crops have a value of \$7 million annually, according to USDA. Researchers are comparing trap placement strategies, and sharing data with growers through media such as the Minnesota Vegetable IPM newsletter. Early results indicate the most effective placement of traps is 50 to 100 feet from a field's edge.

Bees that resist

Honey bee resistance to diseases and the parasitic mite, *Varroa destructor*

Pesticides and antibiotics are commonly used to fight mites and disease in honeybee colonies. Researchers are attempting to reduce pesticides and antibiotics by breeding mite- and disease-resistant bee lines. Resistant lines were

crossbred and the resulting colonies will be studied this year. Researchers will also look at honey production, colony strength and temperament (how much they sting). The Minnesota Honey Producers Association is the project sponsor.

Greenhouse gnats

Integrated pest management of fungus gnats *Bradysia* spp. in commercial greenhouses

The fungus gnat is a common greenhouse pest. Effective, timesaving ways to monitor the gnat is one focus of this study. Traps used are potato disks, fava beans, geranium transplants and sticky cards.

A second focus is to find soil mixes that help reduce fungus gnats. Researchers are also evaluating lower-risk, targeted pesticides so

growers can be less dependent on broad-spectrum pesticides. Research is being conducted at the University of Minnesota plant pathology greenhouses and Dan & Jerry's Greenhouses in Monticello and Buffalo, Minn.

Breeding against leaf blotch

Resistance of barley germplasm to septoria speckled leaf blotch
Septoria speckled leaf blotch is one of the most devastating barley diseases. This project, sponsored by the Minnesota Barley Research and Promotion Council, is breeding resistant barley varieties. First-year studies showed that three lines of tested barley were resistant to SSLB; two were moderately resistant. Another two lines were found moderately susceptible to the disease, and the remaining lines tested were susceptible. More

information gathered this year will help to commercialize resistant seed.

Save the lady bugs

Implementation of biological control and compatible pesticides in Minnesota

Valuable trees and plants inside public places such as Camp Snoddy and Como Conservatory need protection from pests — and people visiting them need protection from pesticides. This project's early results show a common pesticide thought to be safe actually kills beneficial lady beetles. Researchers hope to replace it with less toxic pesticides. The Minnesota Landscape and Nursery Association is sponsoring the project. ■

Elsewhere in ag utilization

BY JOAN OLSON

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

Life after latex

Guayule, a shrub found in southwestern United States, yields high quality, hypoallergenic latex. The latex extraction process, however, yields huge amounts of ground stems and leaves in a brownish-white slurry called bagasse.

USDA-ARS and Forest Service scientists have found that composite particleboard from bagasse and recycled plastic resists attack by termites and wood-rot microbes. In addition, guayule resin, when properly incorporated into wood, may be an effective natural preservative for wooden buildings, boats, decks and outdoor furniture.

Source: *Agricultural Research*, April 2002. Contact: Francis S. Nakayama, USDA-ARS, Phoenix, AZ, (602) 437-1702, Ext. 255, fnakayama@uswcl.ars.ag.gov

Rice straw packs

Environmentally friendly packaging can be made in part from rice or wheat straw. ARS scientists are working with Regale Corporation in Napa, Calif. to discover ways to reduce processing costs.

The molded polystyrene forms that hold electronic components snugly in their shipping cartons, for example, could be replaced with biodegradable inserts made partly from straw fiber.

Source: USDA-ARS, William Orts, Albany, CA, (510) 559-5730, ortspw.usda.gov

Edible wraps win award

Edible fruit- and vegetable-based food wraps have garnered a national award for ARS food scientist Tara H. McHugh. *Popular Science* magazine chose McHugh's work as one of the magazine's 100 "Best of What's New" awards for 2001.

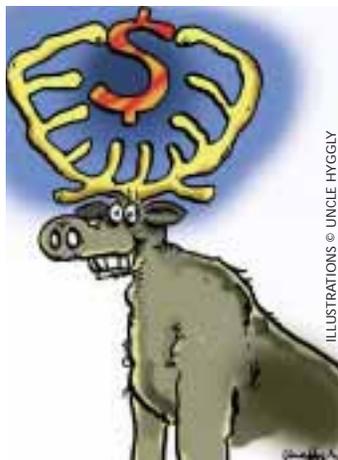
Source: *Popular Science*, December 2001.

Bargain biodiesel

ARS scientists have developed biodiesel from soy soapstock, an abundant but under-utilized byproduct of soy oil refining. Their patented process uses low-value, less-pure lipids, which can cost as little as one-tenth the price of refined vegetable oils.

