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PHOTO BY ROLF HAGBERG

Golden Camelina

A southern Minnesota farm family is growing and bottling a new heart-healthy oil



PHOTO BY ROLF HAGBERG

Kathleen Batalden Smith (center) offers samples of Omega Maiden camelina oil to St. Peter Food Co-op shoppers Mildred Lindstrand (right) and Gretchen Koehler. The new product venture is a partnership between Kathleen and her father, Phil Batalden, a fourth-generation farmer who raises certified-organic camelina on his farm in southwest Minnesota.

BY LIZ MORRISON

Lamberton, Minn. — After working on agricultural development in West Africa, Kathleen Batalden Smith and her husband Justin Smith came home to rural Minnesota and began some ag development of their own.

Kathleen and her family are growing and bottling organic camelina oil for the health food market. Camelina is a traditional oilseed related to flax. Its golden-colored oil is a good source of heart-healthy, omega-3 fatty acids and Vitamin E.

The new venture, called Omega Maiden, is a partnership between Kathleen and her dad, Phil Batalden. A fourth-generation farmer, Phil raises the camelina on the family's certified organic crop and livestock farm in southwest Minnesota. Kathleen handles oil production and marketing. The company started bottling Omega Maiden camelina oil late last year and is now setting up wholesale and retail distribution.

Returning to rural Minnesota

Omega Maiden grew out of Kathleen's strong ties to the Batalden family farm, where she grew up.

"I've always felt very deeply rooted to the farm. My father, as he transitioned to organic production, developed a passion for sustainable farming and good stewardship, and he passed that on to us. It's something we learned as we grew up."

After college and graduate school, Kathleen and her husband served in the Peace Corps. They spent two years working in a farming village in Niger, an impoverished country in West Africa, where the principal crops are millet and sorghum. The couple taught villagers about natural resources, soil testing, erosion control and crop improvement.

These defining experiences in Africa cemented the couple's desire to live simply in a rural area, Kathleen says. "After living in a small, strongly-knit community in West Africa, we wanted the same for our new home in the U.S."

The Smiths returned to Minnesota in 2010, settling near Kathleen's family in Lamberton. She and Justin share an entrepreneurial outlook, Kathleen says, and wanted to be self-employed. Justin, a professional woodworker, launched a new business, Smiling Tree Toys, a line of fine, hand-crafted wooden toys.

Kathleen wanted to become more involved in her family's farming operation. Buying more land wasn't feasible, she says, so "we've been exploring how to do more with the farm's existing resources. We were also looking for something that had the potential to be a value-added product."

Phil Batalden "has always been very forward thinking," his daughter says, "very progressive." He was interested in new crops to add to his rotation, to aid in weed and pest control. At an organic growers conference, he heard about a hardy, short-season oilseed crop, camelina, which requires few inputs, smothers weeds and can be produced with conventional equipment. He said to his daughter, "If I grow it, can you sell it?" Kathleen was intrigued, so "we dove in head first."

Never heard of camelina?

Camelina, sometimes called false flax or wild flax, is a cool-season oilseed that was widely grown in Eastern Europe until about the 1940s, when it was supplanted by canola. It produces small yellow flowers and tiny seeds that contain 30 to 40 percent vegetable oil, says Russ Gesch, a scientist at the USDA Agricultural Research Service in Morris, Minn., who is working on camelina production improvements.

Today, camelina is being raised commercially in Montana, primarily to make biodiesel. Camelina oil can also be used to make jet aircraft fuel and bio-lubricants.

In addition, camelina oil contains about 35 percent linolenic acid, one of the omega-3 fatty acids, which lower inflammation and contribute to good health. More familiar sources of omega-3 fatty acids are flaxseed oil and fish oil. Camelina supplies almost as much omega-3 as flaxseed, as well as natural antioxidants, including Vitamin E. And camelina oil doesn't deteriorate during storage, like flaxseed oil or fish oil, Kathleen says. Her family likes its mild, nutty taste on salads, roasted vegetables and home-baked bread.

Pressing ahead

The Bataldens planted 3.5 acres of camelina in 2010 and 8 acres in 2011. The crops produced about 1,000 pounds of seed per acre, or 38 gallons per acre of cold-pressed organic oil. The leftover portion of the seed makes a high-protein livestock feed.

The Bataldens contract with a Wisconsin organic producer to extract the oil in a mechanical press, and Kathleen does the bottling by hand. A small grant from the USDA's Sustainable Agriculture Research and Education program paid for start-up costs. AURI food scientist Charan Wadhawan helped analyze nutritional information for the product label. The oil is produced in a state-inspected facility.

Connecting with consumers

Omega Maiden oil is packaged in a high-end glass bottle with a cork stopper and retails as a nutritional supplement at $16 for 8.5 ounces. The upscale look is designed to position Omega Maiden as a premium product, Kathleen says.

The specialty oil is aimed at health-conscious consumers who want local, sustainably-grown farm products, she says. "We're working to revive chemical-free, sustainable agriculture that strengthens rural economies and piques people's interest in traditional foods."

The company's first target market is Minnesota food co-ops. "Consumer awareness is our biggest obstacle," Kathleen says. "Camelina is not well known," and Omega Maiden is one of just a handful of U.S. companies selling it as a retail product.

The Omega Maiden branding effort is designed to highlight the oil's nutritional value, as well as the story of the Batalden family farm, Kathleen says. "We felt that our name should indicate why a consumer would be interested in this product." The label pictures "a strong rural woman," and the company's website, omegamaidenoils.com, gives consumers a way to connect directly with the farm and family.

"We value the quality of life" in farm country, says Kathleen, 31, and "the connections a rural community offers." She and Justin hope other young adults will think about starting businesses and raising families in rural Minnesota, as they are doing. "We hope a rural revival is on its way." ■

About Camelina

The plant: Annual oilseed in the mustard family; grows 25 to 30 inches tall; yellow flowers; pale green leaves and seed pods; very tiny seeds contain 30-40 percent oil, 25 percent protein.

Agronomic traits: Short season crop, 85-100 days; can grow on arid or marginal land; low water and fertilizer needs; cold and drought tolerant; good stands are weed resistant; no major pests; may be susceptible to downy mildew and white mold.

Production: Conventional equipment; can be planted in late fall, winter or early spring, broadcast or drilled; straight combine, or swath and dry in windrows.

