



Ag Innovation News

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PHOTOS BY ROLF HAGBERG



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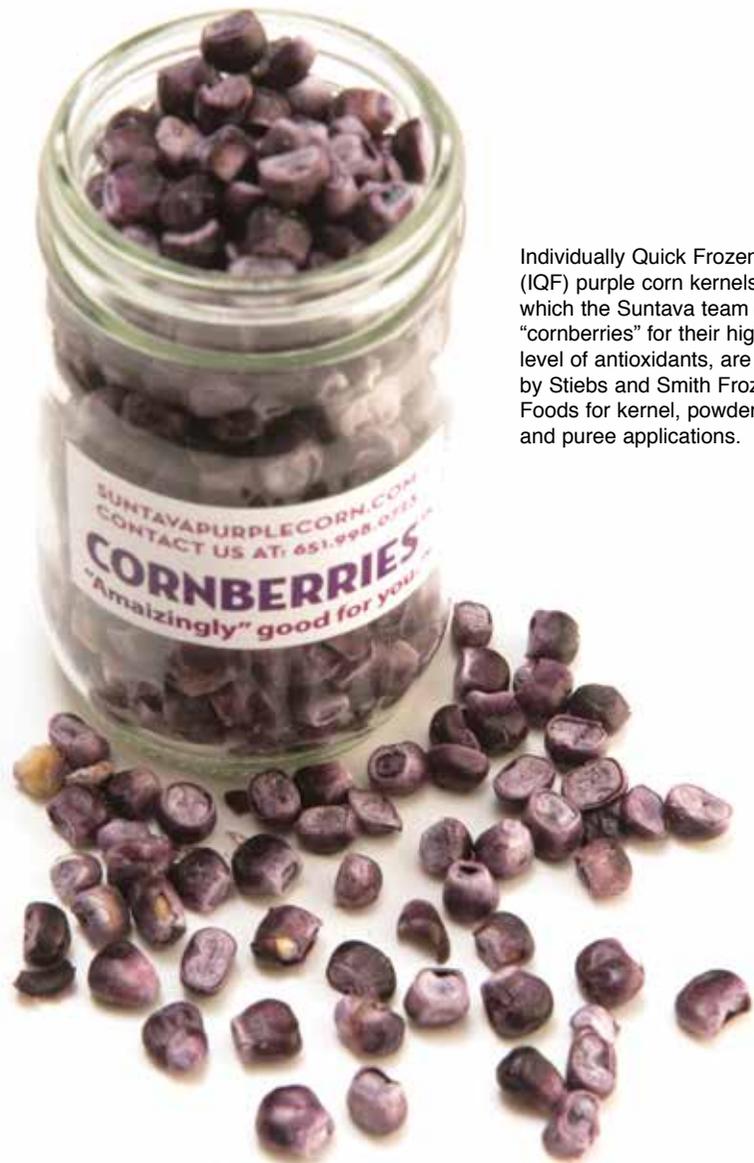
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MORE THAN A COLOR

Colorant from unique purple corn was just the beginning



Individually Quick Frozen (IQF) purple corn kernels, which the Suntava team calls “cornberries” for their high level of antioxidants, are sold by Stiebs and Smith Frozen Foods for kernel, powder and puree applications.

BY DAN LEMKE

Bill Petrich says he didn't know for sure how expansive the business could be when he became CEO of Suntava in 2007. Petrich was hired to build a fledgling business marketing products from a variety of purple corn the company's founders had developed.

Initial efforts focused on a natural red colorant extracted from the corn. But the business has become so much more than just a pretty color.

“This has gone in more directions than I could have ever imagined,” Petrich admits.

Suntava still supports the Sayela™ colorants as a natural alternative to the petroleum-based Red Dye 40 for the food and beverage industry, but it wasn't long into the company's existence that Petrich began paying greater attention to possible uses for the grain. Even though their proprietary process extracts purple color from the corn grain, there was plenty of vivid purple still in the meal. But color wasn't the only thing left in the corn.

A healthy option

Suntava colorants and whole grains are rich in anthocyanins, a powerful antioxidant. In fact, ounce for ounce, Suntava Purple Corn has double the antioxidant level of blueberries. The health benefits, combined with the unique color and versatility of the grain have opened numerous exciting opportunities for cereals, sweet and salty snack foods, craft brewing and even spirits.

Suntava Purple Corn is already used to make corn chips, tortillas, masa flour and more. In recent months, new partnerships have been formed, taking Suntava's unique purple ingredients to new markets.

In January, Cascadian Farm launched a Berry Vanilla Puffs cereal nationally. Cascadian Farm is a General Mills company that produces organic and non-GMO snack and cereal products. The purple berries in the cereal are made from Suntava Purple Corn because no artificial coloring is needed.

Suntava has formed a partnership with Stiebs and Smith Frozen Foods, two west coast companies who will produce and market individually quick frozen (IQF) kernels, freeze dried kernels, powder and purees. Stiebs is a California-based supplier of juices, concentrates, purees and nutraceuticals. This partnership opens the door for Suntava ingredients to be used in foods like salsa, frozen vegetable mixes, healthy snacks, purees and soup.

Briess Malt and Ingredients Company of Wisconsin is working with Suntava to produce, market and distribute purple corn nectar. Briess is North America's leading producer of specialty malts and value-added ingredients for the brewing, distilling, food and pet food industries. This partnership opens yet another door into the craft brew industry, health bar and natural sweetener markets.

For companies striving to market healthy, natural products with flair, Suntava ingredients are a perfect fit.

“In general, we've had a warm reception,” Petrich says. “It's taken time to get there, but companies are beginning to realize the benefits.”

A story to tell

Petrich says companies like both Suntava Purple Corn's color and nutritional benefits. Test results have shown that snacks, cereals, crackers and baked goods made with their corn provide from 18-35 milligrams of anthocyanins per one ounce serving, whereas studies have shown that the average American consumer gets about 12.5 milligrams per day.

Beyond the nutrition and the color, many companies and consumers are attracted to Suntava's story. The purple corn is a non-GMO variety, developed by Lee and Joann French of Lamberton, Minnesota. After years of traditional breeding using strains derived from ancient red maize, the Frenches developed the corn that is distinctively purple from root to tassel. The variety is now grown on thousands of acres in southwestern Minnesota as well as other parts of the country.

“The footprint of where we are growing the corn continues to expand,” Petrich says. “The corn is a very scalable and mobile product that can be grown in multiple regions.”

