

Fortifying Dairy Foods

Part 1: What are the Rules?

by Emerita N. Alcantara, Ph.D., R.D.
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The Nutrition and Labeling Act (NLEA) created a new category of modified foods for products named by using a **nutrient content claim** with a **standardized food name** (for example, Reduced Fat Cheddar Cheese). It is now possible to make lower fat versions of standardized dairy products, as long as the product meets the FDA requirements for this new category of modified foods. Given the increased production of reduced fat foods, many manufacturers are wondering when it is mandatory to add vitamins to cheese and other dairy products.

One of the FDA requirements is that the modified food **must not be nutritionally inferior** to the regular product, or it is considered an imitation and must be labeled as such. Nutritional inferiority is defined as any reduction in the content of an essential nutrient present in a measurable amount. Measurable amount is defined as 2 percent or more of the Daily Value for protein, vitamins or minerals per reference amount of the product.

Cheese

What is the practical significance of this requirement for cheese? Since vitamin A is a fat-soluble vitamin, removing fat when making



lower fat cheese also removes some of it. Vitamin A is one of the nutrients present in measurable amounts in cheese. Therefore, you must add vitamin A to the modified product to restore the level to that found in the regular product. For Reduced Fat Cheddar Cheese, for example, this means restoring the vitamin A in one serving to 6 percent of the Daily Value, and declaring the vitamin A preparation as one of the ingredients in the ingredient statement.

Fluid Milk

In the case of fluid milk, the **current standards** require the addition of 2000 I.U. of vitamin A per quart, or 500 I.U. per cup, to the lower fat milks (2%, 1% and skim milk). Vitamin D addition is optional; however, most fluid milks are fortified with this vitamin, in line with public health recommendations.

Under the **new FDA rule** published on November 20, 1996 (effective January 1, 1998, but compliance can begin immediately), the lower fat milk standards are repealed and the whole milk standard will now be the basis for the lower fat milks. This means lower fat milks must be fortified with vitamin A to at least the level present in whole milk, or 300 I.U. per cup (6% DV). However, FDA encourages dairy processors to continue to fortify to the current level of 500 I.U. of vitamin A per cup (10% DV). The Agency indicated that it could require this level at a later time if it noticed a significant decrease in the number of products fortified to the 10% DV level. The Milk Industry Foundation (MIF) points out one additional benefit to fortifying to this level—the 10% DV level allows milk to be promoted as a “good source” of vitamin A. Claims of this nature are an integral part of advertising and promotion efforts for milk. Thus, MIF strongly urges all processors to continue fortifying with vitamin A at the current levels. Vitamin D addition remains optional. However, historically, the dairy industry has fortified milk with vitamin D, and this practice is credited for the virtual elimination of rickets in the U.S.

Yogurt

The standards of identity for lower fat yogurts were also going to be repealed in the November 20, 1996 rule, but the Agency deferred action for 120 days. (We are still waiting to hear the outcome of discussions with yogurt manufacturers.) Concerns were raised about the technical difficulties and economic impact

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Disaster Recovery Planning: The Weyauwega Evacuation

By Richard Wagner, Ph.D., Weyauwega Milk Products, Inc.

On Monday, March 4th, 1996, at 5:50 A.M., 35 cars of an 81 car Central Wisconsin train derailed about 400 feet north of our cheese plant. This derailment developed into a disaster, causing residents and businesses within a two mile radius of the site to evacuate for about 2 1/2 weeks. Amazingly, the derailment and subsequent fire caused no direct injuries.

Our disaster recovery plans at Weyauwega Milk Products are very different today because of everything we learned. I'll share some particulars of this disaster, and then recommend a recovery planning approach.

The March 4th derailment in Weyauwega involved 14 cars carrying, in total, 1,000,000 lb. of propane and, for added effect, two train cars of sodium hydroxide caustic. About 180,000 lb. of caustic spilled and raised the pH of a ditch, and then the Waupaca River.

The derailment was caused, most likely, by a failed switch and by a very rare type of iron rail failure. This failure resulted in a

longitudinal split of the rail, with one half curling upward and cutting a large hole in one of the propane cars. Liquid propane began to drain from the car beside a local feed mill, adjacent to the tracks.

I talked to three eye witnesses who described torches of flames that began shooting from the wreckage in the area of the feed mill. All of a sudden, the propane puddle that stretched a couple

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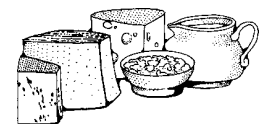
of requiring vitamin fortification for lower fat yogurts. Unlike the milk industry, which has the experience and equipment in place for adding vitamins to lower fat milk products, the yogurt manufacturers have significantly less experience in producing products that are fortified with vitamin A. The 120-day deferral, according to FDA, will give an opportunity for the yogurt industry to meet with the Agency to discuss its progress in addressing vitamin A fortification. MIF indicated it would meet with yogurt manufacturers to discuss the issue further.

