

Dairy Pipeline



A Technical Resource for Dairy Manufacturers

FINDING A WHEY

HOW A PARTNERSHIP BETWEEN CDR AND tera'swhey® LED TO INNOVATIONS IN THE WHEY INDUSTRY

The rags to riches story of whey is a true testament to the powerful partnership between the dairy industry and food science researchers. A byproduct of the cheesemaking process, whey was once a waste product spread on farm fields or used in animal feed, but thanks to a partnership between industry and academia, that all changed. Innovations in whey processing equipment and methods have allowed the U.S. whey market to grow to around \$1 billion dollars, but that growth would not have been possible without the tenacity of companies like Wisconsin Specialty Protein and their partnership with places like the Wisconsin Center for Dairy Research.

Launched in the late 2000s with the support of the Wisconsin Department of Agriculture, Trade and Consumer Protection, Wisconsin Specialty Protein, a subsidiary of Omega Protein, and its flagship brand, tera'swhey®, were developed to provide artisan cheesemakers with an outlet for specialty whey. Sourcing recombinant bovine somatotropin (rbST; sometimes referred to as rBGH) free, organic and goat whey, tera'swhey® began manufacturing whey protein powders at their eco-friendly plant in Reedsburg, Wisconsin.

“We focus on Wisconsin producers, first and foremost,” said Julio Del Cioppo, Director of Sales & Marketing at Wisconsin Specialty Protein. “We generally source our whey from cheesemakers that are within 200 miles of the plant in Reedsburg, which is central to many artisan cheesemakers. This is a perfect outlet for their liquid whey and provides a locally-sourced product to our consumers.” Whey is approximately 95 percent water with the remaining



five percent of the whey consisting of protein, lactose and minerals. When the whey first arrives at tera'swhey® processing facility it is pasteurized to ensure food safety. The whey is then sent through a membrane separation system to remove a portion of the lactose or milk sugar and thereby concentrate the protein portion. Additional water can be removed by evaporation or reverse osmosis to further concentrate the protein and

lactose product streams. The water is then “reused” for cleaning equipment or producing steam for heat used in processing.

While the process results in whey protein that contains a number of important amino acids as well as lactose and minerals, all of this drying and processing can use quite a bit of energy and water. With a focus on sustainability, tera'swhey® wanted to be sure that their facility was as conservative as possible in their use of resources.

“Our location in Reedsburg is all about being green,” said Del Cioppo. In fact, the plant was designed and built with Leadership in Energy and Design (LEED) standards in mind. “We use 30 percent less water and electricity than the average whey processing plant. We process organic or rBGH free, grass-fed whey and then add our flavors such as Organic Bourbon Vanilla and Fair Trade Certified™ Dark Chocolate that are responsibly sourced,” continued Del Cioppo.

Essentially, the plant was built with artisan cheesemakers in mind. The two-line system is set up to process small batches of whey efficiently, allowing tera'swhey® to provide

cheesemakers with a fair price for their specialty whey. In order to build this facility and the company, however, tera'swhey® required a lot of support from various groups and investors as well as expertise from CDR's processing experts Karen Smith, Ph.D and Mike Molitor.

"We knew the set-up needed to be very flexible," said Smith. "The goal was to bring in products other people weren't, such as goat or organic whey. In other words, products with a lot of value but not a lot of volume. Because there were smaller shipments coming in, the equipment needed to be smaller and more specialized. tera'swhey® provided that niche and we provided technical support."

Once the plant was built and the operation was up and running, tera'swhey® enjoyed success. After a few years, however, the company came under new leadership and it was time for an update to the product line. At that time, tera'swhey® began working with CDR Dairy Ingredients, Beverages and Cultured Products Coordinator, KJ Burrington and CDR Associate Researcher, Susan Larson, Ph.D. to add additional nutrient dense products to their line. KJ and her team helped with formulation but they were also there to help tera'swhey® by providing ingredient sourcing support, answering technical consumer questions and providing overall technical support.

"We didn't have our own research and development team so we met weekly with KJ and Susan for about six months to improve the taste profile and to be sure that our whey powder



tera'swhey® plant

products were all certified organic," said Del Cioppo. That partnership resulted in the development of several whey protein powder options that contain 16-30 grams of protein per serving, but tera'swhey® did not stop there. Focusing on the development of Whey Protein Concentrate 80 (WPC 80) products, the relationship between CDR and tera'swhey® continued with the launch of each new product. The most recent product being, a ready-to-drink whey protein beverage with 26 grams of protein per serving.

"The ready-to-drink beverage involved CDR in a slightly different role," said Blaine Hicks, the Manager of Research & Development at Wisconsin Specialty Protein. "I knew a bit about the flavors and what we wanted but we went back to KJ and her team for help because ready-to-drink beverages are

very technical. These drinks require UHT and aseptic fill so that the product will be shelf-stable. It's difficult and there's a reason no one else is creating these ready-to-drink beverages using whey. Still, we wanted to be on the leading edge of the curve and KJ provided that technical support."

Wisconsin Specialty Protein provided the needed equipment, while Burrington and her team worked with Hicks on any technical processing challenges.

"Originally, they had some stability issues, but we provided several tips on how to make the proteins more stable in the environment," said Burrington. "They would run experiments using the equipment and then come back to us with any questions."