“We've got complete control of the seed from the breeding practices all the way up to the production, so our customers can be assured of a high-quality, consistent product each and every time they receive product from Suntava,” says Joel Bodin, Suntava vice president of business development.

The Frenches began working with AURI back in 2002, looking for help identifying potential commercial uses for the purple corn they'd developed. Other projects, including technical, laboratory and cost-share assistance occurred along the way, which Petrich credits for helping grow the business to where it is today.

“What we learned from our early work with AURI has allowed us to do the business development we otherwise couldn't have done,” Petrich says. “It's very, very helpful to know that we have them behind us.”

“It's very rewarding to see a project progress and grow and to know that we've been a part of that,” says Michael Sparby, senior project strategist for AURI. “Suntava is a classic example of someone taking an idea and making it a commercial reality. They have been able to truly develop their own product, and identify and carve out their own markets.”

A colorful future

Petrich says the first years of the company's existence were tough because they started operations at the front end of the economic recession. But he says they survived, got their name out in the marketplace and have been on a strong growth curve ever since. He says there are major companies that are working more Suntava products into their portfolios.

Suntava started with one product—the color—and has now expanded into nearly a dozen different products derived from their purple corn. Those products cut across a wide array of product categories with new opportunities emerging in areas such as nutraceuticals, functional foods and more.

“We always knew this had big potential,” says Petrich. “It's becoming bigger as we go because we're branching into areas that I would have never dreamt of when we started the business.”



Starting in upper left corner, moving clockwise: Suntava Purple Corn Flour, Meal, Snack Meal, Kernels and Grits. These are Suntava's main products.

SUNTAVA ON THE SHELVES



Purple corn pasta contains only natural colorants and is gluten free.



Popped purple corn chips contain a high level of antioxidants.



Cascadian Farms Berry Vanilla Puffs cereal are made using Suntava Purple Corn and contain no artificial coloring.

PHOTOS BY ROLF HAGBERG

It is becoming more and more common to find products containing Suntava on store shelves. The company is making inroads with food producers who recognize the health value and the aesthetic appeal of Suntava purple corn.

Next time you're looking to fill your grocery cart, keep an eye out for these retail products containing Suntava grains or colorant.

Mystic Harvest Purple Corn Tortilla Chips

Cascadian Farm Berry Vanilla Puffs Cereal

Simply Nature Popped Purple Corn Crisps
(Aldi's Markets)

Florence Street Bakery (Udi's brand)
Country Seeded Bread

Cesar Style Purple Corn Tortillas
(Fresh and Easy Market)

Home Style Artisan Purple Corn Tortillas
(Sprouts Market)



“THIS HAS GONE IN MORE DIRECTIONS THAN I COULD HAVE EVER IMAGINED.”

— Bill Petrich
Suntava CEO



AURI and Suntava

Idea to reality:

Identify potential food and beverage uses for Suntava Purple Corn, a conventionally-bred corn variety originating from ancient maize.

AURI's role:

Beginning in 2002, AURI worked to help identify potential uses for a variety of purple corn. The rich, purple corn is high in anthocyanins, which are powerful antioxidants and are present in both the colorant and the meal. AURI also provided cost-share assistance, technical laboratory assistance, conducted sensory panels and product testing to assist in getting Suntava ingredients into food products across the country.

Outcomes:

Suntava's Sayela™ colorants are used in many beverages as a replacement for petroleum-derived Red Dye 40. The grain is used in a wide range of products including chips, cereal, bread and more. In 2010, Suntava was named AURI's Ag Innovator of the Year. Their product line continues to grow as does their distribution.



Feed trials benefit swine, ethanol industries

BY LIZ MORRISON

Hog farmers around the globe are benefiting from AURI-funded research on feeding distillers grains, an important ethanol coproduct.

Feed trials at the University of Minnesota, supported by AURI, the Minnesota Pork Board and the Minnesota Corn Research & Promotion Council, are generating “powerful information” that is widely used by the pork industry, says Al Doering, AURI senior associate scientist and director of AURI’s coproducts lab in Waseca. Minnesota research is also helping to win international acceptance for distillers grains as a high-quality swine feed, Doering says.

Responding to the changing ethanol industry

Energy content of distillers grains is a major focus of the AURI-sponsored research— after the starch portion of the corn kernel is made into ethanol. This nutritious animal feed is usually dried and sold as distillers dried grains with solubles, or DDGS.

In the past, DDGS usually contained 10 to 12 percent corn oil, which supplies energy in livestock diets, says Gerald Shurson, professor of animal science at the University of Minnesota. In the last decade, ethanol plants have started extracting some of the oil from distillers grains, selling it as a separate feed ingredient or as a biodiesel feedstock.

In 2014, about 85 percent of ethanol plants were extracting distillers corn oil, according to the Renewable Fuels Association, a national organization focused on expanding the production and use of American-made renewable fuels and bioproducts worldwide. Today, the oil content of DDGS typically averages around 8 percent, Shurson says, although it varies widely by plant, ranging from 5 to 12 percent. This variability affects the nutritional value of the feed and makes it hard to formulate consistent diets, he says. Nutritionists and pork producers needed new tools to manage these changes in DDGS’ nutritional content.

With funding help from AURI and the corn and pork producers’ associations, Shurson and his research team devised and tested a set of equations to calculate the amount of digestible and metabolizable energy in DDGS from any given ethanol plant. Shurson found that the corn oil content of DDGS is not an accurate indicator of how many calories the pig can actually digest and use.

“Contrary to what most people believed, we found that we also needed to include other components of the feed, like protein and fiber, to determine the metabolizable energy content,” he says. “We conducted a series of experiments that demonstrated these effects and enabled us to develop energy prediction equations.”

Additional studies at the U of M quantified the effects of feeding swine diets containing lower-oil DDGS on pork belly fat quality and firmness. Reducing the amount of unsaturated corn oil in DDGS is actually an advantage for pork packers, Shurson says, yielding firmer belly fat, which improves the appearance and shelf life of bacon.

Shurson’s findings are now being used throughout the pork industry to formulate diets and maintain high dietary DDGS inclusion levels, Doering says. For example, NutriQuest, a leading Iowa-based animal nutrition company, uses Shurson’s energy equations as the basis for its weekly analysis of digestible nutrients in distillers grains from more than 140 U.S. ethanol plants.

