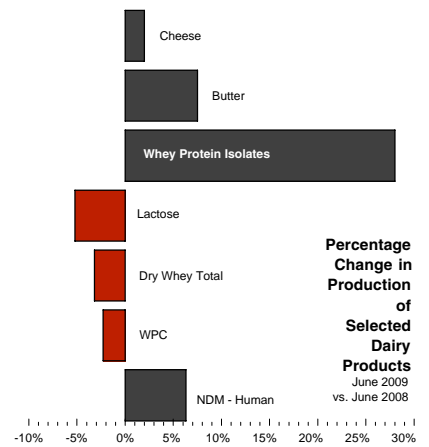




# CHEESE REPORTER

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## Cheese Production Rose 2.0% In June; Output During First Half Of 2009 Topped 5.0 Billion Pounds

Washington—US cheese production during June totaled 832.7 million pounds, up 2.0 percent from June 2008, the US Department of Agriculture (USDA) reported Tuesday.

Cheese production during the first six months of 2009 totaled 5.002 billion pounds, up 1.4 percent from the first six months of 2008 (which had an extra day due to leap year).

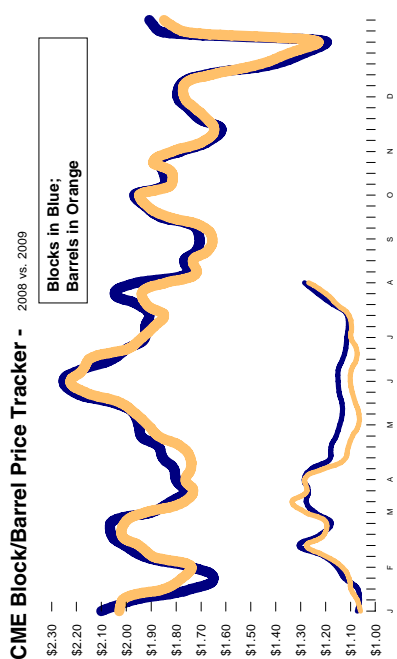
To put that first-half production level in perspective, US cheese production for the entire year didn't top the 5.0 billion pound mark until 1985.

June cheese production in the three regions, with comparisons to June 2008, was as follows: Central, 383.2 million pounds, up 5.4 percent; West, 338.5 million pounds, down 1.3 percent; and Atlantic, 111.0 million pounds, up 1.2 percent.

Cheese production in the leading states during June, with comparisons to June 2008, was as follows: Wisconsin, 216.6 million pounds, up 3.8 percent; California, 165.4 million pounds, down 4.1 percent; Idaho, 66.6 million pounds, up 1.3 percent; New York, 57.6 million pounds, up 5.8 percent; Minnesota, 53.8 million pounds, up 2.9 percent; New Mexico, 49.9 million pounds, up 5.7 percent; Pennsylvania, 34.7 million pounds, down 0.7 percent; South Dakota, 19.7 million pounds, up 11.3 percent; and Iowa, 19.1 million pounds, up 42.7 percent.

American-type cheese production

• See **Cheese Output Up**, p. 6



## CWT's Latest Herd Retirement Round To Eliminate 86,710 Dairy Cows

### Total Of 294 Bids Accepted Out Of 312 Bids Received; More Retirements Possible

Arlington, VA—Cooperatives Working Together (CWT) on Wednesday announced that it has tentatively accepted 294 bids, for 86,710 cows and 1.8 billion pounds of milk, in the third herd retirement round it has conducted in the last nine months.

This eighth herd retirement round in the past six years is also removing 3,104 bred heifers.

This is the third herd retirement round that CWT has conducted in the last nine months. Combined with the previous two rounds, the three rounds combined equal a total production capacity of 4.8 billion pounds of milk being removed since December 2008.

The two most recent herd retirement rounds have been the largest in the program's history; the round completed in July removed a record 101,000 cows and 1.96 billion pounds of milk.

"These two summer 2009 herd retirements, combined with the USDA's recent price support increases, should result in very posi-

tive movement in dairy farmers' milk prices," said Jerry Kozak, president and CEO of National Milk Producers Federation (NMPF), which administers CWT.

For this latest herd retirement round, farmers in 38 states submitted a total of 312 herd retirement bids last month to CWT. This was the first CWT herd retirement round to feature a maximum acceptable bid threshold of \$5.25 per hundred-weight.

This was also the quickest herd retirement following a previous round, which is an indication "that there is still an interest on the part of our members to use CWT to remove more cows, even though the program has been very active in 2008 and to date in 2009," Kozak said.