Despite a few challenges during the development, tera'swhey® was able to work through the issues and launch this new product in late 2015. At this time, the product, available in Fair Trade Certified™ Dark Chocolate Cocoa and Bourbon Vanilla, is not certified organic but is non-GMO, gluten free and made whey processed from grass-fed, rbST free milk.

"KJ worked with me trying to find a solution. She has been a great resource and has been very patient," said Hicks. "At this point, KJ is in more of a consulting role. I show up once a month with product and she gives us feedback on the products. She also helps us go over shelf-life studies and evaluate separation. She's a great technical resource."

Hicks is very proud of the new line extension and feels that the ready-to-drink product will be a new, convenient way for customers to enjoy tera'swhey®.

"tera'swhey® is all about the clean label," said Hicks. "At one time protein drinks contained a lot of gums and artificial flavors, but we came along and wanted to do it cleaner and better. We know this is something consumers want."

The commitment to quality is also very much controlled by the company, as they source their own whey and operate their own packaging line. They believe that this allows them to keep a close eye on supply while preserving the quality of the product.

"Our control over our supply helps to preserve our quality and it really sets us apart," said Hicks. "We've been able to expand two-fold, add personnel and push new distribution. We've really been building momentum and CDR has been a big part of that. We've been pushing the boundaries and KJ has been helping us get there."

For more information on tera'swhey® or its distribution, please visit www.simplyteras.com

For more information on the CDR Dairy Ingredients, Beverages and Cultured Products program or to see how CDR can help with your next project please contact KJ Burrington at burrington@cdr.wisc.edu. 🍌

BUYER BEWARE: ADD SPECIFICATIONS TO YOUR BILL OF LADING

Technical Contributor: Dr. Robert L. Bradley, Professor Emeritus, Dept. of Food Science, University of Wisconsin

The United States dairy industry is dedicated to the manufacture of safe, wholesome and quality dairy products. As such, dairy plants spend a great deal of time selecting high-quality equipment and developing robust cleaning and sanitation programs that will support the safety and quality ambitions of the industry.

Unfortunately, on occasion, equipment buyers may purchase a ferrule or another piece of equipment that seems to meet high-quality standards, but ultimately falls well below 3-A Sanitary Standards or accepted practices.

For example, Dr. Robert Bradley, emeritus professor, UW-Madison FoodsScience, recently worked with an individual who was involved in a new plant construction project. During the project, the assembly of the equipment was excellent and the tubing was noted to be produced in the United States and certified by proper standards. Unfortunately, the ferrules were supplied from overseas and the supplier did not meet proper standards. So, when it came time to use the equipment the manufacturer noticed leaks and corrosion which can be seen in Figure 1. Further testing showed that the ferrules were not up to standard and in fact contained copper, which does not stand up to the constant use and cleaning procedures that are required in the industry.

Figure 1



Therefore, it is especially important to do your homework when using items from other countries, since there is no universal rule requiring suppliers to provide buyers with 3-A approved equipment or other standardized equipment. The 3-A and 304 symbols are put on stainless fittings and tubing to assure customers that the equipment meets state and federal standards. So, by footnoting your purchase order with a phrase such as, "Equipment and tubing connections must pass state and federal inspection," you are providing yourself with a protective measure. In the Guidelines for Sanitary Design and Fabrication of Dairy Processing Equipment the United States Department of Agriculture (USDA) also recommends that all equipment buyers require USDA-Dairy Grading Branch acceptance for equipment as a provision of a purchase contract.

Taking this step not only shows a commitment to quality but it also provides the base for legal remedy should such an

incident occur. It's also worth noting that the Pasteurized Milk Ordinance (PMO) states the following related to this issue:

Stem 10P Sanitary Piping	
①	All sanitary piping, fitting and connections which are exposed to milk and milk products shall consist of smooth, impervious, corrosion resistant, non-toxic, easily cleanable material, which is approved for milk products contact surfaces.
②	All sanitary piping connections and fittings consist of: a) Stainless steel of the AISI 300 series, or b) Equally corrosion resistant metal which is non-toxic and non-absorbent.
These same requirements are found in all state regulations directly from the PMO.	

For more information on these issues, please visit the sites below or contact: CDR Safety and Quality Coordinator: Marianne Smukowski, msmuk@cdr.wisc.edu or Department of Food Science and CDR, Emeritus Professor Dr. Robert Bradley, rbradley@wisc.edu

Resources:

3-A: www.3-a.org/3-A-Symbol/About-the-3-A-Symbol

European: www.ehedg.org

Equipment Guidelines (used when there is no 3-A Standard specific to the application): www.ams.usda.gov/sites/default/files/media/USDA_Guidelines_for_the_Sanitary_Design_and_Fabrication_of_Dairy_Processing_Equipment-June_2001.pdf
"To prepare for an equipment review":

www.ams.usda.gov/services/auditing/equipment/dairy-prep

NON-TOXIGENIC *E. COLI* NEW REGULATIONS UPDATE



In the Winter 2014 issue of the Dairy Pipeline (Volume 26, #4), technical experts discussed the science behind non-toxigenic *E. Coli* as well as the Food and Drug Administration's (FDA) proposed policy to lower the amount of allowable non-toxigenic *E. Coli* in raw milk cheeses.

As the article stated, non-toxigenic *E. Coli* is not harmful but its presence serves as an indicator for an increased probability of contamination from other pathogenic bacteria. As such, the FDA has a limit on non-toxigenic *E. Coli* of 10,000 MPN/g for cheese. Within the last few years, however, the FDA has lowered the enforcement limit on this organism. Currently, if five subsamples of cheese are tested, three of the subsamples must be <10 MPN/g and no sample can be > 100 MPN/g.

