



## CDR Sensory Introduces FIZZ

The CDR sensory coordinators recently introduced the highly anticipated data collection and analysis software, FIZZ. Developed by Biosystèmes, this software allows sensory staff to design, conduct and analyze all sensory panels and tests easily and efficiently.

“This program will be a time saver for both sensory staff and clients,” said Sensory Coordinator, Luis Jimenez-Maroto. “Our biggest bottleneck was taking the time to enter all of the data from the sensory panelists. With FIZZ, we will now be able to decrease our turnaround time to 72 hours from the time of the test.”

The software has been installed on eight tablets with Windows operating systems which panelists will now use in lieu of the traditional pencil and paper. FIZZ is capable of performing a wide variety of sensory tests, including discrimination, quality control screenings and consumer preference tests. The software also includes a statistic and graphing package which can be programmed to analyze data as soon as panelists enter their information into the tablet.

“Given that we are able to customize each session, we now have the opportunity for better response control,” said Jimenez-Maroto. “That control means that we can prevent panelists from skipping questions allowing for better and more accurate data.”

In addition to response control, the program will also automatically generate data, which means better error control and almost immediate results. Upgrading to a software based system will also allow sensory staff to build a database of panelists. This database will allow sensory staff to prescreen panelists as needed for target market sensory research. For example, if sensory is looking to test the customer acceptability of a new whey protein shake, they would be most interested in finding panelists who are regular consumers of that type of beverage. This database will now allow sensory to pinpoint those panelists who fit into that category.

The FIZZ software will be available for individual company sensory sessions by September, 2012. If you are interested in a sensory evaluation of your product, please contact Luis at 608-262-3990 or limaroto@cdr.wisc.edu.

- 1 **Design Questionnaire**
- 2 **Conduct Evaluation**
- 3 **Statistical Analysis**



# Curd Clinic: Rennet/Coagulants

## Curd Clinic Resources and References:

**CDR Staff:** Dr. John Lucey, Dean Sommer, Dr. Mark Johnson

**CHR Hansen Staff:** Roy Riley, Marketing Director Food Cultures and Enzymes and John Lyne M.Sc, Director of Dairy Technology

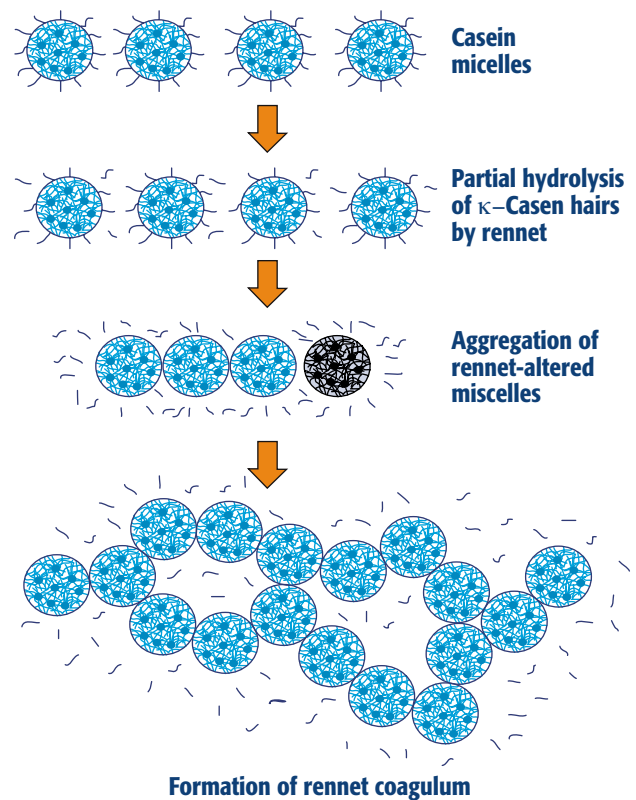
While the addition of coagulants is a basic part of the cheesemaking process, the science behind coagulants can be complex. CDR fields questions regarding coagulants on a regular basis, ranging from inquires about which product to use to whether a coagulant is vegetarian, Halal or Kosher. This article is meant to be a reference for the cheesemaker as he/she asks or fields similar questions.

