



Ag Innovation News

Apr-Jun 2019, Vol. 28, No.2

The newspaper of the Agricultural Utilization Research Institute



Next Generation Nutrition

Pages 4-5

PHOTO BY ROLF HAGBERG



The Economic Impact of AURI
Page 6



High Hopes for High Oleic
Page 8



New Packaging Guide
Page 10



New Board Members
Page 12



PHOTO BY ROLF HAGEBERG



Open Innovation and the Reverse Pitch: The future of problem solving

BY SHANNON SCHLECHT
AURI EXECUTIVE DIRECTOR

“

I BELIEVE THIS WAS
THE FIRST TIME SO
MANY LEADING FOOD
AND AG COMPANIES
CAME TOGETHER TO
USE THIS APPROACH

”

As you may have heard, AURI partnered with some of the world's largest and most influential food and ag companies last month to host a unique event dedicated to novel problem solving. The event was so unique, in fact, it turned the traditional model of pitching novel ideas 180 degrees by utilizing a “reverse pitch” in which food and ag companies gathered to share industry challenges and then invite an audience of researchers, entrepreneurs, producers and innovators to propose novel ideas to those problem areas.

While this is not a new model, pharmaceutical and technology sectors have employed it with great success in the past, it is a relatively new approach for food and ag, and especially from a collaborative platform. I believe this was the first time so many leading food and ag companies came together to use this approach—last month's event included: AURI, Cargill, Compeer Financial, Ecolab, General Mills, Grow North, Hormel Foods, Land O' Lakes Inc., Schwan's Company, Syngenta, TechStars Farm to Fork Accelerator, and the University of Minnesota.

Due to the wide range of challenges and opportunities facing Minnesota's ag and food industries, it was advantageous to bring together so many organizational networks to one juncture to broadcast these challenges to the widest audience possible. In this way, we could ensure there were no blind spots or missed opportunities for innovative proposals to these challenges. The participants now have the opportunity to forge new partnerships and to identify potential innovations or advance novel solutions benefitting both parties.

I'm a firm believer in taking new approaches to problem solving, like a reverse pitch, as essential platforms to further the future of innovation to benefit the agricultural industry. I'm sure we have all experienced situations where existing, but maybe not creative, solutions were applied to problems much to the detriment of a project. In being open to a new external model and approaching solutions from a new perspective, innovation can thrive and provide new answers that may have otherwise gone undiscovered. To me, that's the heart of innovation and a contributor to competitiveness.

If you were unable to attend the session in March, I encourage you to visit auri.org/openinnovation to explore the various challenges put forth. Then, if you believe you have a solution or new approach to one or more of them, fill out the online proposal application, which is available on the same page.

Board Spotlight

Q&A with board member
Jerry Hasnedl.



BY AURI

This quarter, Ag Innovation News highlights board member and vice chair Jerry Hasnedl. Jerry represents Minnesota Farmers Union and as AURI's Vice Chair he brings critical thinking and problem solving to board meetings, offering unique insight in the area of value-added agriculture.

AIN

In the current value-added and new uses environment, what opportunities do you see for AURI?

JH

I think it is fair to say that agriculture as an industry is at a critical juncture. Commodity prices are very low due to tariffs and restrictions on trade while input costs continue to be high. Farmers, processors, and traders are looking for ways to add value to the commodities they are handling and AURI's mission addresses those goals.

AIN

There's been a lot of value-added activity in the various ag and consumer sectors, what are some of the more exciting developments you've seen?

JH

Often it is hard to get your arms around the technology and the products that showcase AURI's significant contributions. Smude's, AURI's Ag Innovator of the year award winner, uniquely shows how AURI can make a significant contribution to the value of ag production. AURI helped with labeling, packaging, marketing, and other assistance. The microwave popcorn product which contains three ingredients is simple, tasty, and easy to explain.

AIN

Can you share any recent innovations in AURI's focus areas (i.e. food, coproducts, bio-based products, renewable energy)?

JH

In addition to the Smude's project, some very interesting work is being done in soybased road sealants, pet care products using wheat, adding value to byproducts of renewable energy as well as hops and malting projects for craft brewers are some of the initiatives that we have been involved with.

AIN

Are there any new partnerships or collaborations you'd like to see AURI establish?

JH

I would like to see AURI develop closer relationships with corporations such as AGP, Land O Lakes, and CHS. Cooperatives are owned directly by farmers so any projects or products we can enhance directly feed back to farmers. It also drives awareness of AURI.

AIN

You've now been a board member for a number of years—what are some of the highlights from your time on the board?

JH

My number one highlight and the one thing during my tenure that has had the most significant impact on our organization is participating in board decisions regarding the recruitment and selection of leaders at the organizational and board level. Notably the most important duty of any board is attracting and keeping strong leaders. Our choice of leaders has demonstrated our commitment to excellence and helped raise the awareness of our organization's impact and potential with the legislature and stakeholders. Likewise, the addition of new talent and resources has positioned our organization for significant growth and unleashed the potential to achieve our mission.