The new limits and the continued regulatory concern with an indicator organism have been points of contention within the industry. Shortly after it was announced that the FDA was reviewing these limits and policies, several industry organizations contacted the FDA to better understand the need for such stringent regulations on an organism that is not harmful to human health. Science and industry experience was shared with FDA and after further review, FDA has decided to pause the implementation of stronger limits as it reviews new safety information.



2016 WISCONSIN MASTER CHEESEMAKERS



This year, the Wisconsin Master Cheesemaker® Program will be honoring its 20th class of cheesemakers to complete the program. Established as an advanced education program for experienced cheesemakers through joint sponsorship with the Wisconsin Center for Dairy Research and the Wisconsin Milk Marketing Board, the Wisconsin Master Cheesemaker® Program will welcome seven new and three returning Masters. These Masters will be honored at the 2016 International Cheese Technology Expo (ICTE) banquet in Milwaukee, WI on April 14, 2016.

JEFF ALLEN, BELGIOIOSO CHEESE INC.

Certified Master: Gorgonzola & Blue

After nearly 28 years in the cheesemaking business, Jeff Allen still thinks back to the day that he started his very first job in a cheese plant.

“At 14 years old, I came home from school and my mom informed me that she had found me a job doing repack,” said Allen.

At the time, Allen thought it would amount to nothing more than a summer job, but he grew to like the job and he found a passion for the industry. After gaining some experience in sanitation, equipment, and other areas of the cheese industry Allen went on to work at BelGioioso, where he currently makes cheese and serves as the plant manager.



“I came to BelGioioso with experience in sanitation but it wasn’t until my mentor took me under his wing that I began to really grow into the cheesemaker I am now,” said Allen.

Allen’s mentor, Mauro Rozzi, an Italian Cheesemaker who brought his cheesemaking expertise from Italy to Wisconsin to begin provolone making at BelGioioso in 1979, has mentored all the BelGioioso Cheesemakers in the art of traditional provolone cheesemaking.

“Mauro trained me in everything,” said Allen. “He taught me everything from sanitation to cheesemaking. I am lucky to have such a plethora of knowledge at my fingertips.”

With the help of Rozzi, and the entire team at BelGioioso, Allen grew, learning to make everything from provolone and fresh mozzarella to parmesan. This year, however, Allen will complete the Wisconsin Master Cheesemaker® Program, earning certificates in gorgonzola and blue cheese.

“I love the challenges presented by gorgonzola and blue cheese. It’s kind of that go big or go home mentality with those cheeses. I also like the entire process of cheesemaking and having to adapt to all the moving parts, the variables and all of the daily challenges.”

Allen is excited to earn his first Wisconsin Master Cheesemaker certification but he is not planning to stop there. He plans to continue pursuing the program by branching out and trying to master other cheeses.

“The Master program offers so much support and knowledge,” said Allen. “They really help you to troubleshoot and grow your product. I will keep pursuing other cheeses and see where this takes me.”

BILL HANSON, ARENA CHEESE, INC.

Certified Master: Colby and Gouda

At 18 years old, Bill Hanson knew he needed to find a job. Unsure of where to turn, he decided to apply to a Swiss cheese plant in Monroe, Wisconsin. He would have never guessed it at the time, but he soon discovered that cheesemaking was his true calling.

“At the time, Swiss cheesemaking was a lot of work,” said Hanson. “We used copper kettles and it required a lot of physical labor but the hard work always resulted in a good end product and that was a good lesson. The comradery of the cheesemaking industry also struck me.”



Hanson found that he fit in with the cheesemaking community and he began exploring all of its facets. Long before whey protein became popular, Hanson was experimenting with processing. So when a local cheese plant needed someone to work with whey, Hanson jumped at the chance to learn, teaching himself the ins and outs of membrane processing.

After many years of experimentation and several mergers, Hanson decided he wanted to return to his roots. Along with a few business partners, Hanson purchased an abandoned factory, named his company Arena Cheese and began making Colby and Colby-Jack longhorn.

“I started making cheese at the plant in 1999 and we had one customer,” said Hanson. “Today, we make about 28,000 pounds of Colby, Colby-Jack and Gouda each day.”

Hanson wanted to keep the tradition of Colby alive in his ➔

plant while also continuing his education so, after nearly 40 years in the industry, Hanson enrolled in the Wisconsin Master Cheesemaker® Program.

“I had always been aware of the Master program,” said Hanson. “It’s so well-known in the industry and the customers really appreciate the Master’s Mark. There’s also some personal pride in being a part of the Master cheesemakers.”

Hanson enjoyed the comradery of the program but he also really liked the education.

“All of those classes at CDR are great,” said Hanson. “I loved learning about the industry, where things are going and it was especially fun to see where membranes are today. The test at the end of the program was also fun but intense. It seems like you know the answers to the questions but you learn so much going out and doing the research to find out the why behind the answer.”

Hanson is perhaps most excited to pass on what he’s learned to future cheesemakers. Through the Master program he’s had the opportunity to expand his network, meeting some old friends and making some new ones, so he looks forward to sharing knowledge and continuing to contribute to the cheese industry community.

“I guess at the end of the day,” said Hanson. “I was born and raised around cheese in Green County and I’ve just been lucky to make a career out of it.”