## An introduction to Rennet (coagulants):

Rennet has several key functions in the cheese making process which include coagulating the milk, expelling moisture and contributing to the flavor and body development during ripening. Coagulants are essential to the proper functionality and flavor of cheese, so choosing the appropriate rennet and amount is key to producing a flavorful and consistent product. To clarify, rennet is a term generally associated with calf or camel stomach extracted enzymes while coagulant refers to all enzymes that coagulate the milk including those of microbial and vegetable origin. It is also important to remember that humans did not invent the initial concept of rennet or cheesemaking. We instead borrowed this methodology from the natural processes that take place in the stomachs of calves, camels and other mammals.

## How Coagulants Work:

The most widely used coagulant on the market today contains an enzyme known as chymosin. This enzyme is naturally found in the stomach of unweaned bovine calves where it works to curdle the milk they ingest from their mother, leading to improved absorption of the nutrients in their intestines. Chymosin contains a proteolytic enzyme that cleaves pieces of *k*-casein that protrude into the serum of milk. *k*-casein is one of four types of casein and is found at or near the boundary of the casein micelle. The portion of *k*-casein that protrudes into the serum is called the “hair-like” projection. This projection is negatively charged and thus prevents micelles from linking together since “like” charged molecules repel each other. The “hair-like” projection also prevents the micelles from interacting because they cannot get close enough, this is called steric hindrance. *Figure 1* illustrates this reaction.



**Figure 1**  
**Schematic drawing of the various processes occurring during rennet coagulation**

Note that this reaction is key in the cheesemaking process as the formation of the bonds at the time of cutting are directly related to the yield, moisture content, fat/protein recoveries and quality and texture of the finished cheese.

## Common Coagulants:

While calf rennet, which is extracted directly from the calf’s stomach, is still an ingredient used today; several varieties of rennet now exist which do not require the chymosin to be directly extracted from the calf stomach. In the case of Fermentation Produced Chymosin (FPC), the calf’s gene for production of chymosin is isolated and then inserted into food grade organisms which then produce pure chymosin during a fermentation process. The enzyme is then purified and sold as a coagulant which performs the same gelling effect as does calf extracted rennet. In addition to calf rennet and FPC, microbial and plant based coagulants also exist. The most common varieties of rennet are described in detail below.

## Calf Rennet:

Calf is one of the most traditional coagulants on the market having been used by cheesemakers as the main source of rennet up through the 1980s. Calf rennet is directly extracted from an unweaned calf’s stomach which contains essentially

two milk clotting enzymes, chymosin (80-90%) and bovine pepsin (10-20%). This variety of rennet produces a classic flavor in cheese and is an all-natural ingredient. World-wide approximately 22% of the market place continues to use calf rennet as their main milk coagulant source. In regions where DOC specifications require traditional methods of production, calf rennet is a legal requirement and therefore used heavily in the production of those artisanal cheese varieties.

Overall, the sourcing and price of calf rennet has been the area of most concern for those looking to use this source of coagulant as an ingredient. Calf stomach availability, a raw material for the extraction of chymosin, is dependent on the veal market and so the availability and price of calf rennet is very unpredictable. In addition to a volatile market, concerns over hoof and mouth disease and other diseases also deter some from using this coagulant. Traditional calf rennet can be organic if the calf was fed an organic diet, but is not accepted by vegetarians and is generally not considered Kosher or Halal unless it is extracted from a Kosher slaughtered calf.

### **Fermentation Produced Chymosin (FPC):**

FPC coagulants have become the most widely used rennet on the market since their development in the 1980s. More than 46% of the world market uses FPCs. In the U.S. more than 85% of cheese is manufactured using FPC with nearly 95% of American styles using FPC and about 75-80% of Pasta Filata cheeses using FPC.

This style of coagulant is produced through fermentation of genetically modified bacteria, fungi or yeast. This process is similar to that which is used to produce many products including insulin and some pharmaceuticals. Generally, the chymosin producing gene in calves is inserted into a microorganism. The microorganism then produces the chymosin enzyme which is extracted from the cells, purified and standardized. The mold or yeast used to produce the chymosin is destroyed after the fermentation process and no viable cells are present in the finished chymosin. The final FPC enzyme used in cheesemaking is genetically identical to calf rennet and is approved by the FDA. To clarify, a GMO microorganism is used to produce chymosin in FPC but the end product is not a GMO and legally does not need to be labeled as such.