Yields: 670 to 2,240 pounds of seed per acre.

Uses: Biodiesel fuel, edible and industrial oil, cosmetics, livestock feed. ■

Source: Russ Gesch, USDA-ARS, and Institute for Agriculture and Trade Policy



PHOTO BY LIZ MORRISON



PHOTO BY ROLF HAGBERG

A guide to omega-3 claims

Omega-3 fatty acids are popular with health-savvy consumers. But for a food processor, it's confusing to know what omega-3 claims can be made on a food label. To help, AURI has developed a claims guide, which provides general information about fatty acids and requirements for health claims. The guide is available on AURI's web site: auri.org.

What's Camelina?

Minnesota organic farmer experiments with new oilseed crop

BY LIZ MORRISON

Camelina is a hardy oilseed that could potentially produce more oil than soybeans or canola with less fertilizer, pesticides or water.

Phil Batalden, a certified organic crop and livestock producer from Lamberton, Minn., has grown camelina on a small scale for two years.

He was looking for additional low-input crops to add to his corn-soybean-small grains rotation when he heard a local extension educator talk about camelina. "He mentioned that the meal makes a high-protein livestock feed, and the oil is quite valuable."

Batalden got some advice about growing camelina from Montana-based Great Northern Growers Cooperative, which produces camelina for oil, feed and fuel. He decided to try the new crop after his daughter agreed to market the oil.

In 2010, a learning year, Batalden planted about 3.5 acres of camelina with a grass seeder pulled by a four-wheeler. "We harvested a crop, but it was seeded too thick," he says.

In 2011, to prepare a better seedbed for the tiny seeds, Batalden made one spring pass with a field cultivator, then packed the ground. He used a grain drill with a grass seed attachment to plant 8 acres of camelina on April 12. Then he packed the field again.

He got a pretty good stand, although some parts of the field were washed out by last spring's heavy rains. Camelina followed soybeans, so nitrogen was adequate, and "we had very good in-season weed suppression."

Camelina seed pods don't all ripen at the same time. On July 18, when about 80 percent of the seed capsules were ripe, he swathed the field, allowed the crop to dry in windrows for several days, then threshed the crop with the combine. Yield was about 1,000 pounds of seed per acre.

Ripe camelina seed pods — round capsules about the size of a marble — tend to break in half during combining, spilling seed, Batalden notes. He was worried about unwanted volunteer plants coming up the following spring, but "we haven't had any problems with volunteers."

The short-season crop leaves enough time after harvest to establish a fall green manure cover crop, such as hairy vetch.

Camelina is quite a bit less expensive to grow than wheat, Batalden says. "I think it has good potential."

He hasn't decided yet how much to plant in 2012. "It depends on how much oil we sell." ■



PHOTO BY ROLF HAGBERG



Soy-straw start-up

A Mankato company is turning soybean straw into particleboard

BY LIZ MORRISON

Mankato, Minn. — Green doors are opening in southern Minnesota.

Agristrand Mankato, LLC plans to manufacture soybean-straw door cores and furniture panels — a renewable alternative to wood particleboard. The $10.25 million start-up has purchased the former Environ Biocomposites factory in Mankato and is set to begin production this spring.

Agristrand Soy Board is a rare value-added use for soybean straw, says Agristrand board member Dan Beenken, a farmer from Buffalo Center, Iowa. "Most new uses for soybeans have been for meal and oil. There's been very little done with soybean fiber."

The idea for soybean particleboard was born over a cup of coffee.

Tom Neel, president of Neel Lumber Company, Panora, Iowa, was talking with three friends over coffee about the high price of particleboard, which is widely used in doors, furniture, cabinets and counters. Particleboard is a composite of wood fragments and resin, bonded together under heat and pressure. Prices for the material fluctuate sharply, depending on wood supplies and value.

Neel wondered if there wasn't a more price-stable source of cellulosic fiber that would work as well as wood. That question led the four Iowa businessmen — Neel and Agristrand co-founders Tim McDermott, Barry Monaghan and William Priestley — to the woody stems of soybean plants.

Twiggy stems

Soybean stems, which look like dried twigs, have several advantages for particleboard, says Dan Biller, Agristrand vice president of sales and marketing. "They have characteristics similar to wood," and the soy-straw board is comparable to wood-based products in look, feel and uses, Biller says. The stems are also abundant and easy to collect.

The Agristrand founders worked with the USDA Forest Products Laboratory in Madison, Wisc., to formulate a soy-straw particleboard that meets industry requirements for composite building material. "We achieved those standards in 2010," Biller says.

AURI helped the company test ways to chop and clean the straw before it's pressed into boards. Work at AURI's coproducts pilot lab in Waseca led to a proprietary method for preparing the raw material.

"AURI has been very helpful with the up-front processing," Biller says. "Our conditioning equipment is portable, so it can be taken out to the straw storage sites." That cuts the cost of trucking bulky round bales to the factory. The conditioned soybean straw looks and handles like wood chips.

At the factory, soy straw is combined with "eco-friendly" resins that don't add formaldehyde — a strong selling point for the green building materials market, Biller says.



PHOTO BY ROLF HAGBERG

Tom Neel, Agristrand CEO (right) and Dan Biller, sales and marketing vice president, are commercializing a particleboard made from soybean stems, to be used in door cores and furniture panels as a renewable alternative to wood particleboard.

Another advantage: "Our process captures all the dust and uses no water." Those are two common environmental issues with ag fiber processing, he says. AURI is helping the company pelletize the captured dust and fines generated during manufacturing. Potential uses for these byproducts include biomass fuel pellets and animal bedding, says Al Doering, director of AURI's coproducts lab in Waseca.

Late last fall, Agristrand completed a $10.25 million capital drive and purchased a 160,000-square-foot factory in Mankato. The facility, constructed in 1998 for about $50 million, has an annual processing capacity of 40 million square feet of board. It had been idle for 15 months.

Agristrand will finish upgrades to the plant this spring. At full production, the factory will employ about 50 workers and process soybean straw from 45,000 acres in southern Minnesota and northern Iowa.

Making buildings greener

The U.S. furniture and building trades used more than 2 billion square feet of particleboard in 2011. In such a huge market, "we don't need to be a big player to do well," says Biller, who has spent his entire career selling building materials.