This research has also been very valuable to the U.S. Grains Council, which is developing export markets for DDGS, says Tommy Hamamoto, manager of U.S. Grains Council operations in Japan.

Japanese hog producers, for example, don’t feed high levels of distillers grains — in part because of a perception that DDGS make belly fat too soft, Hamamoto says. The U.S. Grains Council is educating the swine industry abroad “on the characteristics and benefits of DDGS.”

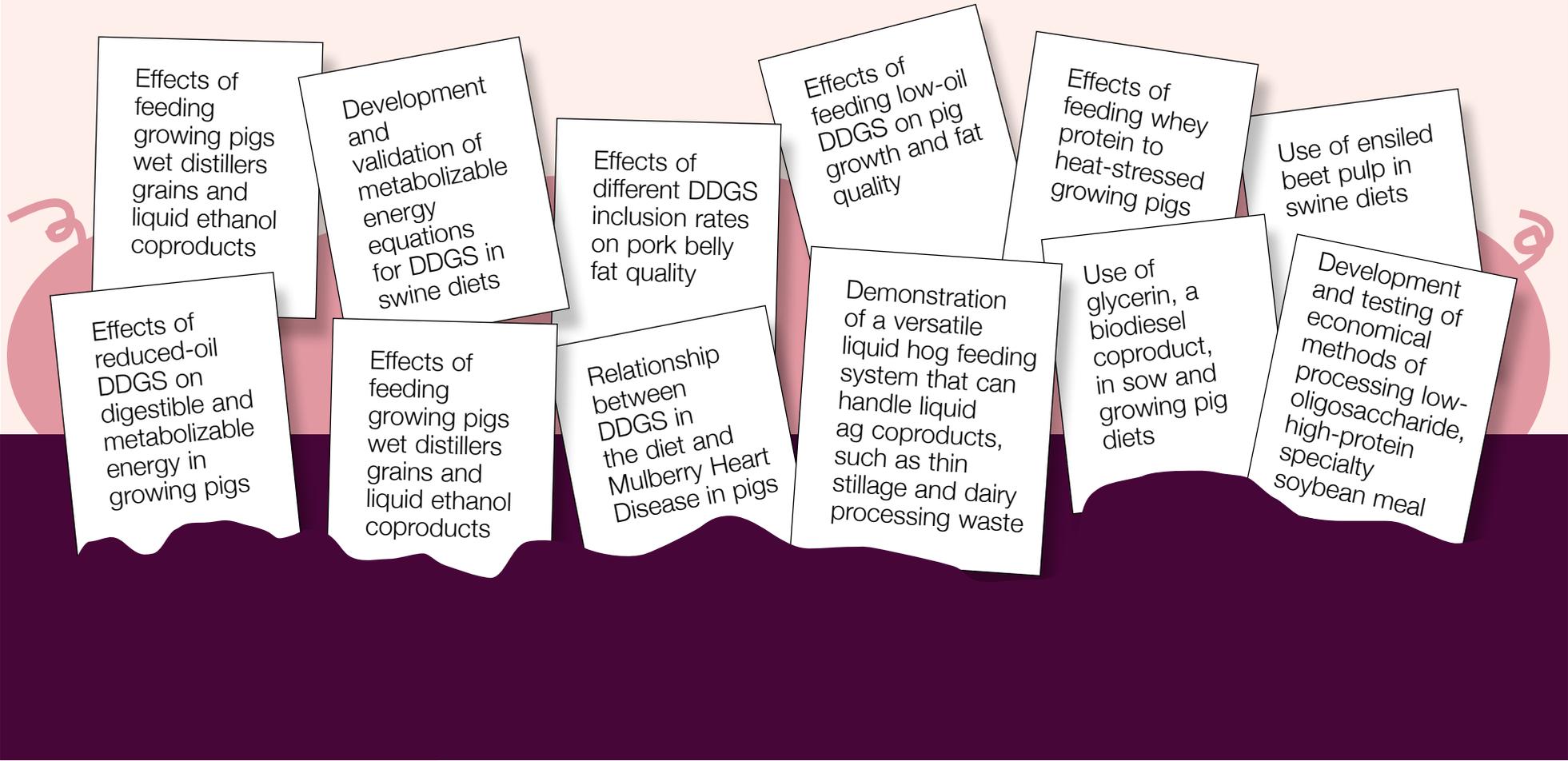
Shurson’s energy calculation equations and fat quality data have helped “manufacturers to understand the value of reduced-fat DDGS,” and encouraged them to offer distillers grains as an option for pork producers, Hamamoto says.

Exports of distillers grains surged to record levels in 2014, accounting for nearly one-third of U.S. production. But in Japan and other regions of Asia, “the use of DDGS has a lot of room to grow,” Hamamoto says.

AURI feed trials help add value to ag coproducts

AURI feed trials are aimed at adding value to agricultural coproducts, says Al Doering, AURI scientist in Waseca. The goal is to expand the use of low-value ag products and help farmers take advantage of the state's abundant supplies of alternative feeds, such as distillers grains.

The following are brief summaries of AURI-funded swine feed studies:



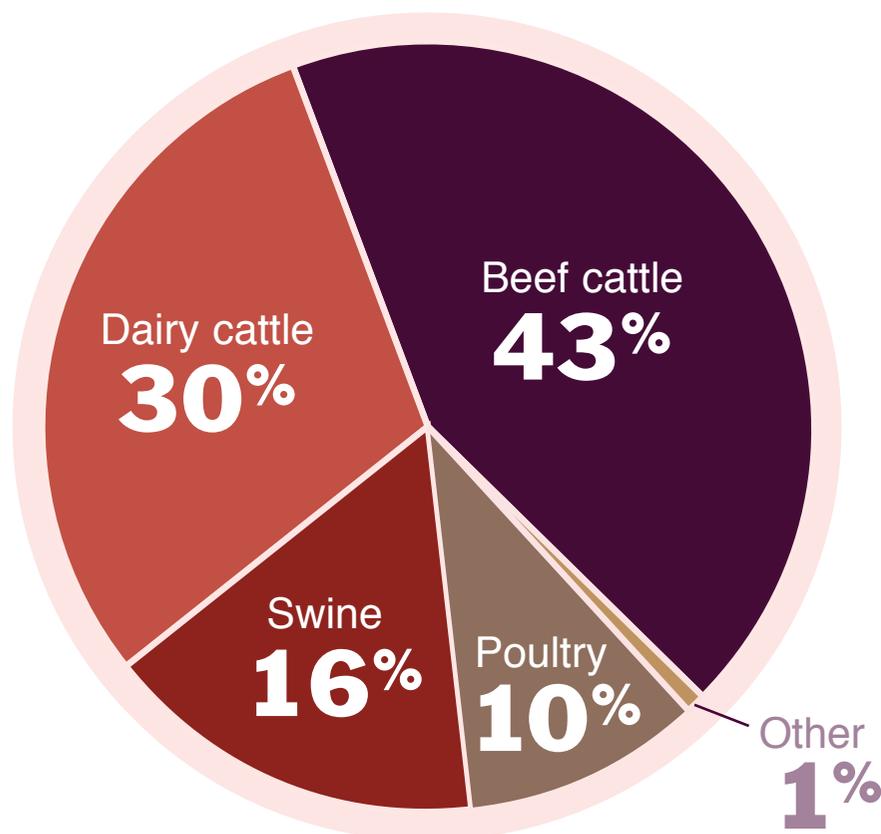
Further expanding the use of DDGS

- Another important study sponsored by AURI, the Minnesota Pork Board and the Minnesota Corn Research & Promotion Council dispelled industry fears about a possible link between DDGS and a nutrient deficiency in pigs called Mulberry Heart Disease, or MHD. Feeding trials at the University of Minnesota including sows and nursery pigs found no relationship between high levels of fat-damaged DDGS in their diets and MHD. In fact, no pigs developed nutritional deficiencies involved in MHD, Shurson says.
- Other significant research is laying the groundwork for new swine feeding systems that can make use of low-cost liquid or wet feed ingredients, such as corn distillers solubles, wet distillers grains and dairy processing waste. In studies at the University of Minnesota's Southern Research and Outreach Center in Waseca, pigs fed liquid diets that included wet ethanol coproducts grew as well or better than pigs fed a conventional dry diet, says research leader Sam Baidoo, associate professor, Department of Animal Science at the University of Minnesota.

These and other AURI-sponsored research studies are helping livestock producers make "informed decisions regarding corn DDGS in swine diets," Doering says. "They also help ethanol processors understand the value and impact of DDGS for livestock producers."

2014 US Distillers Grains Consumption by Species

The U.S. ethanol industry produces about 40 million metric tons of distillers grains, an important animal feed. Hogs eat a significant portion of this feedstuff. Pork industry consumption reached 16% of total production in 2014, up from 12% in 2012. AURI-sponsored research at the University of Minnesota is helping hog producers make informed decisions on DDGS use.



Source: Distillers grains marketing companies and Renewable Fuels Association



AURI and swine feed trials

Idea to reality:

Research was needed to overcome the barriers to increased use of corn ethanol coproducts in swine diets.

AURI's role:

AURI and its partners have funded many feed trials at the University of Minnesota to help pork producers successfully incorporate DDGS in pig diets.

Outcomes:

Research is increasing the use of corn ethanol coproducts in the pork industry, both in the U.S. and abroad. One of the most significant outcomes is the development of a DDGS metabolizable energy prediction model, now in wide use. Another set of studies dispelled a potential link between DDGS in swine diets and Mulberry Heart Disease.

Partners:

University of Minnesota, Minnesota Corn Growers, National Pork Board, Minnesota Pork Board

MEDITERRANEAN

BY DAN LEMKE

Americans love cheese. In fact, the USDA says U.S. cheese consumption is up 42 percent in the past 25 years. The average American consumes more than 33 pounds of cheese each year, still less than half of the nearly 72 pounds per year consumed by

people in Greece and nearly 53 pounds by the French.

Cheddar is still by far the best selling cheese in the U.S., but specialty and artisan cheeses are very popular, especially with millennial consumers.

ANTIGONE'S GREEK FOODS



Antigone's Foods owner Toni Bazakos (center), with her husband Mike (left) and AURI Food and Nutrition Scientist Donna O'Connor (right), display Antigone's Greek Foods cheese spreads.



AURI's Donna O'Connor (left) and other AURI scientists assisted Toni Bazakos (right) of Antigone's Foods with nutrition facts labeling, lab analysis, product stability and shelf-life testing.

Antigone "Toni" Bazakos grew up in a small village in southern Greece, a region famous for its Kalamata olives, olive oil and dairy products. She moved to Minnesota to finish high school and later attended the University of Minnesota to get her education degree. While there, she met her future husband, Michael, and has called the Gopher State home ever since.

Bazakos loves to cook and loves the traditional Mediterranean diet, full of taste, utilizing simple ingredients like extra virgin olive oil, dairy products, greens and grains.

"When I raised my kids in the 1970s, it was hard to find ingredients," Bazakos says. For more than three generations, her family has developed healthy recipes based on the Mediterranean staples. "I raised my family based on what I knew. Now that the kids are grown, I decided to provide these foods for people who might like them."

In 2012, Bazakos launched Antigone's Greek Foods, producing handcrafted feta cheese dips and spreads that are free of the hormone rBST. Antigone's currently offers a Greek Feta Dip made with a hint of mint and garlic, as well as a spicier Chipotle Feta Dip. She also makes a Kalamata olive spread with walnuts that is naturally vegan. The products are versatile and can be used as spreads and dips, in pasta salads, or as appetizers.

Bazakos worked with AURI's food science staff on product development, nutritional labeling, shelf-life testing and more. She operates her business at an incubator kitchen in south Minneapolis where she is producing her family's favorite recipes.

Even though Bazakos utilizes a commercial kitchen, the products are all handcrafted. She does everything herself, including filling containers. It's a fitting approach for her products.

"I want to produce good, simple products with healthy ingredients," Bazakos says.

Antigone's Greek Foods offerings are finding a strong reception in the marketplace. Products are currently available in more than two dozen Minnesota and Midwest Region food co-ops, whole foods stores and small grocery chains.

This wider distribution and growth has Bazakos looking to expand her business to the next step.

"I've put my heart into the lifelong practice of my family's traditions, and now here is the opportunity to share some of those traditions with others, too," Bazakos adds with a smile.



**AURI and
Antigone's
Foods**

Idea to reality:

Toni Bazakos wanted to market feta cheese-based spreads and dips.

AURI's role:

Scientific staff Donna O'Connor, Ranae Jorgenson and Charan Wadhawan provided nutrition facts labeling, lab analysis, product stability reformulation and shelf-life testing.