BOB KOENIG, CARR VALLEY CHEESE CO. Certified Master: Fontina & Gouda

Many of Bob Koenig’s favorite childhood memories involve cheese. In fact, Koenig grew up about a mile from the La Valle Carr Valley cheese plant. His Grandma worked in the front office so Koenig stopped by frequently to see her and sample a few fresh curds right from the vat.

“I can remember the smell of the fresh curds,” said Koenig. “I was only about three or four when I began visiting and the sights and the smells of the plant really stuck with me.”

Koenig was hooked so it wasn’t long before he began working at Carr Valley. Koenig called himself the “tour guide,” spending time with customers and helping them find products. When he was old enough, Koenig began working in the cheese plant as a waxer, eventually taking on other roles and continuing his work there throughout high school and college.

After completing his degree in business management at the University of Wisconsin-Platteville, Koenig went back to Carr Valley and began making cheese. There Koenig also became involved with quality assurance as well as helping



out at cheese shows. He currently spends a great deal of his time working on continuous improvement plans and training programs for employees.

“It’s all about continuous improvement,” said Koenig. “And that includes continuous improvement for myself. Entering the Wisconsin Master Cheesemaker® Program was the next logical step in that process and it’s one more step towards becoming a better cheesemaker.”

This year Koenig will earn certifications in Fontina and Gouda. This will also mark his first time through the Master program, but he is not alone. Carr Valley cheesemaker Tom Jenny and Carr Valley owner Sid Cook are already Masters. In fact, Koenig credits them with his decision to join the program.

“Sid really pushed me to get my original cheesemaker license and to invest in things that would help me to be better,” said Koenig. “When I had my ten years in as a cheesemaker and the time came when I could apply for the Master program I knew it was the right thing to do. My mother and father also had an impact on my decision. They always influenced me to do what’s right. They weren’t cheesemakers but they wanted me to follow my dreams. I would also like to credit my wife Kelly as a positive influence in my life.”

Koenig took Sid’s advice seriously, pursuing cheesemaking after he discovered that other industries just didn’t have the same family atmosphere he felt while working in the cheese industry.

“You know, I spent time in the engineering industry and I tried other things out but I really love the fact that you’re a part of a family in the cheese industry,” said Koenig. “It’s competitive but it’s still relaxed and everyone likes to talk cheese. It’s all about being a resource for each other and moving the industry forward together.”

DARRELL MANNING, BELGIOIOSO CHEESE INC. Certified Master: Provolone

Darrell Manning wasn’t born in Wisconsin, but cheesemaking is still in his blood. Growing up in the midwest Manning worked on farms milking cows and helping out with beef cattle. As a young adult he tried his hand at various jobs including work in the canning business, but nothing seemed like a good fit until he applied to work at a cheese plant in Lena, Wisconsin.

When Manning arrived in Lena, he began making ricotta and mozzarella cheese. He enjoyed the industry and tackling the challenges presented during cheese making. In the end, he spent 16 years at that plant.



Manning eventually went on to manufacture Swiss cheese ➔

and blue cheese before tackling the packaging and quality side of the cheese industry. He also became extremely interested in cheese defects and he spent hours studying the cheeses and experimenting in the plant in order to discover the cause of defects and prevent them in the future. Manning became well-known for his skills and eventually companies began seeking out his help. Nearly seven years ago, he joined BelGioioso, where he now makes cheese and serves as a plant manager.

“I’ve really enjoyed working at BelGioioso,” said Manning. “I’ve had many roles here but it’s been great learning from my mentors including Mauro Rozzi, Gianni Toffolon and Bill Kocha. They are all very knowledgeable, and have challenged me to do my best.”

After nearly 32 years in the cheese industry, this year Manning will be honored with his first Wisconsin Master Cheesemaker® program certification in provolone, a cheese he learned to make under the direction of his mentors.

“Provolone was one of the first cheeses BelGioioso ever made, so I wanted to honor that tradition,” said Manning. “I also thought provolone would be a demanding cheese to make and a good challenge for me. There’s nothing I love more than a challenge. It also gave me the opportunity to focus my efforts and just devote myself to learning more about that cheese.”

Though Manning is passionate about provolone he is also interested in continuing with the Master’s program potentially adding fresh mozzarella or other Italian cheeses.

“Coming to the UW-Madison campus to work with other cheesemakers and professors was a great experience,” said Manning when speaking of the Master program. “It helped me to gain more knowledge and connect with outside people. I really enjoyed the opportunity and it will help me as I continue to experiment and develop new cheeses.”

JON METZIG, WILLOW CREEK CHEESE/UNION STAR Certified Master: Cheddar & Colby

Jon Metzиг has always had a passion for the dairy industry. The son of a third generation cheesemaker, Metzиг grew up working with his dad at Union Star, the family’s cheese factory in Berlin, Wisconsin. During college, Metzиг followed his passion, studying agriculture business and food science, while spending a great deal of his time in the UW-River Falls pilot plant.

“The microbiology drew me to the products,” said Metzиг. “It was amazing to see all that you can make out of milk.”

Metzиг debated several career choices related to the industry, but in the end, he decided to follow in his family’s footsteps,



becoming a fourth generation cheesemaker. Metzиг spent the first few years out of college working at Crave Brother’s Farmstead Cheese in Waterloo, Wisconsin. In 2009, Metzиг returned to his father’s plant to pursue the family business, which included joining the ranks of Wisconsin Master Cheesemakers.