AIN

During the next year, do you have any goals you hope to achieve?

JH

During the next year and possibly the next several years I see a lot of stress and pressure on the soybean industry. I would like real focus on the road sealant project as well as continued research on projects that will add more value to soymeal and other by-products of the soy crush industry. I don't believe farmers can stand by and wait for the recovery of the export market. While AURI cannot fully restore the export quantity soybeans reached prior to 2018, we can lead and collaborate with the soybean industry to increase domestic use and this demand should raise the commodity price on the farm.

AIN

What are your thoughts on AURI's future? Where do you see the organization going in the next 5 years?

JH

My vision is for our budget to double. State borders do not exist when it comes to determining the price a farmer receives at the elevator or processing plant. Therefore, I see AURI becoming a more regional organization. This will really test our ability as a board to govern.

AIN

What has been the most exciting elements of your time on the AURI board?

JH

There is no question in my mind. The people that make up the organization (AURI staff and fellow board members) keep me motivated about agriculture and Minnesota.



Sanos Nutrition CEO Manuel Santana (L) and AURI Microbiologist Dr. Jimmy Gosse (R) have developed a high density yeast product for animal feed.

Next Generation Nutrition

Innovative Process Generates High Protein Feed

BY DAN LEMKE

Big ideas can come from very small beginnings. In the case of one Minnesota company, fermentation of a low value agriculture byproduct is the foundation for an innovative process that yields high-protein feed ingredients.

Minneapolis-based startup Sanos Nutrition plans to produce amino acid-balancing single-cell protein ingredients for animal feed. The ingredients would be sustainable sources of highly nutritional proteins derived from yeast, rather than from fish meal or spray dried plasma, which are frequently used today.

In a system similar to the production of baker's yeast, Sanos uses a controlled aerobic fermentation process to produce its high density yeast products.

"The output of the process is a dried, inactive yeast product similar to nutritional yeast," says Sanos Nutrition CEO and founder Manuel Santana. "We anticipate that by combining additional process modifications with genetic editing, we can achieve levels of protein greater than the 50 percent currently produced."

Not only can the process deliver high protein ingredients, the process also allows Sanos to produce targeted nutritional profiles.

"Different amino acid profiles that are more specifically tailored to each specific animal species and type of diet are also possible," Santana adds.

AURI Microbiologist Jimmy Gosse helped develop the concept while working on a project for the Minnesota Soybean Research and Promotion Council. After conducting preliminary research, Gosse spearheaded the efforts to enable Sanos to obtain the technology from AURI and incorporate

in 2017. Sanos Nutrition committed to develop a business with the intent to commercialize the process. In addition to his AURI duties, Gosse is also Chief Technology Officer for Sanos Nutrition.

"Our products are positioned to be cost-effective, when compared to other single-cell proteins specifically grown for feed applications," Gosse says. "We have validated the technology at the lab scale and believe we can be competitive selling our product into the local swine market by targeting starter feeds."

"We can produce as much as 100 pounds of protein or more per day using only one pound of yeast."

Sanos Nutrition CEO and founder Manuel Santana

Gosse says starter diets have the most stringent dietary requirements because they are critical for establishing the animal's overall performance, and for achieving producer profitability.

"With the potential to have a very low cost of production combined with the ability to tailor the amino acid profile to match the needs of the swine nutritionists, Sanos is uniquely positioned among its competitors in its amino acid balancer product," Gosse says.

Sustainable Process

In addition to adding value to lower-value ag byproducts, Santana says the Sanos Nutrition process is very sustainable. He says the amount of energy, water, land, natural resources and fertilizers that can be saved by using aerobic fermentation to produce high protein ingredients is substantial.

"Given the rapid and efficient growth of micro-organisms, we can produce 100 pounds of protein or more per day using only one pound of yeast," Santana explains. "We are also diverting a low-value feedstock that has no food value into a higher product that re-enters the supply chain as a highly nutritious ingredient."

"There is also the impact on global transportation," Gosse adds. "We could produce our proteins anywhere in the world where animals are grown and oily crops are produced."

Gosse says that process flexibility could help displace the need for fishmeal, which is processed and shipped all over the world from already stressed ocean fisheries.

"The most unique aspect of their proprietary work is the ability to add significant value to a low-value byproduct that is produced in Minnesota and transform it into a feed product that is in demand and that is not produced in sufficient quantities in Minnesota today," says AURI Executive Director Shannon Schlecht. "It is the science and understanding of how to fill market gaps that have commercial potential."



Sanos is uniquely positioned among its competitors in its amino acid balancer product.

“The original conversations that led to the development of Sanos Nutrition’s proprietary process began as part of AURI’s innovation network meetings.”