He's positioning Agristrand soy board as a niche product that offers a "unique green value." Soy-fiber door cores and panels should qualify for USDA's BioPreferred Program, which promotes renewable products. The soy-straw panels also contribute points towards the U.S. Green Building Council's LEED certification. A growing number of builders and institutions are pursuing this badge of environmental sustainability, Biller says, "and more consumers are asking for it, too."

Agristrand's Minnesota location is also a marketing plus, Biller says. Most particleboard manufacturers are located on the Coasts. But "there are a lot of door manufacturers here in the Upper Midwest." For those markets, Agristrand has a significant shipping advantage over more distant suppliers, he says.

Agristrand's strong management team is another advantage, Doering says. The company's executives "have a minimum of 25 years of experience each in the wood products industry or the financial industry."

That struck investor Dan Beenken. "I'm very impressed with their passion for what they're doing, their management capabilities. Their skills complement each other very well, and the same is true of the board members."

Launching this new business has been a tough yet rewarding challenge, Biller says. "Building a company, putting people back to work, making a useful product. We're very proud of that." ■



PHOTO BY ROLF HAGBERG

AURI and Agristrand

Idea to opportunity: Agristrand wanted to make particleboard out of soybean fiber.

Outcomes: AURI helped the company develop a proprietary process to chop and clean the raw material before it's made into panels. The company will begin manufacturing operations in Mankato this spring.

Agristrand purchased an idled 160,000-square-foot wood board manufacturing facility in Mankato and is converting it to make soy-straw particleboard. The plant is expected to employ 50 workers and process stems from 45,000 acres of soybeans.

Area farmers supplying soy board raw material

BY LIZ MORRISON

Many of Agristrand's 45 shareholders are farmers from Minnesota and Iowa, who will also supply the raw material to make soy-straw particleboard.

"We are excited about our partnership with local farmers," says Tom Neel, Agristrand president and CEO.

Tom Strueker, who farms in Emmet County, Iowa, invested in the start-up and serves on the board. He was attracted by Agristrand's "good product and good management team."

Last fall, Strueker supplied 700 acres of soybean straw. He disconnected the chopper on his combine, saving about 10 percent on fuel consumption, and deposited the residue in windrows. A contractor baled the straw and transported it to a northern Iowa storage site. "All we take is the stem," Strueker says. "We pick it up loosely so the leaves and pods stay on the field."

Straw yield in 2011 averaged about one ton per acre, he says. Soybean stems supply very little organic matter or nutrients to the soil, he says, so removing them isn't a concern.



"We're actually fighting too much residue at times," says Dan Beenken, a farmer from Buffalo Center, Iowa. Like many Iowa and Minnesota growers, he has added more years of corn to his crop rotation. "So soybean residue removal isn't really an issue. And we're only taking about a ton per acre once every three years or so." He harvested 210 round bales of soy straw from a 130-acre field last fall. Afterwards, "the field didn't look much different than normal."

Agristrand pays $45 per ton for soy straw, baled and delivered, for a net farm return of about $15 per acre, Beenken and Streuker estimate. ■

Heating the Midwest

AURI inventories biomass for a six-state initiative

BY ASHLEY HARGUTH

AURI is joining forces with a six-state consortium that wants biomass to heat up the nation's heartland.

Heating the Midwest is a newly-formed biomass group with industry, government, nonprofit, university and tribal representatives from North Dakota, South Dakota, Wisconsin, Illinois, Minnesota and Michigan. All have an interest in promoting the use of agricultural or woody biomass for heating.

The biomass group has five action teams. AURI's Becky Phillip, project director, and Al Doering, coproducts scientist, are leading the biomass resources team. Other action teams will focus on demographics, benefits and consequences, biomass combustion technology and policy.

As a result of their team involvement, Doering and Philipp developed an AURI initiative called Midwest Biomass Resource Inventory Assessment. "The goal is to provide a real snapshot of what is currently available for heating," Doering says.

The study is intended for businesses interested in using biomass energy and Heating the Midwest participants. "This report should support many biomass projects in the state," Doering says.

AURI is collaborating with David Ripplinger from North Dakota State University's department of agribusiness and applied economics. Organizations from the six states involved with Heating the Midwest will submit biomass inventories that are already compiled. For example, the Minnesota Department of Natural Resources provided wood data.

Ripplinger will compare the submitted numbers with the U.S. Department of Energy's "Billion Ton Study," which estimates biomass availability.

The Midwest Biomass Resource Inventory Assessment will detail woody and agricultural biomass available in each state, along with biomass that could be considered, such as CRP land, Doering says. The report will be released at the April 2012 Heating the Midwest conference in Eau Claire, Wis., and online at auri.org.

The biomass assessment is funded by AURI, Bemidji Joint Economic Development Commission and Minnesota Power. ■


PHOTO BY ROLF HAGBERG

AURI is participating in a Midwest initiative to promote biomass heat and is completing an inventory of all woody and agricultural biomass available in a six-state area that could be converted to heating fuel.

Four generations of Cedar Summit farmers

Cedar Summit Farm's drinkable yogurt joins a line of milk and cream products processed at a family-owned, on-farm creamery. Beside food co-ops and natural food stores, Cedar Summit markets its products in a retail store built on a farm that has been in the family for four generations.

The farm's original 120 acres was purchased in 1926 by the grandparents of Dave Minar who, after graduating with a bachelor's degree in ag economics and dairy science, started farming with his father in 1963. He then worked as a livestock breeder technician before returning to the farm in 1969 with his wife Florence and the first three of their five children.

In 1971, the Minar family built a 60-stall cattle barn and started developing a registered Holstein herd that received state and national awards. In 1974, the Minars stopped using pesticides and, in the late 1980s, became interested in allowing animals to harvest their own feed for most of the year.

"The idea, which we found exciting, was that all of our land, some of which adjoins Sand Creek, would be in permanent pasture grasses and thus would stop erosion," Dave Minar writes on the Cedar Summit website. "We could see how it would improve our quality of life with less feed to harvest."

In 1994, the Minars built a milking parlor and decided to start a direct marketing business with 900 pasture-raised chickens. "Our chickens sold out and we were on our way," Minar says. They decided to expand and first considered grass-fed beef. "After many family meetings the decision was made to process our own milk."

In 2002, the Minars opened an on-farm creamery, which produces 300 to 400 gallons of milk daily from Cedar Summit Farm cows and a small neighboring dairy. The family also built a retail store that carries local eggs, honey, maple syrup, meat, cheese and butter, as well as Cedar Summit products.