“I first heard about the Wisconsin Master Cheesemaker® Program when I received my cheesemakers license,” said Metzиг. “Once I decided to go into cheesemaking I knew the program was something I wanted to do.”

Metzиг’s father, David Metzиг, received his Master certification in Cheddar in 2001. This year Metzиг will join his father, receiving his certifications in Cheddar and Colby. Metzиг credits his father with many of his successes.

“My dad taught me that you need to focus on quality and everything will follow after that,” said Metzиг. “He taught me to work hard every day and to always try to improve.”

As such, Metzиг has been focusing his efforts on aged Cheddar cheese. Over the next five to ten years, Metzиг hopes to grow his artisan cheeses in this area, which has traditionally been seen as a commodity market.

“The Master artisan courses at the Wisconsin Center for Dairy Research have been really helpful,” said Metzиг. “Marianne Smukowski at the Center for Dairy Research has been a particularly great help with cheesemaking and everything else. I’ve also really enjoyed the process and I’ve learned so much about quality, consistency and grading.”

Metzиг hopes to return to the Wisconsin Master Cheesemaker® Program soon to continue his education and gain certifications in additional cheeses.

SCOTT NAVARRE, FOREMOST FARMS USA Certified Master: Cheddar & Monterey Jack

Some of Scott Navarre’s favorite childhood memories include those days when he and his family would drop off lunch for his dad at the local cheese plant. A third generation cheesemaker, Navarre still thinks back to those lunches and getting a chance to enjoy the cheese that was made fresh that day.

Navarre followed in his father’s footsteps spending a lot of time working in the food industry and eventually joining his father at the local plant. There, Navarre learned to make American-style cheeses including Cheddar and Monterey Jack.

“I learned that there is a blend of science and craftsmanship involved in the process of making cheese,” said Navarre, who has been making this style of cheese for nearly 15 years. ➔



Approximately 10 years ago Navarre joined Foremost Farms USA where he currently works as the Safety Coordinator and Production Supervisor at the Marshfield, Wisconsin plant. When Navarre joined Foremost Farms he knew that he wanted to be part of a plant that specializes in the American-style cheeses he loves so much.

That's why this year, Navarre is honored to earn his first certifications as a part of the Wisconsin Master Cheesemaker® Program. He will become certified in Cheddar and Monterey Jack, but he may not stop there.

"I would love to do the Master program again," said Navarre. "I would like to work towards a certification in Colby. It's one of my favorite cheeses and having grown up in Colby, it would mean a lot to me."

Navarre was inspired to join the program thanks to support from his colleague and fellow Master cheesemaker, Brian Jackson, who also returned to the program this year. Navarre enjoyed the opportunity to meet people working in all facets of the industry. He also enjoyed the education aspect of the program and all that the CDR courses had to offer.

"The education portion of the Master cheesemaker program that takes place at CDR was something I really looked forward to," said Navarre. "Every time I took a course I learned something different about the industry."

In the end, Navarre is happy to follow in his family's footsteps and he's particularly proud to join the ranks of the Wisconsin Master Cheesemakers.

DALE SCHMIDT, LAND O' LAKES, INC. Cheddar & Monterey Jack

Dale Schmidt has always loved the science of cheesemaking. Growing up on a dairy farm, Schmidt was exposed to the dairy industry at an early age and that experience fueled his passion for the science side of dairy. Schmidt always knew that he wanted to mix his passion for the dairy industry with his passion for science so in the late 1970s Schmidt attended the University of Wisconsin-Madison where he received a degree in food science.

During that time, Schmidt sought out an internship at Lake to Lake Dairy Cooperative in Kiel, Wisconsin, (now Land O' Lakes) where he gained hands on experience in the art of cheesemaking at an award winning cheese plant.

After graduation, he returned to Kiel as the Quality Assurance Supervisor in charge of the laboratory, intake operations and sanitation crew. Over the next decade he transitioned from quality to production, eventually overseeing the starter making and cheesemaking operations. During the late 1980s he oversaw the transition of the Kiel starter program from a traditional



bulk starter with a rotation of 25 mixed strains of culture, to an external pH controlled starter with defined strains. He also was part of the team that replaced open cheese vats with automated enclosed cheese vats and updated the automated cheddaring equipment. Throughout these changes, there was always a focus on maintaining or improving quality and continuing to make award winning cheese.

After leaving Land O' Lakes in 1993, he spent nine years working in the cheese equipment business. This broadened his experience to include other varieties of cheese and allowed him to observe cheesemaking operations throughout the United States and in other parts of the world.

Schmidt was involved in the development of a semi-automated process for making Stilton style cheese. "I think that's when I learned that sometimes people will say you can't do some things but then the art part of the process comes in and you find out that maybe those things are possible. We learned how important it is to invest in new technologies, but also how important it is to honor the tradition of the craft and make a good cheese."

He eventually made his way back to Land O' Lakes where he now serves as the Operations Manager in Kiel, Wisconsin.

While Schmidt has been a part of the dairy industry for most of his life, and has had a Wisconsin cheesemakers license since 1982, his previous roles in the equipment industry didn't allow him to pursue the Wisconsin Master Cheesemaker® Program, which requires a cheesemaker to be actively working in a Wisconsin cheese factory. Schmidt's current role at Land O' Lakes provided the perfect opportunity to become involved, so this year, Schmidt will receive his first Master certifications in Cheddar and Monterey Jack.