Jennifer Wagner-Lahr, AURI’s Senior Director of Innovation & Commercialization

Cleantech Open

Sanos Nutrition and their innovative process were recognized in late 2018 as the Cleantech Open Midwest award winners. The Cleantech Open is the oldest and largest clean technology startup accelerator program in the world, with the mission to find, fund, and foster entrepreneurs with ideas to solve the world’s greatest environmental and energy challenges.

Through the annual business competition and accelerator program, Cleantech Open connects startups with the people and resources that will accelerate their success and provides a national platform for public visibility. Cleantech Open Midwest Co-Director Garrick Villaume says Sanos Nutrition exhibited all of the desired attributes to make them worthy recipients.

“It was the combination of their technology and product solution, the substantial sustainability impact of their approach, and the experience and qualities of the principals,” Villaume says.

Villaume says Sanos Nutrition demonstrated innovation and offered a unique model that shows true business potential.

Santana says he was encouraged to apply to the Cleantech Open after networking with other entrepreneurs who were interested in the sustainable ag and food space. He listened to their encouragement and last spring submitted an application.

“The Cleantech Open award provided us with validation that our efforts are getting recognized and we are on to something,” Santana says. “At the same, time, it keeps our motivation high to deliver on our goals and try to move to commercial scale faster.”

“The ability of Sanos to articulate their innovation and illustrate a commercial opportunity at this early stage of their effort indicates both interest in their sustainable approach to helping feed the world as well as the commercial viability of their efforts,” says Schlecht.

“We believe it was the right time for us to follow a structured program to refine our business model and seek customer feedback at a time when many activities should be made and resources are limited,” Santana adds.

Budding Success Story

Jennifer Wagner-Lahr, AURI’s Senior Director of Innovation & Commercialization says the original conversations that led to the development of Sanos Nutrition’s proprietary process began as part of AURI’s innovation network meetings. These events are designed to identify emerging opportunities that AURI and its clients could pursue.

“It’s great to see a concept that came through the AURI ideation process take shape,” Wagner-Lahr says

Santana says AURI is a valued resource that has helped Sanos Nutrition grow and develop.

“AURI has been a great business partner for us. We have been able to leverage AURI’s expertise and network in many areas, most importantly in the ag community and with high level research institutions,” Santana says.

Wagner-Lahr sees substantial opportunity for Sanos Nutrition’s ingredients to be included in feed rations for nearly any animal that needs protein in their diet, including pork, poultry, aquaculture and dairy.

“I think they’re on to something,” Wagner-Lahrs says.

Sanos has already been recognized for its innovation and potential, but Santana says the company has bigger ambitions that they are actively pursuing.

“From the onset, we wanted Sanos to become a part of the fabric of the Minnesotan ag space,” Santana contends. “While we have great aspirations for how our product can benefit the global animal nutrition, we also want to do it with our local community.

“Over the next 30 years, agricultural output must more than double to keep up with population growth. We believe that ingenuity and creativity will allow us to achieve more with fewer resources and make a better world for future generations.”



Sanos Nutrition’s products are positioned to be cost-effective, when compared to all other single-cell proteins specifically grown for feed applications.

“Over the next 30 years, agricultural output must more than double to keep up with population growth.”

Sanos Nutrition CEO and founder Manuel Santana

To learn more about Sanos nutrition, visit their website at www.sanosnutrition.com.



Sanos Nutrition and their innovative process were recognized in late 2018 as the winners of the Cleantech Open Midwest, which is part of the oldest and largest clean technology startup accelerator program in the world.



AURI's quantifies its economic im

BY DAN LEMKE

AURI's mission is to foster long-term economic impact for Minnesota through value-added agricultural products. It measures its success by looking at the number of projects opened and completed in a given year, new products created, additional commodities utilized and the economic impact it had on the state.

To that end, AURI contracted with the University of Minnesota Extension (UME) to quantify its economic contributions to the state. To accomplish this, a study was conducted titled "Economic Contribution of Projects Leveraged with AURI Assistance: Fiscal Years 2011-2017", which analyzed economic activity generated by businesses receiving hands-on assistance from AURI.

Economic contributions produced by AURI were dynamic and widespread, with the impact explicit in five key metrics used to evaluate progress, including: annual sales, projected sales, capital investments, planned capital investments and created or retained jobs.

Key Findings

Businesses receiving AURI assistance directly created \$76.9 million of economic activity each year between FY 2011 and 2017. These businesses created 605 jobs and paid an estimated \$6.5 million in labor income.

Businesses plan to create and retain an additional 606 jobs in the next five years. Additionally, clients that received AURI assistance project the generation of a total estimated potential of \$157.8 million in economic activity, including 966 jobs and \$28.2 million in labor income.

To download a copy of the full report, [visit auri.org/economic-contribution](http://auri.org/economic-contribution).