Today the Cedar Summit Farm business includes two farms — 200 acres in New Prague and 160 acres in McGrath, Minn. — and an additional 240 acres leased in southeast Minnesota. Most is pastureland for livestock grazing and the rest is seeded in grasses that can be harvested and stored for winter forage.

Today the farm no longer raises chickens but does raise steers and hogs, which "love the waste milk from the creamery," Minar says. "It is a good feeling to be able to supply our community with high quality, fresh food." ■



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Family creamery offers org

BY CINDY GREEN

New Prague, Minn. — Consumers who love their probiotics may be smiling with thick, white mustaches.

A new drinkable yogurt has been released by Cedar Summit Farm, a fourth-generation family business in southeast Minnesota. The creamy beverage is available in tangy-plain and lightly-sweetened vanilla flavors in quart-size glass returnable bottles.

"It's just delicious," says AURI food scientist Charan Wadhawan, who recently completed a nutritional analysis of the new product. "And it's good for you … It's easier to digest than milk because it's fermented."

The yogurt drink is produced from grass-fed, organic, non-homogenized whole milk, with added live and active cultures. Cedar Summit Farm makes it at one of the few remaining on-farm creameries in the Midwest. The family business, managed by Dave and Florence Minar and their son Mike, includes an on-farm store that markets a variety of local products, along with Cedar Summit Farm milk, cream and yogurt.

The creamery processes 300 to 400 gallons of milk per day from dairy cows grazed outdoors for seven months. After plants go dormant in the fall, cows are fed stored grass for five months.

Beverage of choice

Before developing the drinkable yogurt, Cedar Summit tried other value-added products, such as ice cream and dips. But, with market research and business plan assistance from USDA-funded Cooperative Development Services in Saint Paul, the family chose drinkable yogurt because of its "health benefits and the fact that there aren't many organic drinkable yogurts in the market," says Mike Minar, Cedar Summit's business manager.

AURI helped fund product development and Dennis Timmerman, AUR project director, linked Minar to a University of Wisconsin dairy-food development service in River Falls.

After the yogurt recipe was perfected, Minar sent samples to AURI laboratories in Marshall where analytical chemist Ranae Jorgenson did a complete analysis. Wadhawan entered results into a database at AURI laboratories in Crookston and produced a nutritional label.

Cedar Summit Farm drinkable yogurt is a rich source of probiotics, Wadhawan says. The good bacteria in live cultures will digest milk proteins and produce lactase enzymes that break down some of the sugars, making milk easier to digest, she says.

"So people who are lactose intolerant — depending how intolerant they are — may be able to drink yogurt and not milk."

Probiotics are especially important when taking antibiotics that kill good as well as bad bacteria, Wadhawan says, and they improve the digestive system's ability to absorb calcium and B vitamins.

Starting slow

Cedar Summit Farm started marketing its drinkable yogurt in October. While the business sells its milk and cream products in about 50 food cooperatives



probiotics

ganic, drinkable yogurt

and natural food stores, fewer than a dozen have added the drinkable yogurt so far. But "sales are slowly growing, and we're working on a marketing campaign," Minar says. Cedar Summit has hired a retired chef to give out in-store samples and promote the product's merits "to get more people to try it," Minar says.

In addition to vanilla and unsweetened plain flavors, Minar says he is working on a raspberry flavor that should be ready to market this summer. "It's been difficult to locate an organic fruit source," Minar says. "I thought we had found one and then it turned out their entire berry crop was under contract with another company."

Minar says he doesn't want to expand the product line too fast. "We're just watching costs and trying to keep sales up." ■







Top photo: On right, Mike Minar, Cedar Summit Farm business manager, shows freshly-bottled drinkable yogurt to Dennis Timmerman, AURI project director, at the Minar family's on-farm creamery. Mike operates the dairy with his parents Florence and Dave Minar (pictured on cover) who started farming in 1963 on 120 acres purchased by Dave's grandparents in 1926. Cedar Summit Farm cows (above) are grass fed outdoors in the spring through fall, then fed stored grasses in the winter.



AURI and Cedar Summit Farm

Idea to opportunity: Add a new product to Cedar Summit Farm's organic, grass-fed milk and cream line produced at its on-farm creamery.

Outcomes: Drinkable yogurt was introduced to the marketplace in October. AURI assisted with product development, nutritional analysis and labeling

PHOTOS BY ROLF HAGBERG

Right on the facts

Behind every food label is a good scientist

BY CINDY GREEN

The food marketplace may be hungry for new and different products. But it spits out more than it chews. When entering the market, food products have to be at their competitive best and meet all regulations, including labeling.

AURI food scientist Charan Wadhawan has been helping entrepreneurs develop, improve and commercialize new food products for three decades. The biggest demand for her service is nutritional analysis and labeling. Hundreds of aspiring entrepreneurs have requested this assistance so they can compete with giants on the food shelf.

What goes into developing a nutritional label? At a minimum, Wadhawan enters each of a food formula's ingredients into an extensive database. But it's not as simple as entering "flour."

"If you say 'all-purpose flour,' there are so many and they can vary in protein content," Wadhawan says. "If you are making bread, there is bread flour and, if cake, cake flour. There is a lot of protein difference between the flours."

"When I input any ingredient, I pick out the right one from my database," which includes all of the USDA's data on products tested plus thousands more. Wadhawan's database includes more than 30,000 ingredients — from a wide range of manufacturers and locations.

"USDA data is based on products from different regions of the country and averaged out," Wadhawan says. "But product purchased in Texas and Minnesota could be slightly different."

Exact details

The more specific the information that goes in, the more accurate the nutritional report will be. "If (a food business) says 'ketchup,' I don't know if they will be sticking with one brand, so I will use the standard values for ketchup. Otherwise I use the specific brand and tell them that if they change, it is their responsibility to change the nutritional facts."

Typically, Wadhawan also analyzes moisture content because ingredients can lose moisture when processed, along with nutrients. "If a product contains vitamin C and it's cooked, most of it is destroyed by heat."

Some products do not have to be analyzed on every count. For example, Wadhawan knows that some ingredients do not contain fiber. And if it's a vegetable product, "we know that cholesterol only comes from animal sources," she says.

After all ingredient information is entered, a serving size is determined and the software system will compile a nutritional report. Wadhawan then prints a nutritional label that can be reproduced on product packaging.