FPC contains 100% pure chymosin. The flavor and body as well as the coagulation consistency produced when using FPC as a coagulant is desirable and extremely predictable. FPC is generally considered appropriate for vegetarians and is Kosher and Halal but is not organic. FPC gives the highest

dry matter yield of the coagulants compared here, with a generally reasonable price considering the cost to yield ratio. Camel chymosin, a FPC coagulant derived from camel and not bovine, is becoming more widely used in the market place but is not yet accepted by all markets. This product is considered suitable for Kosher, Halal and vegetarians. It is also extremely efficient at clotting milk and is less proteolytic than other coagulants, allowing for a longer shelf life in high moisture cheeses and less bitterness due to the slower breakdown of the B-casein in the cheese.

### **Microbial Coagulants:**

Microbial coagulants are not extracted or derived from calf stomachs but are instead sourced from fungi that produce proteolytic enzymes. Given the sourcing method, microbial coagulants can be considered Kosher, appropriate for vegetarians and organic. To create a gelling effect similar to chymosin, the fungi usually of the genus *Mucor* are grown under fermentation conditions, then the fungi's proteolytic enzymes are purified and concentrated to yield a coagulant. Microbial coagulants generally have a higher rate of proteolysis and therefore can result in reduced yields and can produce off-flavors in cheese including bitterness. Microbial coagulants, however, are the coagulant of choice in some Asian markets. There are very few concerns with sourcing of microbial rennets as they are generally recognized as safe. The sourcing for this variety of coagulant is predictable and there is a secure supply at a low price per gallon. Today, there are several generations of microbial coagulants on the market all of which offer slightly different yields. In general, microbial coagulants' dry matter cheese yield can be slightly lower than calf rennet and FPC so it is important to consider a cost to yield ratio when considering which rennet to use.

### **Alternative Rennets:**

Vegetable and/or plant coagulants are also used in many parts of the world, but they are not yet commercially produced. Traditional plant or vegetable coagulants generally come from flowers such as a thistle variety known as *Cynara cardunculus*. When considering this method of coagulation note that it may not be successful in all varieties of cheese. This coagulant variety also has a high potential for bitterness and low yield. Plant and vegetable coagulants are truly in their infancy but as time goes on these varieties may grow in popularity.

### **Conclusions:**

When considering which coagulant to use in your cheese manufacture, it is important to look at the big picture. Generally speaking, aged cheeses and specialty cheeses are



## FAQ: Yogurt Varieties

As interest in cultured products continues to grow, the Wisconsin Center for Dairy Research and the Center coordinated USDEC Dairy Technical Support line staff have received questions from companies and consumers alike regarding the differences between the many varieties of yogurt available today.

Together, with the help of Dairy Technical Support line staff member Susan Larson, Ph.D and the CDR cultured products group, we have compiled a quick fact sheet of information on several varieties of yogurt. We hope that this will serve as a valuable resource for both your company and customers as you continue to grow and potentially field related questions.

### Varieties of Yogurt

Within the dairy case, you can find a wide range of yogurt options to meet a variety of health and wellness needs, as well as taste and/or flavor profiles. Below, you will find seven of the most popular or common cultured products described in detail.

**Greek** – Greek yogurt is generally noted to have a thicker consistency as well as a tangier, less sweet flavor than traditional yogurt. Greek yogurt may contain two or more times the protein of traditional yogurt, and 0 to 10 percent fat. While there is a standard of identity for the traditional yogurt, there is no U.S. standard for Greek yogurt. Therefore, it can be formulated and processed in a variety of ways to thicken the body. The use of stabilizers, fortification with dairy solids and the separation of solids from whey by centrifugation or



membrane technology are all acceptable ways of processing the yogurt to thicken the body. Greek yogurt is available in plain or flavored varieties.

**Icelandic** - Traditional Icelandic yogurt is made from fermented and strained skim milk and is generally nonfat. This variety is also higher in protein, potentially containing 2-3 times the protein of regular yogurt. The texture is generally rich and creamy and the taste is more rich and mild than traditional or Greek yogurt, though the product is often quite tangy and acidic (pH < 4.0).

**Swiss or custard** – Also referred to as “blended” yogurts, this variety contains fruit and yogurt mixed together for individual servings. To ensure firmness or body, a stabilizer such as gelatin may be added to this variety.