Three Primary Services

AURI offers three primary services to sow the seeds for success: Applied Research Services, Innovation Networks, and Hands-on Scientific Assistance. Each of these approaches are applied uniquely to meet needs of businesses and entrepreneurs hoping to improve their products and technology. In tandem, these methods fill knowledge gaps by identifying barriers and solutions to spur innovation in the state of Minnesota and beyond. As the report shows, this creates revenues, expenditures, and jobs that positively impact the economy.

1

Opportunities for adding value to Minnesota agriculture can be like finding a needle in a haystack. That's why AURI conducts extensive research and exploration of relevant subjects and themes within selected focus areas. These **Applied Research Services** uncover a plethora of useful public information to help generate new ideas. Specifically, this work produces three types of outcomes: research reports, tools, and statewide initiative reports.

2

Innovation Networks bring stakeholders together around shared areas of interest, allowing both formal and informal groups to assist one another and advance new ideas in the agricultural field. AURI project development teams work with clients to connect them with pivotal thought leaders and resources to bring a product to market or disseminate research to a target audience. Popular innovation networks include Industry Thought Leader meetings, Forums and Roundtable events.

3

AURI also helps businesses achieve their goals by providing **Hands-on Scientific Assistance** to entrepreneurs and businesses. Perhaps the most expansive service offered by AURI, it helps bring ideas from development to commercialization through consulting and technical assistance every step of the way. Areas of assistance are categorized as follows: product and process development; product evaluation and testing; sourcing materials, equipment and services.

AURI provides these services across four focus areas: biobased products, renewable energy, coproducts, and food. The biobased and renewable energy focus areas work to replace traditional petroleum-based ingredients with agricultural products. Coproducts works to turn processing waste into marketable products. The food focus area provides small businesses and agricultural producers opportunities to create new products.

Annual Operational Economic Contributions

Jobs created and retained, along with new sales generated, are considered operational contributions. Businesses receiving AURI assistance benefitting the economy in this way saw impressive figures when totaling direct, indirect, and induced effects.

\$

Businesses generated **\$141.8** million in economic activity each year

\$

935 jobs were supported

\$

\$26.3 million in labor income across the state

Looking ahead through the next five years, businesses receiving assistance predict operational contributions will continue producing benefits. AURI assistance is projected to produce significant positive results, including generating \$157.8 million in economic activity, supporting a total of 966 jobs and \$28.2 million in labor income.

Impact Report

Impact on the state of Minnesota



“AURI is committed to delivering positive economic impact to the agriculture industry and the state’s economy. We track the direct impact of AURI’s programs on the clients we serve, but that doesn’t tell the whole story,” said Senior Director of Strategy Management, Lisa Gjersvik. “We knew the impact to the state’s economy was greater than the direct impacts reported by clients and we were excited to obtain research that provided a more holistic view of AURI’s work and its far-ranging effects.”



Short-Term Capital Investment Economic Contributions

Capital investments by AURI-assisted businesses will generate short-term economic contributions, dissipating once a capital investment project is complete. Similar to annual operational contributions, short-term capital investments produce impressive figures when totaling direct, indirect, and induced effects. Businesses generated a total \$168.8 million in economic activity, supported a total of 1,010 jobs, and produced \$68 million in labor income. These results are undoubtedly significant and they’re tracking to continue in the future.

Looking ahead through the next five years, between 2018 and 2023, businesses that received assistance predict capital investments will continue producing benefits. Totalling direct, indirect, and induced effects, AURI assistance is projected to produce significant positive results. Businesses will potentially generate a total \$261.5 million in economic activity, likely support a total of 1,570 jobs, and could produce \$105.2 million in labor income. Short-term capital investments have and continue to be effective, similar to operational contributions. Both types of economic contributions are important, especially given the context of AURI-leveraged projects to the economy.



AURI-Leveraged Projects in Context of the Economy

Minnesota has been and remains a top agricultural state. Its economy depends heavily on the agricultural industry. Agriculture is one of the top three industries in either output production or job creation in the regions explored by the study. That’s why AURI’s work and its economic contributions are critical and significant to both businesses and the state’s economy at large. Combining both annual operational contributions and short-term economic contributions of capital investments, AURI-assisted projects contributed an estimated \$310.6 million and 1,945 jobs to the economy through FY 2011-2017. AURI is poised to further its economic contributions moving forward.



Moving Agriculture Forward Into the Future

AURI continues to improve and develop new methods for driving economic impact through knowledge gathered from UME’s report. This insight positions AURI for many opportunities to advance new uses for agricultural products through science and technology. Objective and anecdotal information forecasts continued success for collaborative ventures moving forward. Particularly, AURI’s commercialization services program will be utilized to greater effect in the year ahead.

“This research clearly shows there are major benefits to assisting businesses facing technical constraints in utilizing our commodities and agricultural products. Results indicate that the commercialization services program needs to be continued and maintain its status as a key strategic offering of AURI,” said Executive Director, Shannon Schlecht. “This program spurs both short-term and long-term impacts with new capital investment having a major short-term impact on a direct and indirect basis to the economy. Additional commodity utilization and resulting new annual sales will also produce longer term impacts through generated economic activity.”