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New AURI chair passionate about agriculture's future

BY AMANDA WANKE

The role of AURI board chair is a natural fit for Ron Obermoller, who was elected to the position on January 19. A lifelong farmer, with a background in animal science and agronomy, he has been passionate about ag research since a young age. "You're creating the future," says Obermoller, whose 800-acre farm has been in his family for 100 years.

Obermoller has served in leadership positions with Minnesota Corn Growers and Minnesota Soybean Growers over the past 20 years. He has worked closely with the National Corn Growers and was a founding board member of Minnesota Soybean Processors.

"I've always been on the research committees. That's my niche," says Obermoller, who says he is proud of AURI's agricultural research and innovation work and its growing role in Minnesota.

"We need to further develop the technologies, get it into the farmers' hands and make it usable," he says. "I look at AURI with the years of experience and the contacts we have, and we're a fantastic resource."

Obermoller says he is excited about continuing to expand AURI scientists' innovative work. "There are a lot of ideas out there … some really wild ideas pan out and sometimes they don't. But we need those original thinkers, and we need people like the staff at AURI who explore these ideas and tell us what's economical and what's feasible."

Collaboration between commodity groups and AURI is critical to agriculture's future, Obermoller says. "The checkoff and growers groups have the contacts with the farmers, and AURI scientists have contacts with industry and science-based experts. We want to draw on everyone's expertise, and I'm hoping everyone can benefit from the collaboration."

Obermoller says he wants to help spread the word about AURI's value to Minnesota. For example, he says in the past two years AURI has:

- helped bring more than $123 million in capital investment to Minnesota
- leveraged nearly $2.5 million in outside funds for projects
- brought 143 new or improved ag-based products to market
- assisted in developing more than 325 unique projects and initiatives

Obermoller concludes: "It all comes back to helping the rural economy."

Wanke named AURI communications director

Amanda Wanke joined AURI in January as director of communications. She oversees AURI's communications efforts including the organization's website, print materials, electronic newsletter, tradeshow displays and media outreach.

Prior to AURI, Wanke was director of communications for Bethel University, which is located in St. Paul, Minn., and serves more than 6,000 undergraduate, graduate and seminary students. She also served as press secretary for former U.S. Congressman Gil Gutknecht and held several internships in communications and public policy.

Wanke holds two degrees from Bethel University: a master's degree in organizational leadership and a bachelor's in political science with a minor in communication studies.





Longtime Ag Innovation News editor steps down

BY LIZ MORRISON

With this issue of Ag Innovation News, managing editor Cindy Green steps down as the leader of a publication she helped launch in 1992.

For two decades — first as AURI's communications director, and later as a freelance editor — Green set the standard for Ag Innovation's lively stories and engaging photos and graphics. "So much technical information and research comes with its own lingo," she says. "We wanted to put out a publication that is easy to read — and fun to read."

The colorful quarterly publication has always been intended for a broad audience. That's important at a time when most people no longer have a direct connection to agriculture, Green says. "The newspaper gives them a window into what's going on in Minnesota agriculture. It's not just farming."

Along with stories about AURI projects and research, Ag Innovation News features profiles of Minnesota entrepreneurs and innovators. "It's inspiring when you see the innovative work people are doing, whether in the research lab or a small business," Green says. Some of her favorite stories over the years have been about creative — and sometimes offbeat — entrepreneurs.

Take Canton, Minn., hazelnut breeder Phil Rutter, whose orchard included a three-stall outhouse with large window views of the woods, worthy of House Beautiful.

Or the VanDerPol Family of Kerkhoven, Minn., makers of Pastures A Plenty free-range pork products. The VanDerPols are state leaders in raising hogs in pastures and open, straw-filled barns. "I went out there and the little pigs were playing and digging in the straw. I called it the 'happy pigs' story."

Or Lucy Steinkamp, of Hinckley, Minn., a French transplant who so missed the rich sheep milk products of her homeland that she founded La Paysanne, which produced sheep milk cheese and ice cream.

Green oversaw many special focus editions of Ag Innovation News, which gave readers an in-depth look at subjects ranging from alternative energy, to food marketing, to novel uses for crop residues. "My favorite was an issue on what it takes to be an entrepreneur," she says. The 1994 special edition included tell-it-like-it-is advice from innovators who came to AURI for help turning ideas into successful enterprises.

Green, of Stillwater, is herself an entrepreneur. She grew up on a farm in Big Stone County and earned degrees in journalism and American studies from Minnesota State University Moorhead. After college, she bought a small Minnesota weekly newspaper, the Milan Standard-Watson Journal, which she published for three years. Reflecting Green's wit and sense of fun, her newspaper's banner featured a Viking riding a goose. (Milan has a proud Norwegian heritage, and Watson bills itself as the goose capital of the world.) Later, Green worked as development director for Pioneer Public Television in Appleton, Minn.

Green joined AURI in 1988, when it was part of what is now Minnesota Technology. She served as AURI's communications director until 1996, when she left to start a communications consulting business. She wrote and produced a public television documentary, "Country Spires," which was nominated for two regional Emmy awards in 2000. The three-part series explored the history and architecture of rural churches in the Upper Midwest.

In 2007, Green became development director for Conservation Corps Minnesota & Iowa. The nonprofit offers young people service-learning opportunities in natural resource management, energy conservation and emergency response. In addition to her work in conservation, she is partnering on another new venture, a vacation rental business.

Reflecting on her long tenure at Ag Innovation News, Green says "it feels like AURI is part of my DNA. It has been an incredible experience being part of the organization's growth, challenges and transitions. I grew up on a farm, owned a rural business, and will always be strongly committed and connected to agriculture and rural Minnesota."

"We have so appreciated Cindy's long-term great work and insights," says Teresa Spaeth, AURI executive director. "It will be very hard to fill her shoes, and she'll be sorely missed." ■



Where's the cellulosic ethanol?

BY RANAE JORGENSON
AURI ANALYTICAL CHEMIST

Renewable fuel advocates have high hopes for cellulosic ethanol — made from plant waste rather than corn. Reality may take a little longer.

A federal mandate passed a few years ago required that 250 million gallons of cellulosic ethanol be included in U.S. fuel consumption by 2011 and 500 million gallons by 2012. The provision was part of the Energy Independence and Security Act of 2007, which mandated that renewable fuel use in our country increase from 9 billion gallons in 2008 to 36 billion gallons by 2022.