The new biodiesel's composition, engine performance and emissions are comparable to the biodiesel from refined soy oil now on the market.

Source: *Agricultural Research*, April 2002.



ILLUSTRATIONS © UNCLE HYGGLY

Antlers in demand

Alberta rancher Don Bamber has built a second plant on his elk ranch to process antler powder into health products. Demand for his elk-antler powder, sold in bulk or capsules, has been growing. He bottles and packages elk-antler powder for 97 companies. Besides human consumption, new markets are developing for horses and pets.

Source: *The Furrow*, Spring 2002

Zeroing in on zein

ARS researchers have developed a cheaper process to extract zein, a valuable protein, from corn. Zein, extracted from corn gluten, sells for about \$10 a pound.

Zein is also found in dried distillers grain, a byproduct of the dry-milling ethanol process that is often sold as a feed supplement. The researchers have made zein affordable by using ethanol as a solvent to extract zein from dry-milled corn.

Source: Leland C. Dickey, USDA-ARS, Wyndmoor, PA, (215) 233-6406, ldickey@arserrc.gov

Cotton pellets

A new process developed by ARS scientists forms cotton processing waste into pellets. Tests are underway using the pellets for heat stoves, mulch, fertilizer and animal feed.

Source: Gregory Holt, USDA-ARS, Lubbock, TX, (806) 746-5353, ext. 226.

Bean's at home here

Visitors to the 2002 Farm Science Review in London, Ohio, to be held September 17-19, will have a chance to view the "House that Soy Built." The exhibit, first established in 2000, showcases the many uses of soy-based products.

For 2002, a kitchen has been added to the living room and bathroom currently on

display. Soy products range from carpet backing, paints, cleaners, Environ biocomposite countertops and cabinetry to adhesives, posters, insulation and bath and body care products. The kitchen will also feature soy cooking techniques.

Source: *AgriMarketing*, March 2002.

Georgia goats

A new generation co-op, Sunbelt Goat Meat Cooperative, was formed as a result of a feasibility study conducted by Georgia's Center for Agribusiness and Economic Development. The study showed a 450 to 600 head-per-week processing plant would have an economic impact of \$2.6 to \$6.3 million annually. The co-op has 180 members in 71 of Georgia's counties.

Source: *Center for Agribusiness and Economic Development, University of Georgia*, (706) 542-0760, caed@agecon.uga.edu

Get the folks to the farm

A phone survey of 400 Georgians shows that some 60 percent are interested in participating in agri-tourism activities. It further showed the necessity for creating an entire package of events, such as pick-your-own produce, hayrides, and paint-your-own pumpkin.

Source: *Center for Agribusiness and Economic Development, University of Georgia*, (706) 542-0760, caed@agecon.uga.edu

Corn fuels corn

To reduce its dependence on fossil fuels, Pioneer Hi-Bred International, Inc. is trying to convert discarded corn into usable energy. In a joint effort with Iowa State University and Carbon Energy Technology, Inc., Pioneer is testing a process to convert unwanted seed corn into fuel to dry new seed corn. This could reduce the company's dependence on natural gas and utilize seed that would otherwise be discarded.

Source: *Pioneer Hi-Bred International, Courtney Chabot Dreyer*, (515) 334-4663, courtteney.dreyer@pioneer.com



Broccoli on guard

Broccoli stores selenium in a useful form that is easily converted into an active anti-cancer agent. Tests on mice fed experimental high-selenium broccoli showed it protected them against precancerous lesions in the colon and mammary tumors. Further study is needed to see if this proves true in humans.

Source: John W. Finley, Grand Forks, ND, (701) 795-8366, jfinley@gtfnrc.ars.usda.gov

The foaming soys

A bio-based spray foam insulation made from SoyOyl, a soy-based polyol, was recently introduced by Urethane Soy Systems Co. of Princeton, Ill. The company developed the insulation for use in residential and commercial buildings.

Source: *Doane's Agricultural Report*, February 8, 2002.

The U's have it

Researchers from Ohio State University, Purdue University, University of Missouri and Iowa State University are collaborating on a project to develop bio-based industrial materials using soy oil. The regional project is funded through a \$1.5 million USDA Initiative for Future Agricultural and Food Systems grant. Products that will be tested include airplane deicers, polyurethane foams and heating fuel.

Source: Steve St. Martin, Ohio State University, 614-292-8499, stmartin@osu.edu

Hay, rabbits ...