The agricultural landscape is always changing, requiring AURI to constantly adapt. The organization creates plans and strategies founded on evidence, routinely looking at shifts in the industry and new ways to advance ideas that utilize the crops grown here. UME’s valuation is a significant factor in ensuring progress, though AURI will continue seeking additional information to expand and improve its array of services. There’s much to be excited about as AURI is on course to deliver positive economic outcomes for its partners, and the state at large.

“AURI’s strategic plan is a living document. We routinely turn to our strategic imperatives to make sure we are working on what is important to our clients, and our partners,” said Planning & Government Relations Director Dan Skogen. “UME’s valuation provides resourceful knowledge that proves we’re on the right course. It shows from an organizational standpoint AURI does a good job of applying its founding statutes to its mission and strategic plan, engaging producers, entrepreneurs and small businesses to create new wealth in all corners of the state.”





HIGH HOPES for High Oleic

FDA Action Good for Next Generation Soybean Oil

BY DAN LEMKE

Soybean oil was once the gold standard for cooking oil, garnering a large share of the domestic market. It was in abundant supply and the strong oil markets helped support the price of soybeans.

More than a decade ago, an issue with trans-fats changed the equation and started a chain reaction that devastated the soybean oil demand. However, recent action by the U.S. Food and Drug Administration (FDA) could open the door for a next generation soybean oil to get back into the food, frying and cooking market in a big way.

To make soybean oil more solid, provide longer shelf-life in baked products and offer longer fry-life for cooking, it had to be hydrogenated. Trans-fats are formed through hydrogenation, which converts the liquid into a solid fat at room temperature.

According to the FDA, eating trans-fats raises the level of low-density lipoprotein (LDL) or “bad” cholesterol in the blood. And an elevated LDL cholesterol level has been shown to increase the risk of developing heart disease.

The trans-fats issue had a major impact on the nation's soybean industry and farmers. Soybean oil lost an estimated 5.5 billion pounds of demand from U.S. food companies as a result and soybean processors were left to find markets for billions of pounds of soybean oil.

Facing the Future

Soy industry leaders and seed companies saw the trendlines and were in dire need of opportunities. One option was to invest in the development of high oleic soybeans.

As the name implies, high oleic soybean oil contains a higher level of oleic acid than conventional soybean oil. Oleic acid is an omega fatty acid. High oleic oil offers food companies increased functionality, such as extended fry life, increased stability and a neutral flavor profile, making it ideal for frying, sautéing, and providing baked goods and snack foods without hydrogenation.

Just as earlier FDA actions spelled trouble for soybean oil, a recent announcement from the organization may help high oleic soybeans recapture some of what was lost.

In November 2018, FDA authorized the use of a qualified health claim citing that oils high in oleic acid may reduce the risk of coronary heart disease. Food companies with existing products that meet FDA requirements can consider adding the health claim to labels of foods made with the ingredient and brands seeking to source heart-healthy ingredients for emerging products can test high oleic soybean oil in their formulations. The FDA statement didn't specifically mention high oleic soybean oil in its authorized health claim, but it applies to edible oils containing at least 70 percent of oleic acid per serving.

"High oleic soybean oil has a high level of oleic acid which is a mono-unsaturated acid," says Lolly Occhino, AURI Food and Nutrition Scientist. "High oleic soybean oil has about three times as much oleic acid as conventional soybean oil and a similar amount to olive oil. The FDA Qualified Health Claim pertains to edible oils with at least 70 percent oleic oil. The oleic acid content in high oleic soybean oil exceeds 70 percent and can be as high as 75 percent. In addition, high oleic soybean oil is low in saturated fat and since it does not need to be hydrogenated is trans-fat free."

The FDA statement extends to a number of specific edible oils including high oleic versions of sunflower, safflower, canola, olive and algal oil. High oleic soybean oil will face market competition from those oils, but the authorized health claim gets soybean oil back in the game.

"Unfortunately, the FDA statement did not specifically call out high oleic soybean oil in its list," says Kim Nill, director of market development for the Minnesota Soybean Research and Promotion Council (MSRPC). "If the soy checkoff organizations can publicize enough the fact that high oleic soybean oils such as Plenish®, TruSoya®, Vistive Gold®, and Calyxt® oils also meet this FDA category criteria, it might help persuade food manufacturers to switch to utilizing those high oleic soybean oils and thus create more demand for those soybeans."

Consumers Care

Health benefits are increasingly important to health-conscious food consumers. The FDA qualified health claim is a plus for any food company using high-oleic oils.

"I think consumers are becoming savvier, and are following headlines about foods," Occhino adds. "They are more selective regarding their food choices. They are demanding products that taste good but also provide health benefits or that lack the negative attributes such as foods high in cholesterol or sodium."