Starting in 2016, the entire increase in the renewable fuels target was to be met with advanced biofuels such as cellulosic ethanol and other non-cornstarch-derived fuels.

But there is a problem: cellulosic ethanol is not yet commercially available. So the U.S. Environmental Protection Agency had to lower the target volumes to 6.6 million gallons of cellulosic ethanol in 2011 and 8.65 million gallons in 2012.

So when will the cellulosic ethanol industry start producing the needed quantities? The fuel's technology has not advanced as rapidly as predicted. Research, development and investment are ongoing, but it will be several years before cellulosic ethanol production is at federal targets. POET, the world's largest ethanol producer, announced it is constructing a cellulosic ethanol plant in Emmetsburg, Iowa that will produce about 25 million gallons a year starting in 2012.

How does this impact Minnesota agriculture? The market for corn-based ethanol is not likely to be undercut by cellulosic ethanol any time soon. Corn ethanol production is increasingly more efficient. AURI is supporting innovations such as using fungus to treat thin stillage, which allows clean water to be recycled back into ethanol production to increase efficiencies, and using alternative ag feedstocks for fermentation such as beet pulp.

AURI is focused on developing alternative biomass uses. But not all of the available biomass will be converted into cellulosic ethanol. We are looking at opportunities such as converting biomass to solid fuels, advancing torrefaction and pyrolysis technologies to produce biochar or bio-oil, and developing high-value specialty chemicals from ag coproducts. AURI continues to identify and support these applied research activities that advance Minnesota agriculture. ■

Facts continued from page 7

A closer look

Some products' nutritional analysis takes a little more digging. "If we're not sure of their process, or loss of fat or moisture, then I need to get the actual analysis done on a product sample," Wadhawan says.

If it's a new product, Wadhawan has AURI analytical chemist Ranae Jorgenson do laboratory tests. In the case of Cedar Summit Farm's drinkable yogurt, "we wanted to see if there was any difference between grass-fed milk and the data provided by the USDA on regular milk." Results showed it was close to the same.

"Some prepared products — Mexican tamales, for example, go through a process of cooking corn certain ways. There are so many processing steps, and it's hard for me to know completely how each was done. So I will get a complete analysis of the tamale," Wadhawan says. "I also use the recipe and do the database analysis to make sure the data matches."

Products such as smoked meat may lose fat while being processed. "We can't guess how much, so I will have Ranae run the fat and cholesterol analysis" on the final product, Wadhawan says. After using a solvent extraction, Jorgenson measures the fat content.

Most analysis, including moisture, protein, fat and carbohydrates, can be done in AURI laboratories. Fiber content has to be measured by outside labs. "We use various standardized methods for each analysis," Wadhawan says. "They are approved by the Association of Official Analytical Chemists." ■

Editor's Note: This ongoing feature updates readers on activities, projects and events in AURI's four primary focus areas. For more information, visit auri.org.

BY ASHLEY HARGUTH

Food Products

Meaty presentations

AURI has been busy this winter connecting with meat processors across Minnesota. In March, AURI meat scientist Carissa Nath gave a presentation on antimicrobial interventions, and their usefulness in small meat facilities, at the Minnesota Association of Meat Processors.

In January, Nath presented on natural and organic meat-processing techniques at the Minnesota Organics Conference. She focused on labeling, processing and handling issues related to natural and organic meat products. Both presentations included results of AURI research initiatives.

Biobased Products

Profiling biomaterials

Looking at conventional plastic characteristics and the potential to integrate biobased materials into plastic manufacturing is the focus of an AURI initiative, coming out of a biobased event in Mankato, Minn.

The plastics industry has developed various products that incorporate biobased materials with desired characteristics, but not all biomaterials have qualities that meet specific needs of the industry. Through this initiative, scientists will profile and catalog conventional material qualities preferred by the plastics industry. The profile will be cross-referenced with biomaterials to provide a roadmap of material qualities needed to advance bioproducts that can compete with conventional plastics.

Renewable Energy

Minnesota Renewable Energy Roundtable

In March, the Minnesota Renewable Energy Roundtable convened at the Earle Brown Heritage Center in Brooklyn Center to explore new developments in renewable energy.

The morning plenary session featured Todd Taylor of the Fredrickson & Byron law firm in Minneapolis, who discussed the state of renewable energy in Minnesota. Other presenters spoke on University of Minnesota intellectual property guidelines, NexGen Energy grant awards, and the governor's new initiative: Minnesota Business First Stop.

In the afternoon, attendees participated in three panel discussions: alternative feed ingredients from renewable energy coproducts, advancements in biomass and new opportunities for Minnesota biofuels facilities.

Coproducts

Biomass feasibility study

An AURI initiative is looking at biomass heating feasibility. The study will evaluate various heating elements, fuels, technologies and the costs of half million, 3 million and 5 million Btu biomass systems. A guide will be developed for key industries, such as poultry and greenhouse operations that need to stay competitive as fuel costs rise.

The project's intent is to build awareness of competitive fossil fuel alternatives, address rising propane costs and demonstrate alternative uses of agriculture and forestry residues. Ultimately, the project could generate enough interest to develop one or two commercial-scale pilot projects, says Randy Hilliard, AURI project director. The pilot plants would demonstrate renewable energy heating systems that use biomass to replace high-cost fuels such as propane.

Goat Study Correction

The goat meat feasibility study referenced in the "AURI and checkoff dollars at work" article in the last issue of Ag Innovation News was funded by AURI, and not with Midwest Dairy Association checkoff dollars.



New look, same great results

BY TERESA SPAETH
AURI EXECUTIVE DIRECTOR

Imagining. Changing. Testing the limits to see what's possible. Innovation always looks forward.

AURI is leading the way in Minnesota agricultural innovation. To better articulate that vision to a growing audience, we've made some changes to our logo and visual identity that you will notice in this issue of Ag Innovation News as well as our redesigned website: auri.org.

We want you, our readers, to know that we are committed to constantly finding new and better ways to use our agricultural commodities. While we're always looking forward, one thing will never change: our commitment to excellence in our three core service areas:

Idea-generating research:
We research ideas, opportunities and new technologies that can benefit our clients and industry as a whole.

Resource networks:
We bring together networks of professionals who can assist each other in the creation or improvement of new products and processes.