"The Master Program has allowed me to learn some new things, made me reconsider some things I thought I knew and allowed me to connect with members of the industry," said Schmidt.

Schmidt is also excited to become involved with the program because it is something his customers are passionate about and he is honored to provide that service to the public. Schmidt is also looking forward to honoring his mentor, Robert Kramer, who was the plant manager at Land O' Lakes when Schmidt first began working there in the late 1970s.

"Bob was very supportive and open with his staff, and allowed you to explore new ways of doing things," said Schmidt. "He was so knowledgeable and he shared that but he also wanted you to experiment."

That curiosity and desire to experiment has certainly stayed with Schmidt. Today, he continues to experiment with cultures and ingredients in order to develop the very best cheese possible. Working with his team at Land O' Lakes, Schmidt continues to promote that link between the art and the science, encouraging innovation and creativity through experimentation. ➔

"It's great to work with a company that takes high quality cheese very seriously," said Schmidt. "Honestly, I think I'm very lucky."

RETURNING MASTERS

BRIAN JACKSON, NASONVILLE DAIRY

Certified Master: Muenster & Gouda

Never one to back down from a challenge, Wisconsin Master Cheesemaker Brian Jackson will earn his fifth and sixth Wisconsin Master Cheesemaker certifications this year. Previously honored with certificates in brick, Colby, Monterey Jack and Cheddar, Jackson will add Muenster and Gouda to his long list of accomplishments.

After 38 years in the industry, Jackson is proud of the decisions he has made and the tenacity he's shown when things get tough. For him, success has always been about hard work and determination.

"I originally just happened into cheesemaking, because my Dad said I needed a job if I wanted to buy a car," said Jackson. "My personal goals became my driver though and got me to where I am."

Jackson started his career working with American-style cheeses, but he eventually branched out to other styles as well. While things have changed over the years, Jackson still has a passion for the process.



"There are some fun aspects of cheesemaking," said Jackson.

"But, there's something good about the manual way, the old way of doing things. I remember working six days a week, 12 hours a day but it was fun."

Jackson also enjoys the challenges and fun provided by the Wisconsin Master Cheesemaker® Program, which is what keeps him coming back for more certifications.

"It was a personal goal to get certified," said Jackson. "But the people at CDR and the other cheesemakers made it worthwhile. We always have a good time together and that's made it something I want to stick with."

TOM JENNY, CARR VALLEY CHEESE CO.

Certified Master: Mixed Milk Cheeses

Tom Jenny spent most of his childhood in a cheese plant. While working for his father and uncle making Swiss cheese, Jenny had a hand in every aspect of the process. From washing floors and vats to making the cheese, Jenny was a born cheesemaker.

Things changed, however, when Jenny received his draft notice for the Vietnam War in 1969. Soon he found himself serving in the U.S.

Navy and far from any cheese plant. Jenny spent four years in the Navy returning home a few times, including once in 1969 when he became engaged to his high school sweetheart and again in 1971 when they got married. Soon after they were married Jenny whisked his new wife away to Pearl Harbor where the family was based until Jenny's deployment ended in 1973.



After completing his service Jenny returned to his true calling, working as a cheesemaker in his father's cheese plant until 1994 when Jenny decided to attend college part-time in order to get a background in business. While attending college, Jenny was contacted by Jim Path at the Wisconsin Center for Dairy Research regarding a new idea called the Wisconsin Master Cheesemaker® program. The program offered Wisconsin cheesemakers the opportunity to continue their education while earning a Master certification in up to two cheeses. Jenny jumped at the chance and in 1997, he joined the very first class of Wisconsin Master Cheesemakers earning a certification in Swiss.

After receiving his bachelor's degree in business management in 1999 Jenny decided to branch out, leaving his father's Swiss plant and joining a number of other cheese plants in the state making a wide variety of cheeses.

Jenny was looking for a new adventure in 2004 when Sid Cook, the owner of Carr Valley Cheese, contacted Jenny and asked if he would like to work at Carr Valley.

"I was excited to work with Sid on his originals," said Jenny. "I love taking milk and turning it into a new food, but I particularly love working with Sid on blue style cheeses, aged Gouda and our Gran Canaria."

Cook's original ideas continued to fuel Jenny's passion and in 2012, Jenny returned to the Master program to receive additional certifications in Fontina and Gouda. This year, Jenny will add mixed milk cheeses to his list of certifications.

"There's a lot of satisfaction in knowing that I'm helping the company and contributing to something," said Jenny. "I love the fact that I was able to be a part of that first class and I've continued with the program because there's just something about it. It helps me to stay updated on techniques but it also offers comradery."

Jenny, who has helped Carr Valley to win more than 400 top awards, has been in the cheese industry for most of his life, but he says this will be his last Master certificate. ➔

Still, after more than 43 years making cheese and many unique adventures outside of the cheese industry, Jenny doesn't think he will ever be able to leave the cheese plant behind.

"I suppose I'll retire eventually," said Jenny. "But, I don't think I'll ever be fully disconnected from the cheese industry. I guess my future still remains to be seen."

GERARD KNAUS, WEYAUWEGA STAR DAIRY INC.
Certified Master: Brick & Colby

For third generation cheesemaker Gerard Knaus, making cheese has been a lifelong passion. Born into the industry, Knaus grew up watching his father and grandfather make cheese. By the time Knaus was in high school, he was involved in the process too, helping his father to make cheese at Weyauwega Star Dairy, the family's cheese plant which Knaus still operates today.