AURI Staff handed out samples of foods cooked in high oleic soybean oil at FarmFest in 2018. Ben Swanson, AURI food and nutrition scientist, said "people were loving the fact that the oil comes from soybeans grown in Minnesota. The oil performs as well as other high oleic oils on the market and it tastes good."

"Consumers are increasingly interested in the nexus of food and health and seek more information about the food they consume," explains AURI Executive Director Shannon Schlecht. "Recognition by the FDA of the health benefits of high oleic oils provides more information for consumers wanting to make informed decisions."

Farmer Opportunity

To reach mass markets with high oleic soybean oil, there needs to be adequate soybean production. Nill says Minnesota farmers are planting a growing number of acres to high oleic varieties. Approximately 30,000 acres of high oleic soybeans were grown in Minnesota during the 2018 growing season, according to Nill, with another 120,000 acres grown in other states.

Not only can Minnesota farmers grow high oleic varieties, the state also has the capacity to crush the soybeans. Nill says the output of 25,000 acres of high oleic soybeans were crushed and the oil refined in Minnesota during 2017. That number grew to 30,000 acres of high oleic soybeans processed in Minnesota in 2018.

In addition to recapturing lost market share, high oleic soybeans could help create new market opportunities and mitigate some of the current price reductions caused by export disruptions.

"The current soybean trade and export challenges have made clearer than ever before the benefits of having as many, and as diversified as possible, markets for all soybean oils," Nill states.

Seal of Approval

The new health claims may motivate consumer packaged goods and private label brands to consider reformulating products, such as salad dressings or bottled vegetable oils, using high oleic soybean oil," says Dan Corcoran, chairman of QUALISOY, a third-party collaboration among the soybean industry. "This announcement serves as an opportunity for those companies, as well as high oleic soybean oil suppliers and distributors, to call the health claim out on packaging to help drive sales."

"As farmers, we take joy in providing Americans with an ingredient that has the potential to improve nutrition and prevent chronic disease, so the news of the qualified health claims is a source of pride for all U.S. soybean farmers," adds Lewis Bainbridge, United Soybean Board chair and farmer from Ethan, South Dakota. "High oleic soybean oil is a sustainably produced crop, and consumers and the food industry alike can be confident that they are serving a quality ingredient to their families and customers."

To learn more about high oleic soybeans, visit www.qualisoy.com or www.unitedsoybean.org/topics/high-oleic-soy/.

AURI Offers Free Packaging Guide for Scaling Food Businesses

BY AURI

As part of fulfilling our mission to foster longterm economic benefit for Minnesota through support of value-added agriculture, AURI often assists entrepreneurs in commercializing their innovative new products or businesses. One of the core challenges most entrepreneurs face is the transition from self-manufacturing and distribution to manufacturing and distribution through a professional supply chain. In response, AURI, in partnership with the Minnesota Department of Agriculture, have created the “*Packaging Guide for Scaling Food Businesses*” to help entrepreneurs navigate the complexities of successfully scaling their businesses.

Most packaged food businesses start in a similar manner, with an entrepreneur producing at home or in a shared commercial kitchen, hand packing products into relatively simple, often store-bought packaging, and selling at a farmer’s market or self-distributing to a handful of stores. However, as these businesses grow, the form and function of their packaging must evolve.

Whether the business will continue to self-produce or enlist a contract manufacturer or co-packer, the packaging must adapt to support distribution through a professional supply chain, allow retailers to effectively merchandise the

product, and differentiate itself from competitive products on the shelf. While every business and product are unique, there are many common packaging considerations that will help an entrepreneur as they seek to scale their business. These considerations are generally broken into three primary groups following a chronological order through the supply chain, including food protection and safety, interaction of package and product, and visual differentiation.

Food protection and safety – ensuring the package helps maintain desired product shelf life, physical integrity, and trust in the safety of the finished product.

Protection through the supply chain – aggregating the product into primary and secondary packaging and presenting the product in a manner that satisfies each member of the value chain (e.g. distributors, retailers and end users).

Differentiating in the marketplace – ensuring the finished, packaged product delivers the intended message to effectively compete in the marketplace.

The guide seeks to bring awareness and empower food entrepreneurs with knowledge to address common issues in these specific categories:

Physical protection of the product
Food safety
Impact of packaging on a product’s shelf life
Definition and importance of a code date
Consumer considerations in selecting packaging
Retailer considerations in selecting packaging
Differentiation through packaging in the marketplace
Labelling requirements
Getting a UPC
Controlling costs

The guide is available for download in pdf format on the AURI website at www.auri.org/focus-areas/food/, along with a short video companion meant to reinforce some of the more abstract concepts addressed in the guide. Should you care to discuss further with an AURI representative, please contact us via the web at www.auri.org/contact/ and someone from the food team will connect with you.

AURI Offers Cold Press Solutions to Entrepreneurs

BY AURI

In today’s consumer market, where customers are just as concerned with production practices as they are with ingredients, cold pressed foods are seeing a surge in popularity. This is due, in large part, to the positive perception of cold pressed juices, oils and other consumables compared to other common extraction processes. The prominence of cold pressing information on packaging has also increased significantly over the past two years and some stores are developing cold press only sections in their produce departments.