Nebraska hay grower John Miller has found a profitable niche in pet foods. His Oxbow Hay Company offers alfalfa, timothy, bromegrass, orchard grass, and oat hay in 15-ounce plastic bags for pet rabbits and other small herbivores. At nearly \$4 per bag, he grosses more than \$8,000 per ton.

Source: *The Furrow*, February 2002.



Off-road e-test

A two-year test program on ethanol-blended diesel has been launched by John Deere, the National Corn Growers Association, Renewable Fuels Association, Illinois Department of Commerce and Community Affairs, and corn growers from six states.

The project will use John Deere off-road equipment and evaluate the blend for engine durability and compatibility, emissions and safety.

Source: *Doane's Agricultural Report*, March 1, 2002.

Organics face new rules

The U.S. market for organic products has increased at least 20 percent within the past decade; economists say the trend will continue. After October 2002, all products sold as organic must be certified according to USDA National Organic Standards.

Source: Candace Pollock, Ohio State University Extension, (614) 292-3799.

ag web sites global trade

BY JENNIFER PENA

What's going on in world trade? If you're running a business, work for a business involved in foreign markets, or just want to know about exporting, we've pulled together some resources for you to check. As always, we encourage you to visit www.auri.org for what's new at AURI.



Foreign Agricultural Service

www.fas.usda.gov

The Foreign Agricultural Service is a USDA division that works to improve ag product exports. FAS is active overseas in market development, international trade agreements and negotiations, and offers statistical analysis and market information. Its site provides export information on commodities and news on U.S. and foreign markets.

Minnesota Trade Office

www.exportminnesota.com

MTO, a division of Minnesota's Department of Trade and Economic Development, promotes and assists "the expansion of exports and foreign direct investments that contribute to the growth of the Minnesota economy." The MTO Web site's many features include data on Minnesota communities and publications on tourism, international trade and economic development.

Export Assistance

www.exportassistance.com

The Export Assistance and Exporter Information site is excellent for those new to exporting and in need of beginners' education. Whether you are looking for data on Minnesota, exporting jobs, international opportunities or statistics, Export Assistance has organized it for easy use. Information is provided by the Minnesota District Export Council, a private, nonprofit organization that brings together experienced international business people who can provide guidance and assistance in international markets.

U.S. Commercial Service

www.usatrade.gov

The U.S. Commercial Service is part of the U.S. Department of Commerce. Its mission is to promote U.S. exports of goods and services, particularly by small and medium-sized businesses. This site makes export exploration easy – it offers resources and research, an international network to help find partners, updated news and a link for contacting a U.S. Commercial Service trade specialist.

Mid-America International Agri-Trade Council

www.miatco.org

Since 1969, MIATCO has been promoting Midwest food and agricultural product exports. It provides numerous services, including customized export assistance and a cost-share funding program. Industry professionals and food buyers can benefit from reading "Export 101," a user-friendly introduction to exporting. Locate U.S. product suppliers, question staff or provide feedback.

U.S. Meat Export Federation

www.usmef.org

Headquartered in Denver, the U.S. Meat Export Federation is a nonprofit trade association working to create new and develop existing international markets for U.S. beef, pork, lamb and veal. Although it specializes in meat, USMEF offers updates on markets, a supplier search option, export stats and forecasts. USMEF's site features some interesting extras, such as the "Meat Manual," a guide for identifying the most common cuts of U.S. meats. ■

the naked rib FROM PAGE 3

weekends, they are fun, too, Sterner says. "You meet a lot of people. And I love seeing their reactions. They'll stop and talk and say, 'That's good.'"

Taking time for success

Sterner, 46, says the long hours that go into a new venture can be "tough on family life." He has been in business for himself since he was 22, founding and selling several companies. He grew up in Winsted and Waverly, trained as a professional chef, then ran a nursery and later a landscaping company before returning to the food business. "In a way, I'm back where I started."

Conroy, 55, also trained as a chef. He grew up in Wheaton, working briefly in the restaurant business before making a career in institutional food sales. He agrees that time is a big challenge in starting a business: "Gary and I were putting in 18-plus hours a day at first." That's gotten better, he says, though there are still plenty of six- and seven-day workweeks.

But deBarbeque sales are ahead of projections, Conroy says. "And I've never had more fun in my life." ■

AURI at work

Services AURI provided deBarbeque include:

- Recipe development, testing and scale-up
- Shelf-life tests
- HAACP training
- Nutrition facts and labeling



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CHOP WOOD, MAKE STEEL

HILL WOOD PRODUCTS EXPANDS ITS RENEWABLE FUEL BASE TO SERVE US STEEL

BY GREG BOOTH

Cook, Minn. — Minnesota forestry and agricultural industries are helping the state's steel industry process taconite.