Sour Cream

As part of the November 20, 1996 rule, FDA revoked the standards of identity for sour half-and-half and acidified sour half-and-half. This means that the sour cream standard will serve as the basis for the lower fat products, e.g., reduced fat sour cream, and the modified products will need to be fortified with vitamin A to be nutritionally equivalent to regular sour cream. Although one might argue that sour cream manufacturers, like yogurt manufacturers, will find the fortification requirements burdensome, FDA believes that the sour cream industry should already possess the necessary equipment for vitamin fortification since they have been marketing products such as light sour cream and nonfat sour cream which require the addition of vitamin A for nutritional equivalency.

Cream Products

The standards for half-and-half, light cream, heavy cream and light whipping cream remain on the books. The standards do not require vitamin fortification. As an aside, an objection was raised regarding the continued use of the term "light" in light cream and light whipping cream, given that these products have not been modified to qualify for the nutrient content claim, "light," as defined by the Agency. FDA rejected the comment stating that the term "light" can also be used to describe physical or sensory characteristics of a food and noted that light cream and light whipping cream have a different texture from heavy cream. FDA stated, however, that if the Agency finds that consumers are being misled by the use of "light" on cream products, future action on these standards may be necessary.



Editors Note: Part 2 of Fortifying Dairy Foods will cover optional vitamin additions, for example fortifying with Vitamin E. Also, I promise to come up with the answers to the practical questions surrounding vitamin fortification—calculating how much to add, and is dispersion in cheese uniform? If you already know the answers, please call me at (608/262-8015). ☺

of hundred feet along the tracks, plus all of the fumes, erupted into a huge fire ball. This initial fire ball was very much like the flame you get when you turn on a gas grill and sometime later throw in a match. You may have noticed that the initial puff of flames fills the grill, licks at its interior, and then recedes back. This happened after the derailment on a much larger scale. Eye witnesses told an amazing story about the fireball extending almost 1500 feet high and, down wind, licking the entire top of the west half of our plant's roof. Fire also licked at the houses west across the street and at the north side of a neighboring business building, which was 1,000 feet south of the train wreck. It was dark at the time and a dairy farmer, ten miles south of the wreck, reported seeing the fire ball. It was so bright that it caused his automatic dusk to dawn light to go out temporarily. Then, the flames from the feed mill and the train cars, all piled up like wood in a camp fire, receded into a fire about 300 feet wide, 80 feet deep, and 300-400 feet high.

Preventing a major explosion

Fire departments from up to 45 miles away were alerted and began to respond. Five local fire departments sprayed 6,000 gallons of water per minute on the fire for about 30 minutes. Although this had no noticeable effect on the fire, it may have kept it from spreading to a lumber company, gas station and local homes. Since our buildings are all concrete, we weren't too worried yet. In retrospect, some people think that this early dousing may have kept the pile of propane cars cool enough to prevent a major explosion right then. At about this time, though, the city water system was running dry and a county emergency response official arrived. He took one look at the engineer's cargo manifest and ordered everybody back three-fourths of a mile. Some minutes later, when the state emergency response coordinator arrived and more data was available, the command center was set back a total of 1 1/4 miles and a 2 mile evacuation zone was set up. This involved a one-mile "Hot Zone," and another mile out, "Warm Zone."

All highways in the two-mile zone were shut down. There was one dairy farm in the hot zone and that farm lost many cows to mastitis when they weren't milked. The warm zone contained quite a few dairy farms and those herds were allowed to be milked and fed, but people, including milk haulers, had to come and go quickly. At least one dairy producer in the warm zone stayed alone on his farm, refusing to leave. He was heard from only after his bulk milk tank was full.

A cheesemaker's worst nightmare unfolded at our cheese manufacturing company. In our business we take in milk around the clock, and we make cheese and whey products seven days a

week. As you know, historically, cheese makers are often good-natured workaholics, who only feel right if the cheesemaking process is ongoing. This is because we have to keep emptying milk tanks to stay ahead of the cows — which don't stop milking for any reason.

An immediate evacuation

Since the train wreck and fire was so close, it was initially decided to shut operations down and cleanup. About a half hour into that process, firemen entered the building and ordered an immediate evacuation. At that very moment, some major decisions had to be made by people in all departments. We really didn't have a list of "things to do when ordered to leave." As it turns out, two supervisors bolted in opposite directions. In the

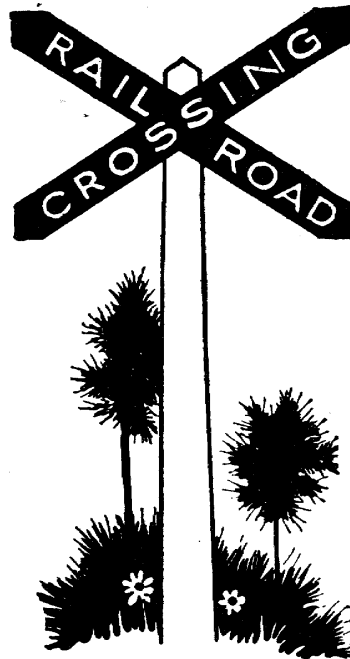
moments before leaving, one ran through the cheese plant to turn off the cheddaring machine and the main pasteurizer. Vat agitators were left running on hold to keep curd from knitting and settling to the bottom of the vats. The other supervisor ran through the whey department to shut down the whey evaporator, a cleaning CIP system, the COW water system, separators, and lactose refiner and dryer. It helped, of course, that the control systems had panic stop switches and that our whey dryer had just been washed and not yet started back up. All crystallizer agitators were left running to avoid lactose crystals settling out on the bottom of the crystallizer tanks. Fortunately, the electricity stayed on in most of the community during the evacuation, including the cheese plant. In addition to the agitators left on, the electric lights were also left on, which provided significant heat during sub-zero weather we had early in the evacuation period. Also noteworthy are the systems that we have had