**Lassi (India)** – A fermented milk or yogurt drink that comes in varieties including plain or flavored with fruit or aroma compounds, mint or spices such as cumin or chilli. The texture and body of this product varies greatly.

**Dough (Iranian)** – A fermented and diluted yogurt drink. It may be salted, but no sugar or flavoring ingredients are added. Recently, dough has been carbonated to produce a fizzy variant of the traditional product.

**Kefir** – A fermented milk drink that tastes tart and tangy. Sold in plain and flavored varieties.

**Soy yogurt** – Technically not a yogurt as it does not contain milk.

### *Curd Clinic: Rennet/Coagulants Continued*

more sensitive to flavor differences resulting from the use of different sources of rennet than are commodity cheeses or cheeses that are sold as fresh or mild cheeses. Consider your target market, for example, do consumers require Kosher, Halal or vegetarian certification? Furthermore, if your whey is further processed into edible food components many customers require their whey products to be Kosher or Halal which will necessitate using Kosher/Halal coagulants. Even though FPC coagulants aren't legally considered GMO, the fact that they are produced by GMO organisms can affect some customer's acceptance of cheeses made with these coagulants especially in the category of high end specialty artisanal

cheeses. Also, consider the cost to yield ratio carefully as a low price per gallon of coagulant does not guarantee overall savings. The cost of the rennet used to coagulate milk is easy to measure, but the measurement of seemingly small, but ultimately significant yield losses is much more difficult to measure and can be easily overlooked. Also, consider that low cost rennet with a low strength or concentration will mean you need to use more of that coagulant, possibly resulting in a more expensive outcome. Ultimately, you must factor in coagulant cost, yield, as well as flavor and texture benefits and customer acceptance of your cheeses before determining the true cost and acceptability of any coagulant choice.

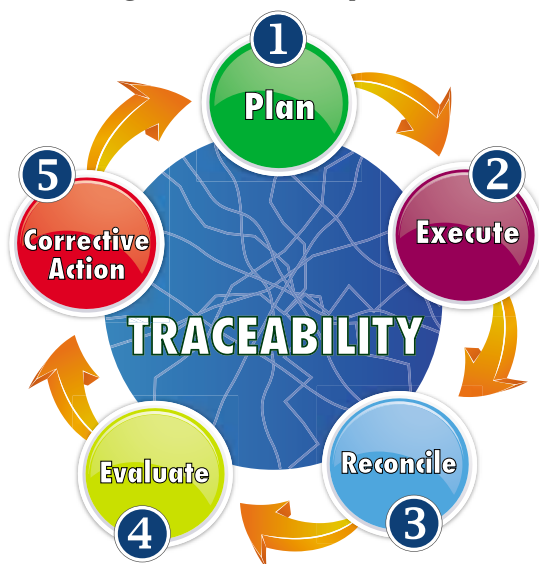
# Traceability

Marianne Smukowski, Matt Mathison, Theresa Hurd

According to the U.S. Food and Drug Administration (FDA), in 2011 alone, there were more than 1,853 recalled products reported by the Center for Food Safety and Applied Nutrition (CFSAN). A costly event, recalls or traceability issues can not only cause the company involved in the recall to lose time and money in resolving the issue, but also customer trust and loyalty. Fortunately, many recalls and their related problems can be minimized if a proper plan is put into place and guidelines are followed.

Instituting a Hazard Analysis & Critical Control Points (HACCP) system as well as HACCP-based Standard Operating Procedures (SOP) are among the most essential structures a company can have to combat recall issues. As the new Food Safety Modernization Act, aimed at preventing foodborne illnesses and subsequent recalls comes into effect, one of the most important steps a company can take in preventing a traceability issue is to develop and execute a traceability exercise at least once per year for each of the following individual categories; packaging material, ingredients and finished products. A traceability exercise will help to ensure that everyone knows their personal roles and responsibilities and will identify any gaps in the system that put the company at risk.