Hands-on scientific technical assistance:
We provide direct product and process development support in our labs and via our scientific staff and leverage this capacity to access external R&D resources that we do not possess in-house.

Thank you for the ways you partner with AURI to help redefine agriculture's future. I'm excited to see what's ahead. ■

ELSEWHERE IN AG INNOVATIONS

BY ASHLEY HARGUTH
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.



Driving with sweet tires

Drivers could soon be traveling on more sustainable tires. A technology is being tested to replace some of the petroleum ingredients in tires with renewable feedstocks. Annually, seven billion gallons of crude oil go into producing one billion tires worldwide.

The new tire material will use sugars derived from switchgrass, corn, corn cobs or sugar cane to produce bioisoprene. The sugar-based isoprene may be used in other rubber products, such as diapers and surgical gloves, to replace petroleum-based isoprene.

From: Biobasednews.com
March 26, 2010

Waste fuels the skies

Plants and fat are helping fuel our aircraft. Alaska Airlines recently announced that it is using 15,000 gallons of biofuel in an 80/20 blend with ordinary jet fuel for some of its flights. The biofuel is derived from chicken fat, algae oil, used fryer grease and plants.

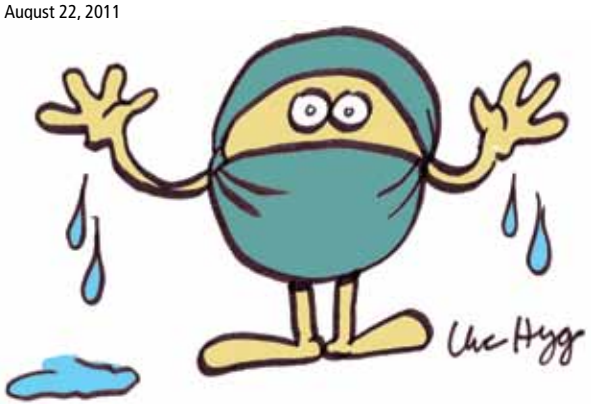
Biofuel can be used in planes with no modifications. Researchers say that if just three dozen U.S. commercial airports use the biofuel blend, more than half the U.S. passenger jet traffic would fly with renewable fuels.

From: Soyatech.com
November 16, 2011

Plants surviving the ozone

USDA scientists are breeding more ozone-tolerant crops after finding that future ground-level ozone could reduce soybean yields by 23 percent. Researchers are testing plants under conditions predicted for 2050, when ozone levels could be 50 percent higher than today's concentrations. Researchers are finding different ozone tolerances in plants, which could help determine breeding for more ozone-tolerant varieties.

From: USDA-ARS
August 22, 2011



Soy scrubbing in for surgery

A soy-protein isolate could potentially be used in surgical dressings for burns, in facial masks and for reducing wound inflammations, a China study shows. Researchers studied color, transparency and heat-sealing ability of the soy-protein films.

From: Soyatech.com
January 26, 2012

Omega-3 to fight nerve damage

Omega-3 may help protect and regenerate nerves, according to University of London research. Studies on damaged mouse nerve cells found that omega-3 fatty acids gave cells protection and decreased cell death. Another study found that the sciatic nerves of mice recover more quickly and fully with omega-3. Studies suggest the fatty acid could have a role in treating peripheral nerve injuries.

From: MedicalNewsToday.com
January 12, 2012

Malaysian plant could lower blood sugar

Extracts from a Malaysian plant, the Water Apple, may help diabetics. A research team from Monash University in Malaysia found that the plant's leaf extracts contain flavanoids that can lower or stabilize blood sugar levels. Certain flavanoids were found to be more effective than some diabetes medications.

Along with being an anti-hyperglycemic agent, these extracts could potentially help control diabetes complications and are currently under further laboratory study.

From: Food Chemistry
January 2012



Soda bottles made from plants

Coca-Cola recently announced it will have 100 percent plant-based bottles on the market within five years. Currently, the company's recyclable PlantBottle is made from 30 percent plant materials. The company is evaluating molasses, sugarcane and plant-residual materials for its new bottles.

From: Foodproductiondaily.com
December 16, 2011

AURI provides assistance to Minnesota businesses, entrepreneurs, cooperatives and emerging companies to develop new uses for agricultural products, generate economic activity and stimulate job growth.

AURI is a dynamic research institute that provides scientific technical assistance, access to laboratories and pilot plants, technical and market feasibility reviews and a network of resources to help ideas become reality.

Project focus areas:

- Food Processing
- Ag-based Renewable Energy
- Biobased Products
- Coproduct Utilization

AURI helps clients:

- Develop a product or process
- Find process efficiencies
- Identify potential revenue streams
- Determine feasibility
- Prove a concept
- Advance to commercialization
- Find information on value-added agricultural industries

AURI technical staff have expertise in:

- Food product development (including meat and grain product specialists)
- Recipe scale-up and formulation
- Nutritional analysis
- Pellet fuel development and feedstock densification
- Anaerobic digestion
- Project management
- Network development
- Many other areas

What to expect when working with AURI

- Seamless service from idea to implementation.
- Unbiased information grounded in science, technical knowledge and experience.
- Assistance from scientists and technicians in unique laboratory facilities.
- Dedicated project staff who help assess market opportunity, develop an implementation plan, explore available resources, and facilitate coordinated services from AURI.
- Access to leading research in agricultural processing in the areas of food, renewable energy, biobased products and coproduct or waste product utilization.
- Connections to a variety of resources that help businesses achieve goals.