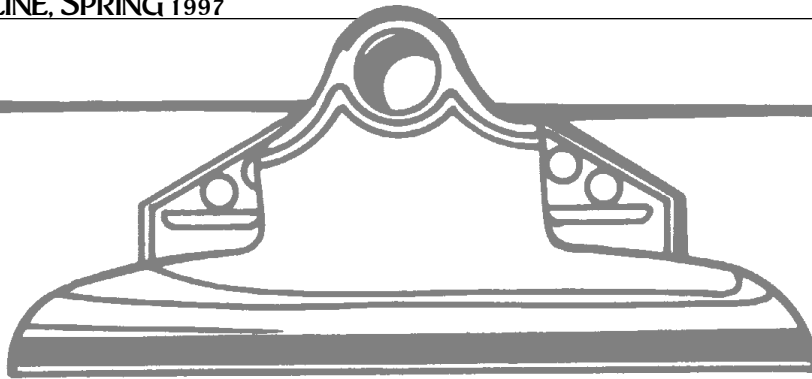
on the roof which pump a lot of air through the cheese plant to minimize phage virus contamination. These were shut off to prevent smoke from coming in, although smoke never was a problem. In this case it was non-toxic, and it also rose up very high. If the air units would have stayed on, we may had a lot more pipes freezing. The natural gas gate station, which sends gas to the community, was shut down because the main pipeline coming in underground was, of all places, directly under the train wreck. Officials feared a gas leak, and the threat of more fires due to leaking gas.

Backup computer tapes

All the while we were evacuating, everyone simply assumed we would be back within a few hours, certainly not days or weeks. Even so, we were lucky that someone decided to take our backup computer tapes. They were very valuable later when we needed to

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Planning disaster recovery

What did we learn from this experience about planning disaster recovery? We developed an outline listing the important factors that categorizes the disaster plan into the following three chronologically related areas. Note that these plans could also apply to bomb threats and any other crises requiring evacuation.

- ☞ Manage the evacuation process
- ☞ Manage the disaster while evacuated
- ☞ Manage the cleanup at the end of the evacuation period

Manage the evacuation process

Things to do when ordered to leave

Develop a concise list of “things to do” when ordered to leave immediately

TIER II hazardous chemicals

When evacuating, remove TIER II information which spells out *which* hazardous chemicals are on-site, how much, where located, and who manufactures them.

Keep a TIER II report copy at a location away from the site.

Employee assembly points

Plan for more than one employee reassembly point.

Pictures of property

Keep some pictures or a video of the business property and equipment at a remote site for accurate damage claims later.

Computer records

Either remove copies of critical computer, telephone, and other records, or keep copies in a safe place off the premises.

Manage the disaster while evacuated

Remote headquarters

Be prepared to operate your business from a remote site.

Have in place a direct phone line hookup to computer controlled equipment for remote control as needed. We tried to shut off certain motors by telephone, but our links had not been fully established at the time of the incident. We are working on this now.

Relations with the neighbors

Don't burn any bridges with neighboring competitors. Ideally, during a disaster, the ground rules of competition could be put on hold because you'll need to look to others for help.

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produce February's milk payroll. An appropriate computer to use the tapes on was hard to find, but we finally found one a hundred miles away in Manitowoc.

One other concern was that our original reassembly point for employees evacuating in an emergency was our north parking lot. In this case, it happened to be adjacent to the train wreck. Employees gathered on the south side where a person with the day's duty roster checked them off.

Potential explosion

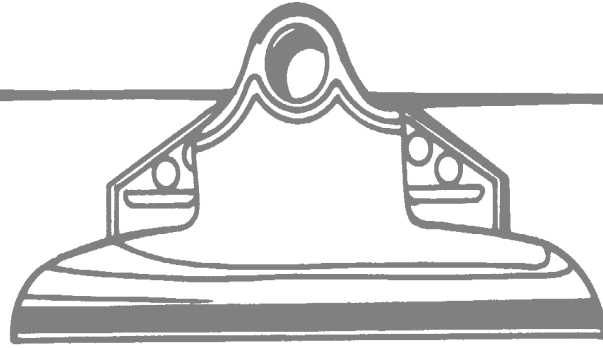
Throughout the time of evacuation, what really had the emergency response people worried was the potential for a horrendous explosion called a "BLEVE." This is an acronym standing for "Boiling Liquid Expanding Vapor Explosion." It's not pretty. The potential explosion in Weyauwega would have destroyed all buildings and life within one-half mile. The shock wave would have collapsed lungs and severely damaged buildings at one mile. At one and one-half miles, it would have broken ear drums and windows and still involved flying debris, including the train cars.