## Performing a Traceability Exercise



Essentially, a traceability exercise includes a 5-step process. The first step of the process, planning, will help to determine who is involved, what components will be traced and define when the exercise will take place. As for the execution, be sure that the simulation includes generating documents necessary

in a real recall situation as this is important in determining your preparedness should a real recall event occur. During the reconcile stage, it is important to assign at least one person to be responsible for reconciliations. Also consider using a spreadsheet or other organized ways of compiling data. During the evaluation step, be sure to involve the entire team in the process. Consider each functional area and what pieces were successful and which could use improvement. Define your solutions and finally, take corrective action. Be sure to assign final dates for corrective actions to be complete and assign someone to verify and validate all submitted corrective actions.

As you complete the traceability exercise, reflect on this checklist to be sure that you have considered all of the necessary information.

- Be able to step forward and backward in regards to your product, packaging and ingredients.
- Consider your documentation of liquids (volume vs weight); be consistent
- Document the time it took to complete each portion of the traceability exercise
- Rework your rework plan, in other words consider your use of rework and how this expands recall efforts, “break the chain”
- Assess your HACCP system

## Documentation:

Be sure to have a copy of your Sanitation Standard Operating Procedures (SSOP), Environmental Monitoring Program, and Good Manufacturing Practice (GMP) on hand at all times. Other documents to consider include an: In-plant Product Recall Program Sheet (See an example at [www.cdr.wisc.edu/programs/safety/resources](http://www.cdr.wisc.edu/programs/safety/resources)) and a FDA Request for Information to Monitor a Food Recall. Information regarding FDA requests for information can be found at: [www.fda.gov/Safety/Recalls/IndustryGuidance/ucm129259.htm](http://www.fda.gov/Safety/Recalls/IndustryGuidance/ucm129259.htm)

## Conclusions:

Consider this: When you execute a traceability exercise you are,

- Establishing a team that is prepared should a traceability issue arise
- Able to discover and fix any short comings your recall plan may have
- Developing or locating copies of all required documents
- Taking the steps needed to keep your business and customers safe

In the end, the traceability exercise should provide staff with the knowledge and experience needed to respond should a recall situation arise. Remember, by performing this exercise at least once annually, you are demonstrating a commitment to your customers while also benefitting your company.

# Cheese Plant Equipment

The CDR Cheese Pilot Plant, located within Babcock Hall, serves the dairy and food industry by offering access to pilot scale equipment and experienced staff, including Wisconsin licensed butter and cheesemakers. CDR staff are here to assist in planning and coordinating cheese projects and to support CDR Cheese Applications and Research projects. The Cheese group would like to highlight a few unique and important pieces of equipment below. To access a full list of equipment please visit [www.cdr.wisc.edu/programs/cheese/cheese\\_equipment.html](http://www.cdr.wisc.edu/programs/cheese/cheese_equipment.html) If you have any questions about CDR's cheese processing equipment, please contact: John Jaeggi, Coordinator of the Cheese Industry and Applications Program, Email: [jaeggi@cdr.wisc.edu](mailto:jaeggi@cdr.wisc.edu), Phone: 608-262-2264.



## 6 Cheese Vats

**Manufacturer/Model:** Stoelting LV 60

**Capacity:** Maximum capacity of 600 lbs—these vats work best when filled with between 250 and 550 lbs of milk

**Description:** CDR has six square, stationary, jacketed stainless steel open cheese vats capable of manufacturing everything from cottage and cream cheese to ricotta and parmesan—we have yet to encounter a cheese that cannot be made in these vats. The open style allows greater flexibility in producing different products and makes the vats ideal for teaching and research. We have cheese knives ranging in size from ¼” to 1” and a full complement of auxiliary equipment including a pasta filata mixer, pumps, pre-press, press, etc.



## Pasta Filata Mixer

**Manufacturer/Model:** Supreme 640

**Capacity:** Typically process ~50 lbs of cheese curd in 10 minutes

**Description:** The Supreme 640 is a steam injected mixer with several extrusion heads - allowing for the manufacture of loaf, ball, string and many other styles of Pasta Filata cheese. The water temperature and auger speed are adjustable and temperature probes are positioned to monitor water and cheese temperatures as the mixer is running.



## Cream Cheese Separator

**Manufacturer/Model:** Sharples DS 2

**Capacity:** Minimum feed material batch size is 300 lbs with a minimum fat content of 9%

**Description:** The CDR separator is used to separate solids from serum—it is the only cream cheese separator in the U.S. that is available for contract research. CDR's cream cheese line includes ripening vessels, the separator, a swept surface tank where the moisture can be adjusted and salts and stabilizers can be added and a homogenizer to smooth the final product. Note: A standard commercial butterfat separator is available in the Babcock Hall Dairy Plant.