Outcomes:

Antigone's Greek Foods are part of a growing artisan cheese segment and are now in 27 retail outlets. Product information can be found at myantigone.com.

TASTE

Minnesota entrepreneurs share heritage and spread the love of cheese

“U.S. cheese consumption is at an all-time high and evolving,” says Donna O’Connor, AURI food and nutrition scientist. “One emerging trend is that consumers are reaching for artisan cheeses at a rapidly increasing pace.”

Two Minnesota entrepreneurs are more than happy to contribute to that growth with some unique, locally produced offerings.

PHILIA FOODS

Philia Foods owner Mike Rakes knows he’s gotten more than he bargained for with his exciting entrepreneurial venture. Before he began his foray into running a business, Rakes worked in the corporate world of finance and accounting.

“I loved the people; I just didn’t love the work,” Rakes admits.

Rakes was accepted into the MBA program at the University of Minnesota’s Carlson School of Management and began studying entrepreneurship and business. He did a micro-level business concept project marketing a traditional Greek spread recipe his sister had developed.

In 2012, he marketed the spicy feta spread at the Linden Hills Farmers Market during the summer as a hobby. The enthusiastic reception he received prompted him to ramp things up.

Rakes began working the business full time in 2014. He now has products in more than 70 Twin Cities area outlets.

“This really started as a pipe dream and all of a sudden people wanted my product so I decided to give it to them,” he says.

The Philia Foods name comes from the Greek root word for community love or friendship. Rakes, who is also Greek, is leaning on love of good food and personal connection to drive his business. His initial product offering was a common Greek restaurant appetizer, not usually found in stores.

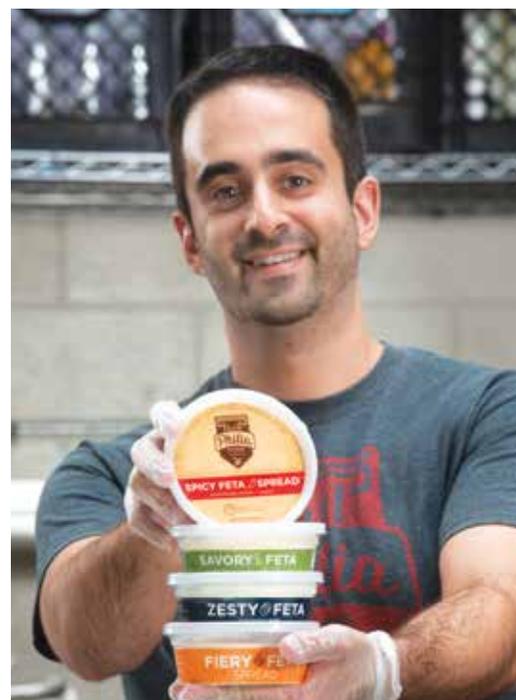
Philia Foods currently produces and markets four spreads made with cow’s milk feta cheese:

- **Spicy Feta Spread**, made with roasted red peppers;
- **Savory Feta Spread**, featuring basil and rosemary;
- **Zesty Feta Spread**, with cucumber and dill; and
- **Fiery Feta Spread**, blended with habanero peppers.

Rakes received assistance from AURI’s food science staff on nutrition facts labeling, as well as formulation review and a copacker list. He makes use of a commercial kitchen to produce his spreads.

Currently, Philia Foods products are available in all Twin Cities Kowalski’s, Lund’s & Byerly’s stores and numerous food co-ops around the metro area. But if Mike Rakes has his way, there will be more retail outlets to come.

“To be honest, this has been more than I imagined when I started in the summer of 2012,” Rakes says. “I thought it would be awesome if one grocer wanted it. Now that it’s in 70, I can’t wait to get to 700.”



Mike Rakes began Philia Foods as a hobby. Today it’s a thriving, full-time business.



In three years, Philia Foods has grown from its beginnings in the Linden Hills Farmers Market to sales in more than 70 Twin Cities outlets.

PHOTOS BY ROLF HAGBERG



AURI and Philia Foods

Idea to reality:

Mike Rakes took a family recipe from an entrepreneurship project to a commercial reality.

AURI’s role:

Food scientist Donna O’Connor provided nutrition facts labeling, product stability review, technical consulting and a list of copackers for the feta-based products.

Outcomes:

Philia Foods feta spreads are now in more than 70 Minnesota outlets, creating another market for locally-produced cheese. More information can be found at philiafoods.com.



Terroir Chocolate:

A network of local regional partners reaches in

BY JONATHAN EISENTHAL

The idea stage for Terroir Chocolate took place mostly in the basement of Kristin Mohagen's parents' farmhouse. When Josh and Kristin Mohagen—he with a degree in business and her with training at culinary school—were ready to take their dream primetime, they found a whole network of resources ready to help them.

First was Harold Stanislawski, who was then economic development director for the city of Fergus Falls. He's known Josh since he was a little neighbor boy. When Stanislawski heard about the business venture, he knew the Mohagens needed to talk to staff at the Agricultural Utilization Research Institute (AURI) to grow their business. As Stanislawski worked with the Mohagens, he himself transitioned to a position as project development director at AURI, with Terroir Chocolate as one of his first clients.

"Harold's encouragement from the beginning was huge," says Josh. "He helped us identify funding resources and connected us to a few media outlets that generated some excitement about us and what we could do."

Charan Wadhawan, a food scientist at AURI who has since retired, helped with nutritional analysis necessary for labeling and provided product shelf-life assistance and scale-up assistance. And now, another AURI scientist, Al Doering in Waseca, is helping the Mohagens develop a method for cracking their beans more efficiently. "We're trying to recover 20 percent of the bean that gets lost in our current process," explains Josh.

The city of Fergus Falls, a regional center 180 miles northwest of the Twin Cities, sees small business as the key to the community's future prosperity.

"Josh and Kristin are astute entrepreneurs," says Hal Leland, mayor of Fergus Falls. "They are really working toward a success with Terroir Chocolate...It's extremely exciting. It's great to see local people become involved and have a passion, and accumulate the know-how to have a successful business."

Leland credits AURI's technical support and a Minnesota Department of Agriculture Value-Added Producer Grant as essential to Terroir Chocolate's success. The funding helped the Mohagens afford their own commercial kitchen facility. From there sales volume grew quickly.