During the evacuation, we not only had concerns getting milk trucks through road blocks to get to farms within the warm zone, we also had to figure out what to do with all of our milk once it was picked up. We pick up milk from 524 dairy farms in Waupaca County and in 14 other surrounding counties. At the time of our evacuation, 15 of our 19 milk trucks were out picking up milk, which was good. During the evacuation, two maintenance men drove two of the other four rigs out of the area, so they could be used as needed.

Milk pick up

As you know, in Wisconsin the milk purchase and hauling business is extremely competitive, to the advantage, of course, of our dairy producers. If we would have been unable to continue routine milk pick up and payroll functions, our dairy producers, none of whom are under contract, may have

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Employee relations

During an extended evacuation, consider paying the employees directly, as opposed to using unemployment. It could be simpler in the long run and more fair to the employees. Also, keep employees informed, consider hosting a dinner for them. A big issue for us involved the paid plant employees who were not working, versus the paid employee milk haulers who were working. Most of the working haulers missed a special dinner we put on and some pondered the interesting idea of being paid without working. Generally, we sorted out the differences in philosophies on this. The main point here is to try not to build walls between people.

Relations with agencies and the media

Set aside fears of working closely with state agencies and the media. They can be crucially helpful. Be proactive and positive.

Manage the cleanup at the end of the evacuation period

Product dump sites


Have product dump sites available (that's basic)

Water availability

Be prepared to do the cleaning without water, at least from its normal supply. During any boil order seek to use water under the boil order without actual boiling, but simply with documented chlorination and associated safe water tests, that should come from chlorination.

Working with contractors

Be ready to work with contractors to cleanup and thoroughly check out such things as boilers or ammonia compressors after extended shutdowns to prevent potential damage on startup.

One final comment about planning—don't get too paranoid about disaster readiness. No two disasters are exactly alike. So simply anticipate the need for flexibility. And when it happens to you, graciously accept the help that so many people of good will desire to give. We found that the empathy people had for us was quite overwhelming. I believe it's human nature to want to give more than receive. And certainly, just as Dorothy in *The Wizard of Oz* found out, there really is no place like home. 

scattered to other plants in the area. This would certainly have complicated our recovery and start up process.

At the time of the Weyauwega evacuation, we began to contact neighboring milk buyers and were very grateful for their empathetic and eager response to our needs. Of particular importance was the need to off-load milk without having to travel too far, so haulers could finish their work days in a timely manner. In this case, it helped that we were already going right by most of our competitor plants, so arranging for deliveries to those plants was relatively convenient. Thank you, plants!

Conducting business

During the disaster, we worked out of my cousin Bob Wagner's home in Waupaca, nine miles west of Weyauwega. Our wives were a great help at this point. Bob had two telephone lines with call waiting and we set up a third line and fax machine to handle the tremendous number of calls. We also had three cellular phones brought into action. Our four business telephone lines were forwarded to this location. The phone company provided this service on an immediate and free basis for all evacuated citizens and companies. I truly have a greater respect now for the job that telephone receptionists normally perform. Field activities, farm services, etc. were also conducted out of Bob's home.



The first week we paid employees out of the M & I Bank at Fremont, seven miles east of Weyauwega. The next week we had a temporary office set up for our secretaries in Waupaca, and we were able to pay employees and conduct other office functions from there.

Deluged by calls

By the second week, milk pickup and field services were operating in a routine manner and going smoothly. That is, until a newspaper reporter printed the flippant conjecture that it was going to be hard for us to pay our dairy producers for their milk. To add insult to injury, the remark was rolled into a paragraph with actual comments made by our management team. Thus the reader could easily assume that we actually had made the statement. This caused an immediate deluge of calls from concerned patrons, so we contacted all papers, radio and TV stations in our area to clearly state that there was no problem paying producers. The phones finally stopped ringing after a retraction was printed.

We normally maintain a low public profile. However, in this case, we were thrust into the spotlight. We had to change our attitude. It helped greatly to take news coverage contacts in stride. We were

up front, cheerful and truthful. This coverage actually helped, because company employees and patrons were always in need of information. Once things became a bit routine, about all we could do was wait, watch the news, and eat free food from the Salvation Army.

When the propane tanks were finally emptied and we got the green light to go back into town, everyone was so happy to get home and back to familiar work surroundings. This was the start of the recovery process. We made plant assessments on Monday and Tuesday of the third week. The Department of Agriculture inspectors worked with us. Their job was to determine which food products had to be discarded and which could be saved. Then they had to make sure the two categories did not get mixed up. These inspectors and their superiors did an exceptional job, showing empathy for us and our desire to get back up and running. They were there on time, when needed, and demonstrated a good deal of trust in our judgment and actions. This is where our normally good, cooperative working relationship with the department people paid off.