## Cheese Forms

**Description:** CDR has a wide variety of cheese forms available for drained and pressed cheeses—and we are bringing in new specialty cheese forms all the time!

- 10, 20, and 40 lb stainless steel rectangular block forms
- Stainless steel perforated rectangular forms for Brick, Muenster, and Havarti-type cheeses
- 12 lb plastic micro-perforated wheel forms—idea for gouda
- Plastic perforated round forms with and without bottoms – for brie/camembert and crottin-type cheeses
- 20 lb plastic perforated wheel forms
- Plastic perforated rectangular Feta block forms
- 7 lb Manchego forms with woven decorative insert
- Round perforated stainless steel forms for Blue cheese and other soft cheeses
- Plastic baskets for ricotta and other naturally drained cheeses



- A variety of round and rectangular plastic forms
- 1 and 2 lb plastic wheel forms
- 20 and 40 lb block forms and Colby horn forms designed for use with the DR Tech Vacuum Press
- Soft curd draining bags - re-usable muslin cloth bags for traditional draining of cream cheese, quark, or sour cream or to pre-drain brie, camembert or blue cheese curds



## Extruder / Portioner

**Manufacturer/Model:** Reiser Vemag Robot 500

**Capacity:** minimum batch size of 40 pounds of cheese

**Description:** The CDR Vemag presses cheese together using a double screw system aided by vacuum. This type of machine is widely used for Latin-American cheeses such as queso fresco. The Vemag is also particularly useful in double milled applications—such as incorporating fruits or nuts into ground cheese. After the cheese is reformed, it can then be portioned with the automatic portioner and guillotine. Also available are extrusion tubes of various lengths—several of the tubes include water jackets to allow the product to be tempered as it exits the extruder.



## High Shear (Bowl Chopper-Style) Processed Cheese Cooker

**Manufacturer/Model:** Stephan UM/SK5

**Capacity:** 5 pound maximum batch size

**Description:** The CDR Stephan UM/SK5 is a mobile, jacketed stainless steel cooker that utilizes indirect and/or direct steam for small batches of processed cheese. This cooker has a swept surface and main agitator (with the capacity to utilize either sharp or dull agitator blades) and a vacuum system. The unit's high shear main agitator makes it ideal for European-style cheese sauces, spreads, etc.



### Shredder

**Manufacturer/Model:** Urschel CC-D

**Description:** A stainless steel commercial shredder—this model has several shredding heads available (Feather, V-cut, Crinkle), which makes it ideal for examining cheese machinability and preparing samples for further testing.



### Low Shear, Double Screw Process Cheese Cooker

**Manufacturer/Model:** Blentech CC-0025-V

**Capacity:** 20 pound maximum batch size

**Description:** With direct and indirect steam and a vacuum system, this jacketed cooker is ideal for U.S.–style processed cheese block manufacture.



### Dairy Product Aerator

**Manufacturer/Model:** Haas-Mondomix BV Continuous Aerator, Type Mini-Mondo Mixer

**Capacity:** 10 pound minimum batch size

**Description:** Used in the manufacture of soft dairy-based products, this research–scale mixer blends product with nitrogen to attain a specific overrun and a lighter, more spreadable texture.



### Eyed Cheese Pre-Press

**Manufacturer/Model:** Stoelting

**Capacity:** Four separate compartments and two pneumatic rams with an 80 psi maximum

**Description:** This stainless steel pneumatic pre-press presses the curd under whey, allowing for minimal mechanical openings and good eye formation in cheeses such as Swiss and Gouda.



### Portable Cheese Vat

**Manufacturer/Model:** Kusel Equipment Co.

**Capacity:** maximum capacity of ~450 lbs

**Description:** This rectangular portable, jacketed stainless steel open cheese vat can be heated with either steam or an electric immersion heater. It includes cheese knives and a draining screen, but requires manual agitation.