What is cold pressing

Cold pressed juices or oils are made by applying thousands of pounds of pressure to a fruit or seed with a hydraulic screw press. This pressure allows the press to extract the maximum amount of liquid without additional heat or chemicals.

How AURI can help

AURI is in a unique position to help small businesses and entrepreneurs looking to innovate in the oil seed and consumable oil markets thanks to its coproducts lab in Waseca, MN. One of the lab’s many resources is a M70 single-barrel oil press with the ability to cold press a variety of common and emerging oil seeds. AURI added this new equipment in 2017 after receiving requests for this type of assistance.

This resource is especially helpful to entrepreneurs during the early stages of their product’s development because the press can further initial ideas. Most importantly, utilizing the coproducts lab press can establish process efficiencies and determine baselines for future stage upscaling. “We do a lot of research and development work with the cold press,” said AURI Engineer Riley Gordon. “This is a great tool for that early stage as well as a little further upstream when a client needs pressing done for analysis purposes.”

The benefit of the cold press process

Product quality is typically at the top of the list when an entrepreneur chooses to use a cold press in their production. Other extraction methods, where external heat is applied, can cause nutritional degradation due to thermal stresses inherent to the process. “Research shows that pressing at temperatures above 130 degrees may cause a loss of nutrients, such as vitamins and antioxidants in the product,” said Gordon. “What’s more, when the temperature rises above that point, there can also be a negative impact on flavonoids and other compounds, affecting the overall flavor of the product.”

Another benefit of utilizing cold press process technology is the potential to add value to the primary product through coproduct development. Often, after pressing is complete, there is left-

over product called “cake” or “meal” which has its own value. For example, the resulting cake from pressing oil seeds may have additional value as livestock feed, an industrial product, a biobased fuel source, or even for human consumption, depending on its qualities.

“AURI’s Waseca facility is perfectly suited to assist entrepreneurs in this sort of endeavor and has the resources necessary for developing coproducts from the remnants of the cold press process,” said AURI Senior Scientist, Coproducts Al Doering. “There are so many opportunities in this area, so it’s definitely enticing to entrepreneurs.”

AURI’s capabilities

AURI’s coproducts team has hands-on experience with cold press projects across a wide range of oil seeds including soybeans, sunflowers, hemp, camelina, pennycress and canola. In addition, AURI can offer expertise on utilizing this process for creating products in the animal feed and human consumption sectors.

If you have a project which could benefit from cold press technology as part of your early stage development, or require special analysis, contact AURI today at auri.org.

BY AURI *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.*



Microbes Play Important Role in Producing Coffee

When it comes to processing coffee beans, longer fermentation times can result in better taste, contrary to conventional wisdom. Lactic acid bacteria play an important, positive role in this process.

During extended fermentation, leuconostocs -- a genus of lactic acid bacteria used in the fermentation of cabbage to sauerkraut and in sourdough starters -- declined in favor of lactobacilli, said Dr. De Vuyst. Lactic acid bacteria were already present before fermentation, and these acid tolerant lactobacilli proliferated even more during this process.

Researchers saw an impact of the microbial communities, in particular the lactic acid bacteria. They yielded fruity notes, and had a protective effect toward coffee quality during fermentation because of their acidification of the fermenting mass, providing a stable microbial environment and hence preventing growth of undesirable micro-organisms that often lead to off-flavors.

Furthermore, there is a build-up of the fermentation-related metabolites onto the coffee beans, which affects the quality of the green coffee beans and hence the sensory quality of the coffees brewed therefrom.

While more research is needed to determine a concrete causal relationship, due to the fact that scientist still don't know how each stage of processing can influence the taste of coffee.

Science Daily



Gypsum: common ingredient in drywall can increase yields, improve soil

Recent research shows gypsum recovered from coal-fired electricity generating power plants is good for agricultural use because of its ability to improve soil health.

Gypsum, which is high in both calcium and sulfur, has a chemical composition making those nutrients more available to plants than some other common sources of these nutrients. Gypsum changes soil pH very slightly, yet it promotes better root development of crops, especially in acid soils. Another bonus of gypsum is that it is a moderately-soluble mineral. This means the calcium can move further down into the soil than the calcium from lime (calcium carbonate). This can inhibit aluminum uptake at depth and promote deeper rooting of plants. When roots are more abundant and can grow deeper into the soil profile, they can take up more water and nutrients, even during the drier periods of a growing season.

Also, gypsum can be an excellent source of sulfur over several growing seasons. Research found that the sulfur is available not only in the year applied, but can continue to supply sulfur for one or two years after, depending on the initial application rate. Gypsum as a sulfur fertilizer has benefitted corn, soybean, canola, and alfalfa.