Dumping product

We had to dump a lot of product, including about 170,000 lb. of cheese in barrels. Around 450,000 lb. of milk ended up as fertilizer, and we pumped out around 250,000 lb. of whey concentrate. We also spread a couple of hundred thousand pounds of raw whey and some cream, all onto land permitted for spreading this type of material. We happened to have plenty of land already permitted. Noteworthy is the fact that our DNR contact called us to let us know that if we needed more land, he would find it and help however he could. Again, we saw a side of the regulatory people we weren't aware existed. They really wanted to help.

Amazingly, our cheese plant sustained only four small broken pipes due to freezing. About 17% of the 500 homes in town were not so lucky. In fact, there were so many leaking pipes in town, that the two water towers could not retain water even though they were fed by water pumps that could deliver 3600 gallons per minute in total. So before our city water could be restored, all of the homeowners had to have their homes assessed and water valves turned off. This process took three days because homeowners were not allowed back in mass. They each had to be accompanied by a policeman, a plumber, a building contractor, an air sampling technician, and a representative from the gas company. There were 20 such teams. All this assured an orderly recovery process, safety, and truthful reporting of damage.

While we were waiting for water, we removed product to discard. We had liquid in the CIP tanks, so we could circulate, soften up and pre-clean most equipment. Only a few pump impellers and seals had to be replaced due to wear. On Friday morning of the third week, the water came on, albeit under a boil order that lasted two days. As an alternative to boiling, the Ag Department

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CDR Researchers Develop a New Pizza Cheese

CDR scientists have come up with a cheese that seems to meet the needs of both cheese makers and pizza makers. In consumer taste panels conducted at Babcock Hall, this new pizza cheese passes consumer taste tests, too.

CDR researchers, led by Carol Chen and Mark Johnson, used instinct, years of experience, and the scientific method, to develop the new pizza cheese. Their approach involved adjusting cheese composition and limiting proteolysis to produce a cheese that mimics the functional characteristics of low moisture, part skim Mozzarella cheese. The CDR cheese shreds readily, melts nicely and maintains its stretch through three months of aging. Although we call it pizza cheese now, this new cheese may find a bigger niche as a food ingredient cheese.

Comparing CDR's pizza cheese to LMPS Mozzarella

50% less oiling off. During the mixing process for LMPS Mozzarella, heat and mixing permit the fat to coalesce and water to pool around the protein strands. Neither a mixer nor high temperatures are used in the pizza cheese process. Thus, the fat globules do not coalesce and they remain smaller within the cheese matrix. This means that the fat in CDR pizza cheese is less likely to pool during pizza baking.


50% fewer blisters. CDR's pizza cheese contains smaller pockets of water, which then produce fewer blisters than LMPS Mozzarella. When heated, the smaller pockets don't produce enough steam to make a blister, or bubble, on the cheese surface.

White, opaque color. Smaller and more numerous fat globules reflect more light, giving the pizza cheese an extremely white appearance. We think it is the whiter appearance that influenced

the taste panel—some of them commented that it looked like there was more cheese on the pizza.

No browning. Due to the starter culture used and the altered manufacturing protocol, the pizza cheese has no residual sugar and will not brown during baking.

The Wisconsin Center for Dairy Research's pizza cheese technology offers several advantages for the cheesemaker. Because no mixer molder or brine system is needed, manufacturers of stirred curd cheeses (Cheddar, Colby, Muenster, or Brick) can produce a cheese for pizza. Since brining can produce a salt gradient within the cheese which then influences cheese properties, this new technology produces cheese that is more homogeneous. Bypassing the mixer step results in less fat loss, therefore fat recovery increases from about 86 to 91%, giving cheese manufacturers higher cheese yields.

CDR's pizza cheese is a result of applying technical experience and knowledge gained from basic research to a particular project. It is a good example of the type of problem solving that CDR's Cheese Applications program was set up to do. If you have any questions about the Cheese Applications program, or the pizza cheese, contact Amy Dikkeboom at CDR, or Carol Chen after September 1, 1997. 

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did allow us to simply test the water to assure a residual chlorine level (around 2.0 PPM, normally 0.2 PPM) and daily safe water samples were tested. In our case, right in our own laboratory. So, when the water came on, we spent about three hours wet cleaning, and then started taking milk back in. We made starter on Friday and cheese on Saturday.

Looking back, we actually started up our cheese plant quite rapidly, due to minimal damage and, basically, the strong desire by employees to get back to normal as soon as we could.

Evaluating product to save was the next phase of the recovery plan. One million lb. of cheese in 640 barrels was found to be between 50° and 60°F in our precooler. Because this cheese was

over 50°F, we sampled it and tested for Salmonella, Listeria and checked the pH. All tests were okay, and this product was sold for unlimited use. About twelve million lb. of cheese, which never got above 50°F and suffered no obvious ill effects, was judged to be okay, too. Two million pounds of dried whey products onsite were fine. It helped, again, that the fumes from the propane fire were not considered toxic.

Wisconsin Central Railroad had their own mess to clean up. I really felt for them and it certainly helped everyone's disposition that the railroad promised to cover all expenses caused by the wreck. The total cost of the entire accident, by the way, to the railroad and their insurance carriers will be somewhere in excess of 35 million dollars. 