The Mohagens' got their facility set up in September 2014, and the business hit the ground running that November. Since the holiday season, marketing has been a major focus. Every weekend the couple hits new retail locations and spends hours giving out samples and winning new customers. The business grew from 15 to 50 retail sites in three months, including food co-ops, gourmet food shops and coffee shops. "Chocolate and coffee do pair very well," Josh says.

"We have to have the grassroots efforts that entrepreneurs can bring to us," explains Mayor Leland. "This will help create a job market and a business processing support throughout the whole community... And AURI will be a crucial partner."

What does the future hold for this fast-growing chocolate maker? Like a winery, the Mohagens foresee making Terroir Chocolate into a destination, as well as a place of production.

"One of the things that would be fun, that we really hope to be able to do for people, is to have a place where they can come and see the chocolate-making process," says Josh. "A lot of people eat chocolate but don't know how it's made or where it comes from. When people learn about chocolate firsthand, it creates a new way of looking at chocolate and an appreciation for what chocolate can be."

Read more about Terroir Chocolate on page 12.



Kristin and Josh Mohagen are creating artisan chocolate, using flavors from around the world, in Fergus Falls, Minnesota.



Josh Mohagen scoops cocoa nibs and husks onto a gravity table. This process is called winnowing and separates the husk from the usable cocoa nib.



Left, Kristin Mohagen is tempering chocolate bars. The tempering machine heats the chocolate up to 120 degrees and brings it back down to 87 degrees. This gives a beautiful sheen and snap to the bar.



It's all about the **PROTEIN**

Growing demand for protein provides opportunity for Minnesota businesses and farmers

HAROLD STANISLAWSKI,
PROJECT DEVELOPMENT DIRECTOR

Protein. It's a hot trend. But is it just a fad that marketers are using to drive sales? Facts show that there's more to it than that—protein increases energy levels, helps with muscle maintenance and weight management, curbs cravings for carbs and generally promotes a healthy diet. This information was just part of a vast amount of information on protein shared at the Bridge2Food Protein Course.

The good news for Minnesota farmers, businesses and consumers is that our state produces many of the world's protein resources, including soybeans, peas, canola, wheat, eggs, dairy and much more. And all of these vegetable proteins—as well as the animal proteins provided by poultry, beef cattle and pork—have a role in feeding a world growing population. In fact, by 2050, we're going to need 50 percent more protein than what's produced today, and we have to produce that protein on only about 4 percent more land.

One of the fastest growing commodities used for protein is peas. Pea protein usage is up 261 percent since 2010. Why the surge? Pea protein meets a lot of current consumer demands—including that it is gluten free and non-allergenic. Other emerging proteins include algae protein and protein from insects, which can be turned into protein flour. These have just begun to enter the market.

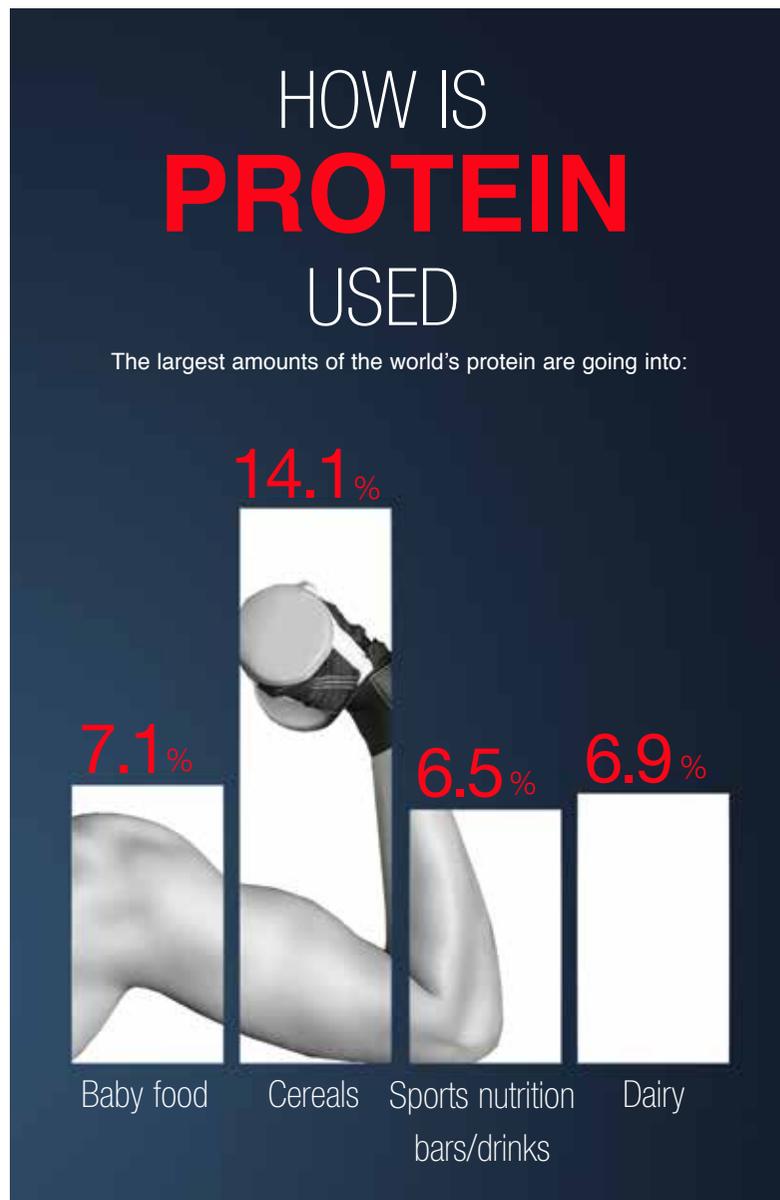
What does all of this mean for Minnesota farmers and businesses? For Minnesota farmers, this increased demand for protein means increased need for their commodities—especially whey protein from dairy products and soybean protein—two key Minnesota commodities that also have high amounts of protein. These two proteins are so functional and affordable they will continue to be pillars in the protein world.

The demand also poses opportunities for Minnesota businesses and entrepreneurs who find ways to deliver this protein in ways that meet consumers' desires for good taste and ready-to-eat, portable snacks. In fact, 12-15 percent of new product introductions have a soybean-based protein in it. Some new high-protein products include ready-made meals, soups and sandwiches, baking mixes and ice cream.