"I have been surrounded by people who love cheese my whole life," said Knaus. "Our company produces over 50 different types of cheese and the best part about making cheese is walking into our cheese store and seeing all of our products on display. I also enjoy talking to the customers about the Master Cheesemaker Program."



Knaus, who has Master certifications in feta and parmesan, will receive additional certifications in brick and Colby this spring through the Wisconsin Master Cheesemaker® Program. Established as an advanced education program for experienced cheesemakers through joint sponsorship with the Wisconsin Center for Dairy Research and the Wisconsin Milk Marketing Board, the Wisconsin Master Cheesemaker® Program provides Wisconsin cheesemakers with 10 or more years of experience the opportunity to take a formal sequence of courses that leads to the title of Wisconsin Master Cheesemaker.

"The first time I heard about the program was during a short course I took at the Center for Dairy Research," said Knaus. "I felt the program would be very beneficial to myself and our company. Getting certified for Colby and brick was just another accomplishment that I knew would make me proud to call myself a Master Cheesemaker."

As the Production Supervisor at Weyauwega Star Dairy, Knaus hopes to continue with the Wisconsin Master Cheesemaker® Program earning certifications in provolone and Cheddar. Earning more certifications will require an additional three years of work, but Knaus says, "Seeing everyone love a product I produce is all the motivation I need." 🍌

CDR NEWS

A Fond Farewell

After more than 40 years in the dairy industry, CDR Research Cheesemaker Ray Michels is retiring. Described by his co-workers as dedicated, patient, thoughtful, and generous, with an exceptional work ethic, Ray will remain a treasured member of the CDR family, whose daily presence will be missed by co-workers and industry partners.

Ray began his career in 1972, working part-time at Zander's Creamery, a butter manufacturer in Cross Plains, Wisconsin. After graduating from high school, he worked full-time at Zander's until joining the Babcock Hall Dairy Plant in 1977. Ray worked as a Dairy Plant Lead Worker for about 25 years, then as the Assistant Plant Manager for 7 years before joining CDR as a Research Cheesemaker in 2009.

"I really enjoyed working with different clients that came in to perfect their products or try to develop new ones," Ray said of his time at CDR. "I enjoyed the people in the classes that came down and did hands-on cheesemaking as their excitement always grew as the day went on. But, most of all I'd have to say that the CDR family always made me feel very important. I was blessed to be able to work with such great people!"



Please join us in thanking Ray for his outstanding service and congratulating him on a well-deserved retirement! 🍌

Please Join CDR in Welcoming Jeff VanSickle

As the IT Systems Administrator, Jeff maintains the computer systems used by staff at the Center for Dairy Research. Having spent the past six years working in information technology, Jeff comes to CDR with an associate degree in Computer Networking as well as a Bachelor's and Master's degree in German Studies. Jeff's additional education and interest in many areas of math, science and culture allow him to bring a unique set of skills and passions to CDR.

While his interests are diverse, Jeff remains passionate about information technology, using his background in computer programming and his passion for security and automation to develop new IT solutions for the Center. Jeff really enjoys working with the small, tight-knit staff at CDR and he loves the diversity that IT offers. ➡



Please Join CDR in Welcoming Steve Rydzewski

As a processing research specialist, Steve is responsible for assisting the CDR Processing group with trials, SOPs, dairy plant equipment decisions and other aspects involving the processing pilot plant. Steve comes to CDR with a Bachelor's degree in Biology from UW-Oshkosh. Coupled with more than 21 years of experience working in some of Wisconsin's most advanced dairy plants, Steve is well versed in the technical aspects of the industry.

Despite his many years of experience, Steve feels that there is always more that can be learned about cheese and whey, which is why he is passionate about his role at CDR. Working with the CDR staff and industry contacts has allowed Steve to continue to learn on a daily basis, which is what he loves most about his job. He feels that he could spend a lifetime studying cheese and still not learn everything there is to know. None-the-less, he has dedicated himself to learning all that he can and helping build the dairy industry. 🍌



WCMA DONATES TO HELP CDR LAUNCH THE CERTIFICATE IN DAIRY PROCESS

The Wisconsin Cheese Makers Association Board of Directors presented a check for \$60,000 on December 9, 2015 to the William Wendorff Fund managed by the Center for Dairy Research (CDR) at the University of Wisconsin. This gift from WCMA is currently funding the creation of a new Certificate in Dairy Processing education program that CDR will initiate in 2016. For more on this program visit www.cdr.wisc.edu/shortcourses/certificate_dp 🍌



CLEAN-LABEL MONOGRAPH PUBLISHED

Contributed by Kristen Broege, CDR Intern

Recently, the U.S. Dairy Export Council (USDEC) and the National Dairy Council (NDC) partnered with CDR Dairy Ingredients, Beverages and Cultured Products Coordinator K.J. Burrington to develop a clean label monograph.

A popular trend in the U.S. food and drink markets, clean labeling generally refers to the use of simple, natural ingredients, although there is no clear legal definition for clean labeling. In her report titled, Dairy Solutions for Clean-Label Applications, Burrington explains that dairy products are some of the most versatile clean label ingredients on the market. In fact, the base for all dairy products, milk, is considered one of the cleanest, simplest foods sold to consumers today.