Cheese What Makes it a Perfect?

From Maine, from Texas, from North Dakota and New York—pizza makers converged on Las Vegas for Pizza Expo 97. Featured seminars covered the basics—cheese, ingredients, sauce, and crust, to the esoteric—seafood pizza, vegetarian pizza and dessert pizza. (The latter seminars presented by WMMB.)

CDR was represented at Pizza Expo, too. Amy Dikkeboom, cheese research specialist, and I went to Pizza Expo to talk cheese with the pizza makers. While working with pizza cheese, CDR researchers realized they needed a better idea of what pizza makers wanted in pizza cheese. What characteristics would top the list for the ideal pizza cheese?

Here is what we learned in an entirely nonscientific survey of pizza makers (generally collected by collaring anyone who would talk to us). We found that pizza makers preferred a white cheese that has flavor, good stretch and melts evenly. They told us that toppings influenced the pizza baketime, hamburger and onions were the worst. One person noted that pepperoni seemed to make pizza cheese brown quicker.

Consistency, Uniformity

It was actually a food supplier who mentioned this characteristic, they specifically requested consistency from day 7 to day 35. A related request—less variation in functional characteristics.

Type of cheese

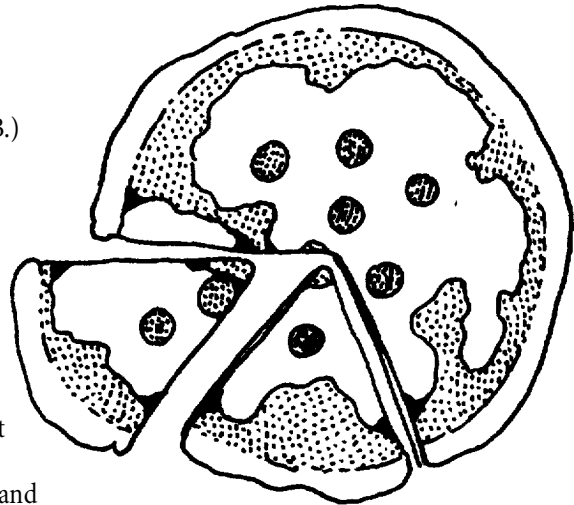
The people we talked to used a variety of cheeses on their pizza. Some of them had tried reduced fat cheese, but they felt that customers are not interested. Several reported getting complaints from customers when they used reduced fat cheese. Pizza eaters are not concerned with the fat content, they are out for a treat and much more interested in traditional pizza with cheese that has some flavor.

Most used some type of blend, for example one pizza maker used a blend of 80% Mozzarella, 10% Provolone, and 10% Cheddar. They noted variation, sometimes their blend browned quicker, which was a problem for them.

We talked with one pizza maker who tried sliced Provolone on pizza. He thought the cheese melted great and looked great, but it the flavor wasn't appealing. He also noted that he liked the shiny look of Mozzarella and was planning to go back to it because he just felt that he was offering his customers a better quality product.

Many pizza makers tried varied types of pizza as specials, either weekly or monthly. They felt that both Feta cheese and Ricotta cheese seemed to be getting more popular. A Texas pizzamaker told us that his customers didn't really care for "southwest style" pizza, in fact it was only the tourists from places like Wisconsin who ordered it!

The most surprising pizza cheese story we heard came from two couples who have pizza parlors in Wells, Maine and Brockton, Massachusetts. They use only 90 day old Wisconsin Cheddar on their pizza. They told us that 50 years ago, in Brockton, Mass., the Greeks used Cheddar cheese on pizza and the Italians used Mozzarella. They started with Cheddar cheese at Tip Top Pizza and they have stayed with it. In



their town, people expect pizza cheese to have flavor. In fact, some kids in Brockton won't even eat the pizza from popular chains because "the cheese tastes funny." These dedicated Cheddarheads proudly noted that anyone who likes cold pizza will find that Cheddar cheese pizza tastes very good cold.

Form of cheese

Block and frozen diced cheese seemed the most popular forms of pizza cheese purchased by our sample of pizza makers. Many noted that portion control was very important. One pizza maker brought this point home by sharing some kitchen stories. Several of his employees are teenagers, who seem to think that the more cheese on the pizza the better the pizza. His mother ordered a pizza from his store and complained that "there was so much cheese she could hardly eat it." This same pizza parlor is currently paying workers' compensation to a teen aged employee who stuck a finger into the equipment to clear the shredder. (She didn't lose the whole finger, but she hasn't worked for a while.) Makes you wonder if one portion packaging might save some money for pizza makers, even though it costs more up front.

Overall, pizza makers seem to prefer the traditional approach — high quality Mozzarella (LMPS) cheese for pizza. However, they are successfully experimenting with blends of cheeses and some nontraditional pizza cheeses, too. ☺

Keeping Competitive— It's also about Service

by Tera Johnson
UW Madison School of Business

Successful businesses in the 90's do more than just make great products. They also deliver exceptional customer service. Thus, recent results from a survey of retail, food service, and ingredient cheese users throughout the country shouldn't be a surprise. This survey showed that customer service was a very important factor influencing choice of supplier (FRC Research Corporation, 1996). Faced with an array of suppliers of comparable quality products, "Easy to work with," "Willing to solve problems when they came up," and "Always delivered the product on time," were likely attributes of chosen suppliers. Users also identified the manufacturer by name, not the middlemen, when they discussed their suppliers.