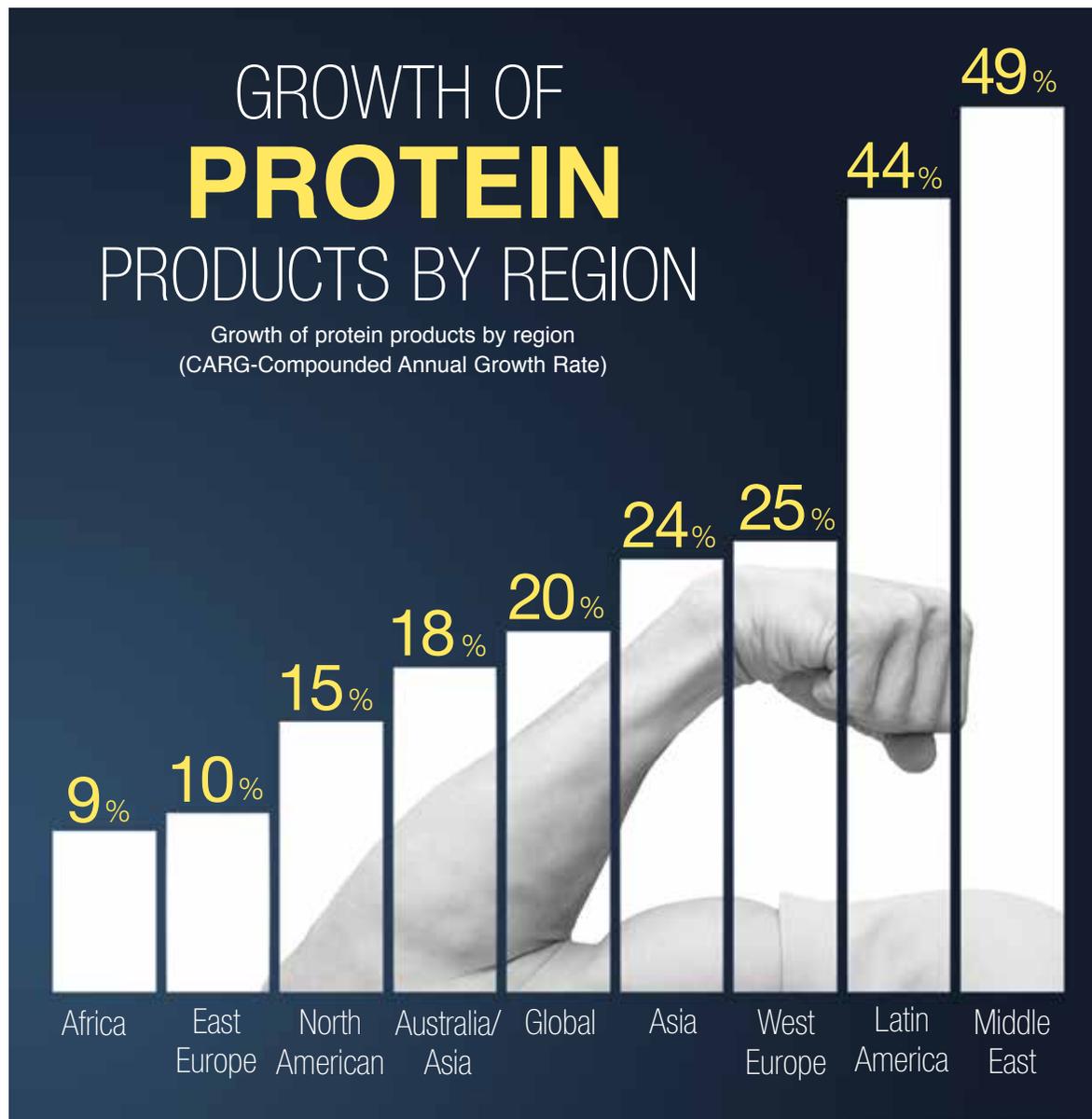
Here are just a few of the ways AURI is helping Minnesota commodity groups and businesses meet the growing demand for food:

- Hands-on scientific assistance to businesses and entrepreneurs who are trying to offer more protein in food products;
- The identification of commercialization opportunities for Minnesota farmers and businesses; and
- Research into fortifying proteins in animal feeds and other crops.

Our goal is to work with entrepreneurs, farmers and businesses to find ways to be a part of a solution to this global need for protein while at the same time creating economic growth for our state.



Source: Innova Global Insights – 2015 Bridge2Food Conference



Source: Innova Global Insights – 2015 Bridge2Food Conference



PHOTO BY ROLF HAGBERG

An unrelenting focus on mission

BY ADAM STRATTON
AURI INTERIM EXECUTIVE DIRECTOR

More than 25 years ago, the Agricultural Utilization Research Institute was created and funded by the Minnesota legislature to drive the development of new products and processes that use our state's agriculture commodities. Over AURI's many years of existence, there has been lots of change—in Minnesota's agriculture economy, the businesses we serve, the technology we use and the staff who deliver value to our clients. Throughout all the changes, though, AURI has held a laser-like focus on our mission: adding value to Minnesota's commodities to create economic growth.

Once again, AURI is in a time of change, as the Board of Directors is searching for a new executive director to lead the organization into the future. But through this change, our services to clients, partners and the state will continue uninterrupted.

As Board Chairman Ron Obermoller said: "We remain as committed as ever to fulfilling the mission given to us by the state legislature, and the Institute has a highly respected, professional and competent staff that will ensure uninterrupted service to our clients and stakeholders during this transition."

What are AURI's primary services?

- **Applied Research:** Through practical, applied research we identify emerging opportunities to add value to agricultural products. This information is publicly available in order to help entrepreneurs and businesses generate ideas for new products and processes.
- **Innovation Networks:** When deciding the feasibility of a new product or process, it is critical to have access to industry experts and a network of people. AURI's innovation networks, both formal and informal, enable industry to grow by bringing together groups of people around identified areas of interest.

- **Hands-on Scientific Assistance:** AURI scientists provide technical services and consulting in many areas including product and process development; product evaluation and testing; and sourcing materials equipment and services. Labs are available to clients for hands-on testing and development, and AURI scientists also travel to business locations for on-site assistance.

If you have any questions or need any assistance, you can find the right staff member to assist you at auri.org/about-auri/people/.

We are grateful for the continued support of our clients and stakeholders and look forward to serving you into the future!