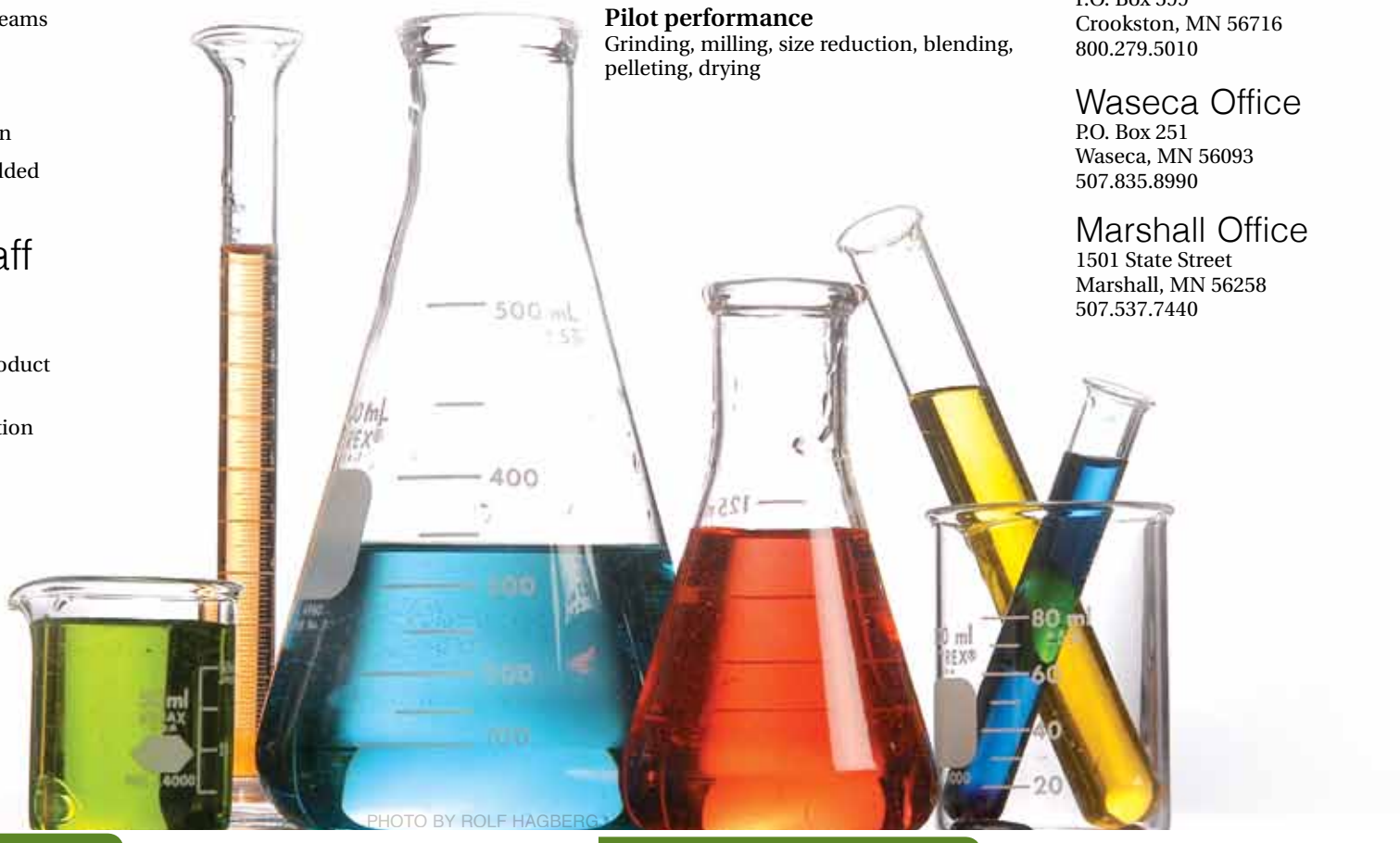


PHOTO BY ROLF HAGBERG

AURI's specialized laboratories

AURI laboratories in Crookston, Marshall and Waseca provide specialized testing, analysis and product development assistance including:

Food product development
Sensory evaluation, nutritional assessment, regulatory assistance, packaging assistance, recipe formulation

Analytics
Microbial, gas analysis and chemical analyses

Fats and oils testing
Analysis in fats/oils, biomass, food, feed and meat

Meat products
Smoking, packing, processing and other meat product development

Coproduct utilization
Fertilizers, sorbents, renewable fuels, energy, animal feeds, soil amendments, biodegradables

Pilot performance
Grinding, milling, size reduction, blending, pelleting, drying

How to get involved with AURI

- Contact one of the AURI offices to speak with a project development director about your business.
- Visit www.auri.org to see the latest research and learn about upcoming events.
- Sign up to receive Ag Innovations News or the AURI e-newsletter to stay informed about AURI projects and clients.
- Follow AURI on Facebook and Twitter to get notices about new research, upcoming events and where to find AURI at tradeshows.

Visit www.auri.org or contact one of our regional offices:

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Blooming macaroons

Entrepreneur is aspiring to take mom's recipe to a national level

BY ASHLEY HARGUTH

Minneapolis, Minn. — Larry Shiller's mom died three years ago at age 98. Her chocolate macaroons live on.

In 2009, when Shiller decided to produce gluten-free macaroons for the commercial market, he couldn't think of a better way to honor his mom than give his business her maiden name: Lily Bloom.

Minnesota-made Lily Bloom's Kitchen macaroons are all-natural, coconut treats, covered with dark or white chocolate. They have been featured on the Rachael Ray show and foody websites such as dessertbuzz.com and chocolateatlas.com.

Gluten-free is the fastest growing food sector, as more people are diagnosed with Celiac disease, Shiller says. "Gluten-free products aren't always known for being tasty, but our macaroons are."

Lily Bloom's Kitchens offers a variety of macaroon flavors and chocolate bark. Coconut and dark chocolate are blended with cherry, orange, cinnamon, almond, walnut and peanut butter, and white chocolate with raspberry, lemon and key lime.

Last fall, Lily Bloom's offered a harvest blend with pumpkin pie and caramel apple flavors and, in the spring, a fruit medley of strawberry, blueberry and pineapple. Shiller also created a 'poparoon,' basically a macaroon on a stick, for gift baskets.

At his friends urging, Shiller contemplated making his mom's macaroons for the retail market years ago. He met with business consultants and, although they said the macaroons would be a viable product, he was discouraged by business start-up costs.

After his mother died, Shiller, who lives in Shoreview, Minn., decided to follow the macaroon path. He found industrial kitchen space and began selling macaroons at farmers markets. He contacted AURI food scientist Charan Wadhawan to help with nutritional analysis and labeling. Wadhawan says she created more than 26 labels for Shiller, including various packaging and serving sizes.

Lily Bloom's Kitchen now has two full-time and several part-time staff, a website and is marketing to grocery store and gift shop markets in the Midwest and East Coast. National exposure from the Rachael Ray show "was a great way to add credibility to our product," Shiller says.

Next steps? Serve caterers and wedding planners, sell in bulk, distribute to more specialty and high-end stores and broaden national markets. ■

For more information on Lily Bloom's Kitchen or to order macaroons and chocolate bark, visit lilybloomskitchen.com.