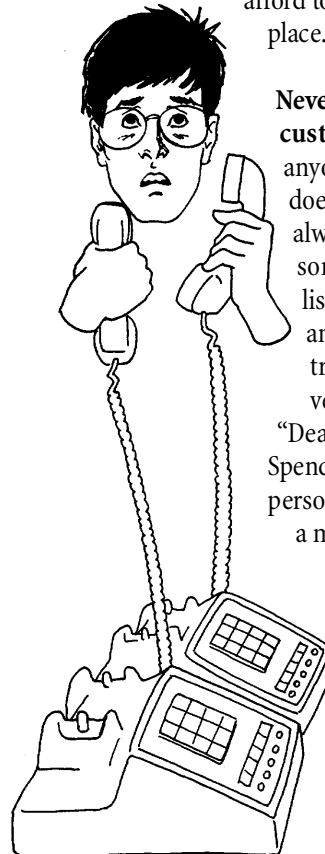
What do these findings mean for your business? They mean that your ability to deliver quality customer service is critical to your business success, regardless of what you sell to whom. The following tips may help you start thinking about the ways you can improve your customer service.

Become a customer feedback devotee. **Encourage your customers to complain to you.** (Yes, I did write that.) Every customer complaint is an opportunity for you to improve your business practices. Remember, every customer who doesn't complain but goes somewhere else, tells their colleagues, friends, and family members why they did.

Make sure your customers can reach someone quickly when a problem arises. Does your phone share a line with a FAX machine or modem? Does your answering machine mysteriously fail to take messages? Are employees using the same phone line as customers? Now is the time to make sure that telecommunications technology is supporting your business. Deregulation has brought many relatively inexpensive options for small businesses to take advantage of to improve customer service, even in rural areas. For a minimal per month additional charge, you can now install additional phone lines, use reliable off-site voice mail, or activate call forwarding, to name a few customer friendly options. (Another money saving tip: if you're using the same local and long distance carrier you always have, now is the time to get competitive bids. Phone service resellers can save you hundreds, even thousands of dollars a year, depending on the volume of phone traffic you have).

ACT on every customer complaint and TELL your customer afterward what you did. Solving problems and keeping the customer informed can turn a potential disaster into a devoted customer. Everyone knows problems will arise in any business relationship. Evidence that problems will be handled is very reassuring to customers.

Remember your brokers, converters, & distributors represent you in the eyes of your customer. Be explicit with them about your customer service expectations, and about what the consequences will be if those expectations are not met. You can't afford to be misrepresented in the market place.



Never lose your temper with a customer on the phone. This goes for anyone dealing with customers. It doesn't mean that the customer is always right, but it does mean that someone in your company has to listen. Often, that's all they wanted anyway. Relatively inexpensive training seminars are offered by vendors like SkillPath on things like "Dealing with Angry Customers." Spending \$65.00 now to train the person answering your phone may keep a major customer later.

Always return phone calls. There is nothing quite as disturbing to a customer as calling into the proverbial black hole. Remember, they took time out of their busy schedule to call you. You need to do the same.

Be proactive. Analyze your business processes from the point of view of your customer. Have your mother fill out your order forms. Is your billing process confusing for customers? Do mail-order customers have to fill out confusing shipping charges? If customers need help filling out their paperwork, do they have a phone number to call? Is your written documentation up to date? The goal is to become "Easy to Work With."

Don't surprise your customer with bad news if you don't have to. Bad news doesn't get better with age. If you know you are not going to be able to fill an order at the end of the week, for whatever reason, let your customer know ahead of time and explain why. Strive to preserve the long-term relationship at all costs, even if it means sending your customer to another supplier in the short run.

Keep track of every instance when you couldn't fill an order on time. Analyze what happened and to whom. Are there any

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News from CDR

Leaving ...

Professor Norman F. Olson, Wisconsin Distinguished Professor of Dairy Technology is retiring from the faculty of the Department of Food Science in June, 1997. Of course, he will still be involved in the dairy science world since he is the senior editor of the Journal of Dairy Science. Here at Babcock Hall, we know that Norm's humor, wisdom and knowledge can't be replaced. We are just hoping he hangs out the Emeritus Professor sign and comes into his office occasionally. If you want to be part of the retirement festivities (tentatively planned for September), call Dr. von Elbe in the Food Science Department at (608) 263-2008.

Dave Bogenrief, long time CDR cheese researcher, has left to pursue a new career in physical therapy. We miss him and we are really glad he's still on campus and stops by to visit. Good luck, Dave!



Gulhan Yuksel, and Qiaoling Zeng, the first recipients of the Norm Olson Scholarship, awarded by Wisconsin Cheese Makers Association on April 3, 1997 in Green Bay, Wisconsin.