Gypsum can also help improve soil structure. Many of us look at soil as a uniform, static substance. In reality, soil is a mixture of inorganic particles, organic particles, and a complex mixture of pore spaces, water, and soil microbes. Its composition changes through weather events like rainstorms, by tillage, or as plants pull nutrients for growth. Farmers have to manage their soil well in order to maintain good crop yields year after year.

Science Daily

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 at walking clients through the entire development journey of bringing a new product or process from idea to reality.

Service Areas: What AURI Provides

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.
- Sign up to receive the *Ag Innovations News* or the AURI electronic newsletter to stay informed about AURI projects and clients.



Join the conversation on Facebook at [AgriculturalUtilizationResearchInstitute](https://www.facebook.com/AgriculturalUtilizationResearchInstitute)



Follow us on Twitter at @AURIcomm

Contact Us

auri.org

218-281-7600

Crookston

510 County Road 71
Suite 120
Crookston, MN 56716

Marshall

1501 State Street
Marshall, MN 56258

St. Paul

U of M Biological
Sciences Center
1445 Gortner Avenue
(physical address)
1475 Gortner Avenue
(mailing address)
St. Paul, MN 55108

Waseca

PO Box 251
Waseca, MN 56093



PHOTO BY ROLF HAGBERG

ABOUT AG INNOVATION NEWS

Erik Evans, managing editor
Rolf Hagberg, photography
Design by,



Electronic pdf copies of current and previous *Ag Innovation News* issues are available on the website: auri.org.

Address correspondence or subscription requests to:

Ag Innovation News
PO Box 251
Waseca MN 56093
507.835.8990
news@auri.org



BOARD OF DIRECTORS

Ron Obermoller, Chair

Minnesota Soybean Research & Promotion Council

Jerry Hasnedl, Vice Chair

Minnesota Farmers Union

Larry Johnson, Secretary/Treasurer

Agribusiness

Sen. Rich Draheim

Minnesota Senate

Rep. Jeanne Poppe

Minnesota House of Representatives

John Schafer

Minnesota Beef Council

Jon Veldhouse

Cargill

Carolyn Olson

Minnesota Farm Bureau

Ken Asp

Minnesota Wheat Research & Promotion Council

Federico Tripodi

At-Large Board Member



AURI Elects New Board Members

AURI recently welcomed three new members to its Board of Directors! During its January meeting, the AURI Board elected a new director from agribusiness and its first-ever at-large director. Each director will serve a three-year term on the Board, providing guidance to the Executive Director and staff. Additionally, the new Minnesota House of Representatives appointed its delegate to the AURI board.

Jon Veldhouse



Jon Veldhouse is currently a Business Development Manager responsible for identifying and realizing new opportunities for Cargill's Bioindustrial Group. Mr. Veldhouse began his career with Cargill in 1999 as a Chemist at the Blair, NE biorefinery campus, followed by several years developing lactic acid fermentation technologies for the NatureWorks joint venture in Minnetonka, MN.

In 2009, Veldhouse transferred to Cargill's Cultures and Enzymes business and led process and new product developments for dairy industry applications. He later became Senior Principal Scientist and a member of the Global Biotechnology R&D Leadership Team, focusing on microbial fermentation development, large scale manufacturing, and product commercialization.

Jon holds a B.S in Biotechnology from St. Cloud State University. Jon grew up on a family farm in western MN and now resides in Plymouth, MN with his wife (Jill) and 3 children (Kennedy, Maddy, and Henry).

Federico A. Tripodi



Federico Tripodi has served as a public company executive with extensive experience in agricultural, food and health R&D and product development. During his two-decade career in the ag tech and seed industry he has led organizations in both

Fortune 500 and entrepreneurial settings. Most recently, he was the CEO of Calyxt Inc., a food ingredient company developing based on a gene editing technology invented at the University of Minnesota.

During his tenure at Calyxt, he transformed the company from a research-based entity to a commercially focused growth corporation that delivers food ingredients, such as High Oleic Soybean Oil, directly to food companies, taking the company public via an initial public offering and successfully raising over \$120 million.

Rep. Jeanne Poppe



Representative Jeanne Poppe is the Chair of the Minnesota House Agriculture and Food Finance and Policy Division. Poppe lives in Austin, Minnesota, and represents House District 27B in southern Minnesota. She is an educator and

a counselor, with degrees in sociology and counseling. Now in her 8th term in the Minnesota House she also serves on the Greater Minnesota Jobs and Economic Development Finance Division, Higher Education Finance and Policy Division, Housing Finance and Policy Division and the Ways and Means committees.

Since 1999 Rep. Poppe has been a college counselor at Riverland Community College and served as president of the Minnesota State College Faculty Counselors Association from 2002-2004. Prior to her work as a counselor, she was the college's director of admissions from 1995-1999, and the women's center director from 1993-1995.

Watch for Q&A articles with each of AURI's new Board members in future editions for Ag Innovation News