As an alternative to oil, natural gas and coal, Hill Wood Products produces dry solid fuel from wood byproducts. The fuel is used to fire taconite pellets at US Steel's Minntac plant in Mountain Iron, Minn.

Increasing demand for the fuel, now competitive due to rising natural gas prices, has led Hill Wood to a promising new source of fuel material: ag byproducts.

EXPANDING FUEL

Last year, Hill completed a major expansion of its Minntac fuel facility, says owner Steve Hill.

As large consumers of energy, steel producers look for the lowest fuel prices, and Hill Wood's Iron Range location reduces fuel delivery costs for US Steel. "We're more than competitive with natural gas today," Hill said this spring. "Six months ago, we were not. It's a commodity market."

There's room for growth, he adds: "The mines are big. They consume massive amounts of energy."

When natural gas prices went up last year, US Steel and other large energy users approached AURI for help with alternative fuels, says Jack Johnson, AURI engineer. "Through these end users, we were contacted by suppliers such as Hill Wood Products. They were looking for ag residues."

Demand for Hill Wood's sawdust-based fuel had reached 330 truckloads a month, outpacing supply. Johnson started sourcing other suitable ag materials, including oat hulls and corn. He is currently analyzing ag residues and whole grains to determine Btus (heating ability) and ash content.

Johnson sees an increase coming in alternative energy demand, expanding coproduct use from fertilizers and feeds to fuels. "It's a cost issue. As the price of petroleum-based fuels goes up, it's more attractive to use ag-based renewables."

"Minnesota is pretty energy wise," Hill says. "Not a lot of (ag materials) are being wasted. If the bedding market doesn't get it, the fuel industry gets it."

MOUNTAINS OF BARK

Hill Wood Products, an employer of 60, makes wood moldings, mulch, fiber mats, bedding and wood fiber for composites. Hill says the



Steve Hill (left), owner, and Mike Duame, fuel division manager, at Hill Wood Products in Cook, Minn., run a milling and drying facility that turns wood and ag byproducts into a fine powder that ignites easily and burns as fuel at US Steel's Minntac plant in Mountain Iron, Minn.

company struggled with "mountains of bark and sawdust" — waste that can't be burned because of environmental regulations.

Burning the waste as fuel is a different matter, however. So Hill's company built a dehydration plant to dry bark, sawdust and other materials. A mill turns the dried materials into a fine powder "too volatile for boiler fuel," Hill says. "It's like pouring gas on a fire. It ignites instantly."

Hill's plants in Cook and at Minntac are completely automated. "To do what we did at Minntac is in the millions (of dollars)," Hill says. "They use trailer dumps, mills; they move a truckload every 15 minutes." Hill's company delivers fuel right up to the burner nozzles, and the steel company maintains the burners and piping.

Hill expects that demand for biomass-generated fuel will continue to increase. "More natural gas is being consumed every day so prices will stay high; that will make us viable." ■

QUICK QUOTE: "Since the legislation passed, we've received an influx of calls from groups interested in producing biodiesel." — Rose Patzer

BY DAN LEMKE

Marshall, Minn. — When the state legislature passed a bill this spring requiring that biodiesel be blended with all diesel fuel sold in Minnesota, it was a big victory for the state's farmers. But the mandate was just a first step; now proponents must lay the foundation for a Minnesota biodiesel industry.

"Since the legislation passed, we've received an influx of calls from groups interested in producing biodiesel," says Rose Patzer, an AURI chemist who specializes in biodiesel. AURI, the Minnesota Soybean Research and Promotion Council and the Minnesota Department of Agriculture have formed a task force to address issues facing the fledgling industry.

AURI is also leading a feasibility study on Minnesota's biodiesel potential. "This will be a blanket study for the entire state," Patzer says. "It's a strategic approach to assist groups interested in building manufacturing plants in Minnesota."

The analysis will include a soybean production evaluation, market appraisals, capital requirements and processing costs, and it will identify competitors. The research will review the various feedstocks that biodiesel can be made from and the preferred production methods for each.

Industry analysis should be completed by mid-August; the findings will be released in statewide presentations.

The results will let interested groups perform self-analyses so they can "decide to go further or pull themselves out," Patzer says. Since groups of varying size have expressed interest, large, medium and small opportunities will be addressed.

"We hope to have a very powerful tool for Minnesota," Patzer says. ■



Biodiesel building blocks

AURI undertakes definitive study for an emerging industry