Food Expo

If you are going to the WorldWide Food Expo in Chicago, stop by CDR's booth. (#413) This show, the largest food, dairy and beverage trade show in the Western Hemisphere, is expected to attract 30,000 attendees.


Researcher Directory

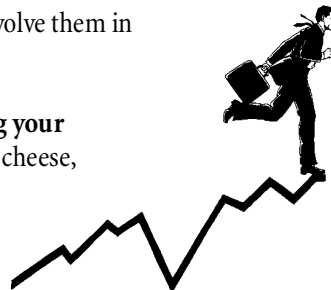
We have just updated the University of Wisconsin Dairy Foods Researcher Directory. If you would like a copy, call Jean West at (608) 265-2133).

Keeping Competitive

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patterns? If so, what is the underlying problem? If your customer is part of the problem (i.e., they always call in their order late then wonder why it's not delivered on time), involve them in solving the problem.

Most importantly, define your job as helping your customers solve their problems. Yes, you sell cheese, and so does every other cheesemaker in Wisconsin, the U.S. and abroad. What will really set you apart from your competition is your ability to identify, even anticipate, customer problems and provide value-added solutions. 



References

FRC Research Corporation, "Cheese Channel Buyers' Needs Study," 1996. Data available through Wisconsin Milk Marketing Board (WMMB), contact Margaret Welke at (608) 836-8820.


Curd Clinic

Q. At the recent Wisconsin Cheese Industry Conference, Dr. Eric Johnson reported that *Listeria* in the brine was not affected by membrane filtration. I thought that the function of the membrane filtration systems was to take care of those pathogens.

A. Dr. Johnson's study was carried out to determine the survival of *Listeria monocytogenes* in commercial and lab-prepared cheese brines. In their study, they added *L. monocytogenes* to brines at low levels, after filtration, to determine how long they would survive in the brines. When Dr. Johnson reported that *Listeria* survived in the filtered brine as well as in unfiltered brines, he was indicating that the filtration process did not remove any critical contaminants or food materials that affected the survival of *Listeria*.

The principle of the membrane filtration process (nanofiltration, diafiltration, etc.) is to physically remove the contaminating bacteria from the brine solution. The membrane pore size is small enough to restrict the passage of bacteria and particulates, while allowing the brine solution to pass through.

As Dr. Johnson pointed out, if *Listeria* is a contaminant introduced to the brine after filtration, it will survive just as well as it does in unfiltered brines. The only way to eliminate contaminants is to routinely filter the brine solution. If you are batch-filtering brine from a small tank, it may be relatively easy to maintain brines free of pathogens. However, in larger brine systems, filtration is continuous. This continuous system is an attempt to effectively filter all the brine over a period of time, but there is no definite point where we can show that all the brine has been filtered.

To effectively maintain brine quality in continuous systems, membrane filter suppliers typically recommend that the volume of brine solution be turned over every two days. With proper operation of membrane filter systems, microbial counts on brine solutions should be less than 100/ml. for standard plate count and less than 10/ml. for yeast and molds. The filtration process will remove over 98% of the bacterial contaminants. This should greatly reduce the risk of pathogens in brine, but there is no guarantee that pathogens will not be present. Thus, you must always ensure that you are introducing good quality cheese into the brine systems and that brine maintenance procedures are in place to effectively reduce or eliminate potential microbial contaminants. 

Curd Clinic Doctor for this issue is Dr. Bill Wendorff, Associate Professor, Dept. of Food Science (608) 263-2015 wlwendor@facstaff.wisc.edu



Questions for the Curd Clinic?

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June 22-25 American Dairy Science Association Annual Meeting, sponsored by American Dairy Science Assn. Guelph, Ont., Canada. For more information call ADSA, (217) 356-3182.

July 17 Wisconsin Dairy Products Association Annual Butter and Cheese Grading Clinic. Wisconsin Dells, WI. For information call WDPA, (608) 836-3336.

Aug. 18-21 Milk Pasteurization and Process Control School. Madison, WI. Call Bob Bradley at (608) 263-2007 for information, or the CALS Conference Office (608) 263-1672 to register.

Sept. 3-5 Producing Safe Dairy Foods. Madison, WI. Call Mary Thompson (608) 262-2217 for more details.

Sept. 25-26 Dairy, Food and Environmental Health Symposium. cosponsored by Wisconsin Association of Milk and Food Sanitarians, WI Association of Dairy Plant Field Reps, and WI Environmental Health Assn., Wisconsin Dells, WI. For more information, call Bill Wendorff at (608) 263-2015.

Oct. 6-10 Wisconsin Cheese Technology Short Course. Madison, WI. Call Bill Wendorff at (608) 263-2015.

Oct. 15-16 North Central Cheese Industries Assn. Annual Convention. Minneapolis, MN. For information, call Sybil Woutat at (612) 624-1764.

Oct. 21-23 Milkfat as an Ingredient Short Course. Madison, WI. Call Kerry Kaylegian at (608) 265-3086.

Nov. 12-13 Wisconsin Cheese Grading Short Course. Madison, WI. Call Bill Wendorff at (608) 263-2015.

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