### Batch Butter Churn

**Manufacturer/Model:** W. M. Sprinkman Corp Custom Built Batch Butter Churn

**Capacity:** 30–240 lbs of cream yielding ~15–120 lbs of butter

**Description:** A portable, research-sized unit that can churn sweet, whey or cultured cream.

Information regarding more cheese plant equipment is available on the CDR website along with a downloadable pdf reference sheet.  
[www.cdr.wisc.edu/programs/cheese/cheese\\_equipment.html](http://www.cdr.wisc.edu/programs/cheese/cheese_equipment.html)

## News from CDR

The Wisconsin Center for Dairy Research congratulates Gina Mode, Assistant Coordinator Cheese Industry & Applications, on her recent completion of the Wisconsin School of Business Executive Education Management Skills Program for Dairy Professionals.

This certificate program, created in partnership with the Wisconsin School of Business and the Wisconsin Cheese Makers Association, includes a total of four modules consisting of eight days of training, group discussions, case studies and more. All modules take place at the Fluno Center for Executive Education on the UW-Madison campus with each module repeating annually. All participants who wish to receive a certificate must complete all modules within two years of entering the program. Those who complete the program are honored at the International Cheese and Technology Expo hosted by the Wisconsin Center for Dairy Research and the Wisconsin Cheesemakers Association (WCMA).

“This is an outstanding program that helped me gain skills to better assist the industry,” said Mode. “The instructors customize the material in a way that really addresses the unique aspects of the dairy industry.”



Gina Mode, CDR (First on left)

If you are interested in the Management Skills Program for Dairy Professionals, please contact Mal Jeffris, Wisconsin School of Business Custom Executive Education, at (608) 441-7355 or email [mjeffris@exed.wisc.edu](mailto:mjeffris@exed.wisc.edu).



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## American Cheese Society (ACS)

CDR is proud to announce that staff members Gina Mode, Luis Jimenez-Maroto, Mark Johnson and Marianne Smukowski have been selected as judges for the American Cheese Society's 29<sup>th</sup> annual conference and competition in Raleigh, North Carolina, August 1-4, 2012.



## IFT

Several CDR staff members attended the Institute of Food Technologists (IFT) Annual Meeting & Food Expo in Las Vegas June 25-28, 2012. CDR presented several prototypes in collaboration with USDEC while also sharing staff knowledge and research with those in attendance. Thanks to all who stopped by to see the latest from CDR.



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## ICTE

CDR thanks the more than 2,800 people who attended the 2012 International Cheese Technology Expo, April 10-12, 2012 at the Frontier Airlines Center in Milwaukee, Wisconsin. We invite you to join us April 17 & 18, 2013 for the Wisconsin Cheese Industry Conference (WCIC) in La Crosse, Wisconsin and again, April 22-24 for ICTE 2014 in Milwaukee, Wisconsin. For more details please visit [www.cheeseexpo.org](http://www.cheeseexpo.org)



## CDR Welcomes Two New Staff Members

### Mark Smith, Information Processing Consultant

Mark has joined CDR, filling the role previously held by Wallace Barrow. He maintains the computer systems used by the staff and researchers of the Wisconsin Center for Dairy Research. He also assists in evaluating and developing IT solutions to further the Center's goals. He comes to CDR with a B.S. in Computer Science from UW-Madison and several years of work experience with UW-Madison's Division of Information Technology both as a student and as an Academic Staff member. Mark enjoys working in IT as the field evolves at a fast pace and presents a constant learning experience.



### Emma Watry, Research Cheesemaker

Emma officially joined the CDR staff in June as a Research Cheesemaker, but has been working at CDR as a student hourly for more than a year. She comes to CDR with a degree in Dairy Science from UW-Madison. Growing up on a dairy farm in Elkhart Lake, Wisconsin, Emma learned to appreciate the dairy industry and is now proud to work for the Center, which is primarily funded by dairy farmers. Emma will join the Cheese Industry and Applications group as a cheesemaker, but will also spend some of her time working with the Processing group on various projects.



## Sign up for the Pipeline Newsletter

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### The Dairy Pipeline

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# Building Campaign Update

CDR would like to thank all of the individuals and companies who have donated so far to the Campaign to Secure Wisconsin's Dairy Future. **To date we have pledges of around \$12 million dollars and are continuing to work towards our goal of at least \$16 million.** CDR is proud to be partnering with the dairy industry and the State to build a world-class facility that will secure our dairy future. It will be essential for us to come together and design a building that meets the current and future needs of the modern dairy industry. To assist with this next step, CDR Director John Lucey will be assembling a committee, with expertise in the design and construction of modern dairy facilities. We are also arranging several regional meetings around the state to discuss the project which will give more opportunities for our dairy plants and suppliers to hear about the project and provide feedback on the proposed facility. These meetings will be arranged through the local cheesemaker associations.