ELSEWHERE IN AG INNOVATIONS

BY ASHLEY HARGUTH

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

Better way to peel tomatoes

USDA scientists are looking at the best way to peel tomatoes. In experiments using more than 6,000 tomatoes, results showed that removing the peels with infrared heating may offer advantages over other peeling technologies. This process is waterless, which is a benefit for drought-stricken areas, and there is also no expense of recycling the water. Processors who use sodium hydroxide or potassium hydroxide to peel tomatoes will also not have to worry about disposal. With the infrared process, there isn't overpeeling, where too many layers of skin are removed

USDA-ARS, January 29, 2015



Low-allergen soybean

Scientists at the University of Arizona and the University of Illinois have developed a new low-allergenic soybean, known as Triple Null. Along with providing an option for those with food allergies, Triple Null also has applications for livestock and agriculture, as soybean is the primary global input of vegetable protein for animal feed and aquaculture.

Oilseed and Grain, May 3, 2015



New textures from eggs

The Institute for Research in Food Science in Spain has investigated the potential of obtaining new textures from egg proteins using enzymatic hydrolysis. This will utilize the whole egg, both the white and yolk, providing added-value and healthy egg products along with the development of new food textures. The textures can range from smooth and creamy to rigid, along with a neutral flavor

Food Navigator, May 19, 2015



Growing corn made for ethanol

Enogen looks like any other corn, but it has just one purpose — making fuel. The first corn genetically enhanced for ethanol production is currently being utilized in six Midwestern ethanol plants.

There is an enzyme needed to refine biofuels that is now embedded in the corn instead of being purchased and added separately. This will produce more ethanol per bushel of corn and use less energy to do it. This allows ethanol plants to produce more ethanol (about a 2 to 6 percent gain in ethanol yield per bushel). Only about 15 percent of corn fed into an ethanol plant will need to be Enogen for the kernels to do their job.

Star Tribune, February 2, 2015

AURI'S CORE FOUR QUIZ

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

Food Products

One bushel of wheat can produce how many loaves of bread?

- a. 70
- b. 12
- c. 5
- d. 100

Answer: a

Renewable Energy

How much ethanol is produced in Minnesota?

- a. 110,000 gallons
- b. 790,000 gallons
- c. 212 million gallons
- d. 862 million gallons

Answer: d

Coproducts

What is pyrolysis?

- a. adding steam when making livestock feed
- b. burning of biomass
- c. thermochemical decomposition of organic material at elevated temperatures in the absence of oxygen
- d. addition of water during pelleting

Answer: d

Biobased Products

How many of America's daily newspaper use soy ink?

- a. 36%
- b. 90%
- c. 48%
- d. 72%

Answer: b

ABOUT AURI

The Agricultural Utilization Research Institute (AURI) helps develop new uses for agricultural products through science and technology, partnering with businesses and entrepreneurs to bring ideas to reality. AURI staff are skilled to walk clients through the entire development journey of bringing a new product or process from idea to reality.

Service Areas: What We Provide

Applied Research

Through practical, applied research we identify emerging opportunities to add value to agriculture products. This information is publicly available in order to help entrepreneurs and businesses generate ideas for new products and processes.

Hands-on Scientific Assistance

Scientists are available to provide consulting and technical services in the areas of:

- Product and process development
- Product evaluation and testing
- Sourcing materials equipment and services

Innovation Networks

When deciding the feasibility of a new product or process, it is critical to have access to industry experts and a science-based network of people. With a broad range of networks, AURI can help bring together the right people at the right time to help bring new products and processes to market.

Learn More

- Contact one of the AURI Offices to speak with a project development director about your business.
- Visit auri.org to see the latest research and learn about upcoming events.
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Terroir Chocolate:

Making a world of taste in Fergus Falls



PHOTOS BY ROLF HAGBERG

BY JONATHAN EISENTHAL

Two years ago, newlyweds Kristin and Josh Mohagen honeymooned in Napa Valley, ready for an adventure in wine-tasting. What really piqued their tastebuds, though, were the exquisite products of chocolate makers they found in the valley and in San Francisco.

Today, the Mohagens are creating artisan chocolate straight from Fergus Falls, Minnesota, with just two ingredients—cocoa beans from a plant whose scientific name “Theobroma Cacao” means “food of the gods” and sugar.

While the chocolate is made in Minnesota, the flavors come from all over the world. Where and in what soil a cocoa bean is raised changes the flavor characteristics. Even the vegetation that surrounds the cacao plant influences the flavors in the bean. The Mohagens made it their mission to create a ‘taste of place’ in their chocolate, hence the business name Terroir (tare-whar) Chocolate. “Terroir” means “sense of place” in French.

“We make 13 varieties of chocolate bars right now showcasing cocoa beans from seven different countries,” says Josh. When you go online to order at tasteofplacechocolate.com, or find their display in a growing number of Minnesota stores, you will encounter an ever-changing menu of taste adventures. “When we open a new bag of cocoa beans, we are ready to discover the nuances of flavor unique to that harvest.”

The Mohagens buy their 140-pound bags of cocoa beans directly from the farmers in Latin America and Africa. Fair and sustainable trade is an important value in their business.

“We have a Madagascar cocoa bean that is very citrusy, like a tart raspberry,” says Kristin. “Contrast that with a Guatemalan cocoa bean that is dark and earthy and has flavors to green tea. We used the same amount of sugar and cocoa butter in each of those, and they come out completely different.”

Though the ingredient list is short, the art of chocolate-making requires meticulous care and lots of patience. It starts with cleaning the beans, putting them through a fourth generation sanding mill, and hand separating them according to size. Then the beans are roasted; they must be tasted throughout the roasting to get the flavor just right. Once the beans are cracked, and the nibs and husks separated, the nib goes into a powerful grinder. It can take up to 10 days of grinding to transform the chocolate from the solid cocoa nib state to liquid chocolate.

“The first part of the grinding time is about crushing it and creating the chocolate, but the later part is about flavor development,” says Kristin. And that’s when the sugar gets added. When the mix has reached the right consistency, it’s put into a tempering machine that heats and cools the chocolate and gives it “sheen and snap,” Kristin explains.

The Mohagens also have milk chocolate and toffee in their product line-up. Wanting to highlight the terroir (taste of place) of western Minnesota, the Mohagens created a Maple Toffee using maple syrup from Camp Aquila on Star Lake. The Minnesota Maple Toffee has been a hit in stores especially during the holiday season.

Read more about Terroir Chocolate on page 8.

In this photo, the 100 percent cocoa has been ground for about seven days and the chocolate is “melanging” (French for “mixing”).

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