The benefit of consuming dairy does not end with its clean, simple appeal. Nutritionally, dairy is one of the leaders in the food industry. Dairy foods provide energy with a lower glycemic index, vitamins, minerals, and high protein quality. Dairy is also complementary to many products because it has many properties that contribute to overall functionality.

For example, the functionality of fat found in butter and other such products have been shown to be extremely beneficial to the functionality of baked goods. Whey permeate can also attribute to a baked good's crust color and flavors. Additionally, it has the ability to lower sodium content. In Burrington's report uses of dairy ingredients for clean label are described not only for baked goods but also dairy products, beverages, desserts, soups and more.

As Burrington states in the technical report, with the new consumer trend in clean-label on the rise, "food scientists can turn to dairy for a diverse group of highly functional, flavorful and nutritious ingredients."

For more, read Burrington's USDEC Clean-Label Monograph by downloading it from ThinkUSAdairy.org under the Using Dairy, Resources & Insights tab. 🍌



JOIN IN CELEBRATING CDR'S 30TH ANNIVERSARY AT THE 2016 INTERNATIONAL CHEESE TECHNOLOGY EXPO (ICTE)

Submitted by Debra Wendorf Boyke, CDR

In celebration of 30 years, CDR staff have developed three great sessions for attendees at this year's International Cheese Technology Expo, April 13 – 14, 2016, at the Wisconsin Center, Milwaukee, WI. This Expo is the world's largest gathering devoted solely to the multi-billion dollar market for cheese and related dairy products, and this is your chance to network with CDR staff as well as cheese manufacturers and suppliers from across the nation and around the world.

Wednesday, April 13

CDR Cheese Session "A Converter's Dream: Cheese Quality for the End User", 9:00 – 12:00

Hear firsthand the challenges converters face and the technical options that may be your solutions for ensuring a consistent quality product even in large scale production.

Converter's Conundrum – From Flavor to Machinability; Today's Inconsistent Quality Issues

David Wentz, Supply Quality Mgr.-Dairy, Sargento Foods Inc.

Impact of Milk Fortification on Cheese Manufacturing

John Jaeggi, Coordinator, Cheese Industry and Applications Program, CDR

Big Isn't Always Easy – Issues When Manufacturing 640s (knit, spots, moisture inconsistency)

Dean Sommer, Cheese and Food Technologist, CDR

Mozzarella and Provolone Functionality – What do You Want it to Look Like?

Pat Polowsky, Sensory Coordinator and Dr. Dana Wolle, Assistant Coordinator, Cheese Industry and Applications, CDR

Thursday, April 14

CDR Whey Session "Whey from Vat to Bag: Quality and Marketing", 9:30 – 12:00

Are you involved in whey production or utilization? Are you thinking about it? Then grab a seat and learn all you need to know about whey quality issues and regulations, co-product utilization, costs and efficiencies for multiple products, as well as global market trends and tomorrow's future dairy ingredients.



KJ Burrington, Béné Coudé, John Jaeggi, CDR

Whey Handling - Best Practices 101

Dr. Karen Smith, Dairy Processing Technologist, CDR

Co-Product Utilization – What are Your Options?

Dr. Susan Larson, Associate Researcher, CDR

Using Dairy Ingredients for a Clean Label

KJ Burrington, Dairy Ingredient, Beverage and Cultured Products Coord., CDR

Global Market Trends for Dairy Ingredients

Vikki Nicholson, Senior Vice President, Global Marketing, U.S. Dairy Export Council

Future Foods — What are Dairy's Next Ingredients

Don Otter, Certificate in Dairy Processing Program Coord, CDR

Artisan Cheesemakers Master Workshop

This unprecedented two-day workshop within the Cheese Expo is reserved for the world's artisan cheesemakers.

Day 1 – April 13, Technical Seminar, 9:00 – 12:00

Rennet Options and Impacts for Artisanal Cheeses

Bénédicte Coudé, Associate Researcher, CDR and Marianna Marques de Almeida, Senior Animal Scientist and Cheese Specialist, Ms. J and Co.

Spanish & Portuguese Cheeses: The Art and Science Behind these Regional Classics

Marianna Marques de Almeida, Senior Animal Scientist and Cheese Specialist, Ms. J and Co.

Techniques and Tools for Smear-Ripened & Washed-Rind Cheeses

John Jaeggi, Cheese Industry & Applications Coordinator and Bénédicte Coudé, Associate Researcher, CDR

The Art and Science of Cheese Affinage

Thomas Milhoua, Technical Engineer, Air Quality Process, Artix, France

Day 2 – April 14, Artisan Cheesemaking at the Vat, Clock Shadow Creamery, 8:00 – 1:30

Participate in producing a vat of Portuguese-style hard cheese made with 100% sheep's milk and thistle rennet. Vat-side discussion of cheesemaking with a host of expert cheesemakers.

CDR Booth #1019 Trade show floor

Wed., April 13, 11:30 – 5:00 | Thur., April 14, 11:30 – 4:00

Plan to join us in Milwaukee! For more information or to register please visit www.cheeseexpo.org 🍷



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Short Course Calendar:

- 📍 World of Cheese, April 25–29
- 📍 Cleaning and Sanitation, May 3
- 📍 HACCP, May 4
- 📍 Applied Dairy Chemistry, May 10–11
- 📍 Cheese Grading, June 7–9

For detailed information on each CDR short course:
www.cdr.wisc.edu/shortcourses

Events:



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