For more information on the building campaign or to donate please visit [www.cdr.wisc.edu/building](http://www.cdr.wisc.edu/building).

For more information on Bill Wendorff's Short Course Million Fund Challenge please visit [www.facebook.com/shortcoursemillionfund](http://www.facebook.com/shortcoursemillionfund)

**Thank you to all the individuals and companies who have donated to the building campaign so far.**

- |                                       |   |  |
|---------------------------------------|---|--|
| ● <b>Agrimark</b>                     | ● <b>Eau Galle</b>                      | ● <b>Masters Gallery Foods</b>               |
| ● <b>Agropur</b>                      | ● <b>Ellsworth Cooperative Creamery</b> | ● <b>Marathon Cheese</b>                     |
| ● <b>Arla Foods</b>                   | ● <b>Fair Oaks Farm</b>                 | ● <b>Organic Valley</b>                      |
| ● <b>Arthur Schuman</b>               | ● <b>Foremost Farms</b>                 | ● <b>Saputo Cheese USA</b>                   |
| ● <b>Baker Cheese</b>                 | ● <b>Galloway Company</b>               | ● <b>Sargento Foods</b>                      |
| ● <b>BelGioioso Cheese</b>            | ● <b>Glanbia</b>                        | ● <b>Sartori</b>                             |
| ● <b>Dr. Bill and Hallie Wendorff</b> | ● <b>Grande Cheese</b>                  | ● <b>Schreiber Foods</b>                     |
| ● <b>Bob Bush</b>                     | ● <b>Great Lakes Cheese</b>             | ● <b>Soft-Trace</b>                          |
| ● <b>Brewster Dairy</b>               | ● <b>Hilmar Cheese</b>                  | ● <b>Steve Braun</b>                         |
| ● <b>Chr. Hansen</b>                  | ● <b>Hennings Cheese</b>                | ● <b>TC Jacoby</b>                           |
| ● <b>Crystal Farms</b>                | ● <b>Ivarson Inc.</b>                   | ● <b>Walter V. Price Family</b>              |
| ● <b>Dairy Farmers of America</b>     | ● <b>Klondike Cheese</b>                | ● <b>Wisconsin Milk Marketing Board</b>      |
| ● <b>DSM</b>                          | ● <b>Land O' Lakes Inc.</b>             | ● <b>Wisconsin Cheese Makers Association</b> |

**A special thanks to Campaign Co-Chairs  
Lou Gentine, Sargento Foods & Dave Fuhrmann, Foremost Farms**

## Master Artisan Short Course "Impact of Starter Cultures, Adjuncts, and other Microflora on Cheese Flavor, Texture, and Functional Properties"

The Wisconsin Center for Dairy Research will be sponsoring the 2012 Master Artisan Short Course Series on September 18-19 | Cost: \$500.00 | Location: Babcock Hall | Register on-line at [www.cdr.wisc.edu/shortcourses](http://www.cdr.wisc.edu/shortcourses)

This course will explore the diversity of natural cheeses, specifically specialty and artisan cheeses in today's market. The course will cover the proper selection of lactic cultures, adjuncts and other ripening microflora for natural cheese production and ripening. Discussions will focus on basic requirements for each of the cultures, proper handling of each of the cultures and the potential use of a combination of cultures and adjuncts to produce unique flavors or provide unique functionalities in natural cheeses.



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## Short Course Calendar:

Milk Pasteurization, August 7-8

Master Course on Cultures, September, 18-19

Cheese Tech Short Course, October 1-5

Dairy Ingredient Manufacturing, October 16-17

Cheese Grading Short Course, November 7-9

Waste Water Short Course, November 13-14

Ice Cream Makers Short Course, November 28-30

**For detailed information on each short course**

[www.cdr.wisc.edu/shortcourses](http://www.cdr.wisc.edu/shortcourses)

## Events

American Cheese Society (ACS), August 1-4

National Milk Producers Federation (NMPF), October 29-31