CWT, Kozak added, "stands ready to conduct yet additional herd retirements later this year in order to help address the severe supply-demand imbalance that has depressed farm-level milk prices. We intend to use all the resources at our disposal to help farmers deal with this severe economic crunch that they're confronting."

Starting next week, CWT field

auditors will begin visiting the 294 farms whose bids were accepted, checking their milk production records, inspecting their herds, and tagging each cow for processing. All farmers will be notified no later than August 31 as to whether their bid was among those accepted.

Once CWT field auditors inspect and accept the herds offered as part of the bidding process, farmers have 15 days in which to send their animals to a processing plant.

CWT will again provide each farmer the NMPF animal handling guidelines for the proper culling and transporting of dairy cattle, Kozak said.

Producers whose bids are accepted in this herd retirement will be paid in two installments: 90 percent of the amount bid times the producer's 12 months of milk production when it is verified that all cows have gone to slaughter; and the remaining 10 percent plus interest at the end of 12 months following the farm audit, if both the producer and his or her dairy facility, whether owned or leased, do not become involved in the commercial production and marketing of milk during that time. r

## Researchers Debate Impact Of Flavor, Food Safety With Sodium Reduction In Cheese

Madison—Cheese manufacturers are struggling with the challenge of putting out a lower-sodium cheese that not only follows food safety standards, but also appeals to consumer taste and flavor preferences.

Not an easy task, according to food researchers debating the specifics of sodium reduction such as salt substitutes and "off flavors," food safety, texture and ultimately, customer acceptability.

The answers are different for different cheeses, and there are some cheeses that are traditionally low in salt, such as Swiss cheese, and a traditional full fat, high moisture Mozzarella, according to Donald McMahon, professor of dairy foods and director of the Western Dairy Center, Logan, UT.

"For cheeses such as Cheddar, cheese salt plays an important role in controlling culture activity during aging so that the preferred flavor compounds are produced, and cheeses that are low in salt (meas-

ured as a percentage of the water content of the cheese) typically do not develop optimum Cheddar cheese flavor," McMahon said.

There's also a role of salt in the actual taste of cheese with consumers expressing a dislike for cheeses that are too low in salt, he said.

Another factor to consider when talking about fat reduction is that the salt levels in cheeses varies extensively and reaching a consensus on what the salt (and hence sodium) levels are in cheeses is difficult, McMahon said.

There are some values in the USDA food composition database, but our observations are that cheeses bought on the retail market can be much greater than these, or much lower, he said.

We have seen low moisture, part skim Mozzarella with salt contents of 2.2 percent, when most cheese

• See **Sodium Impacts**, p. 8

## Sartori's Mike Matucheski Named Wisconsin Grand Master Cheese Maker; State Fair Cheese & Butter Auction Raises \$17,365

West Allis, WI—Mike Matucheski of Sartori Foods, Plymouth, WI, was named the 2009 Grand Master Cheese Maker here Thursday night during the Blue Ribbon Cheese & Butter Auction at Wisconsin State Fair Park.

Matucheski, who competed against 20 other blue-ribbon cheese makers for the title, earned top honors for his Pastoral Blend, which topped the Sheep & Mixed Milk Cheese Class with a score of 99.60.

Each blue-ribbon entry from the

• See **Auction Results**, p. 14

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## Sodium Impacts

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scientists would consider about 1.6 percent to be the norm, McMahon said. And the same for Cheddar cheese with values ranging from similar highs and as little as 1.2 percent, when a norm of 1.7 to 1.8 percent would be expected.

"So of all the cheesemaking parameters this – along with pH – may be the least controlled since unlike fat and moisture content there are no standards of identity for salt content," he continued.

If we split the discussion on the role of salt up into four parts we can find some possible answers, McMahon said.

■ **Influence of salt concentration on flavor development during aging.** Lowering salt levels in cheese will alter the production of flavor compounds in cheese during aging, according to McMahon.

The cultures in cheese respond differently and there is research underway by the Cheese Expert Group from Dairy Management Inc. (DMI) to understand what is happening when manufacturers lower salt concentrations in cheese.

This is being done as part of the research on lowfat cheese because in these cheeses, there is less salt in relation to the amount of moisture in the cheese.

The group has already identified the major off-flavor components that are produced, has developed a method for quantitating them, and is now working on what is happening with the starter cultures and the nonstarter lactic acid bacteria in both model systems and in cheeses.

■ **Influence of salt concentration in cheese on cheese functionality (e.g., texture, melting).** Only low levels of salt – about 0.5 percent –

are needed to get the texture and melting properties of cheese. So that should not be an issue even down to the current low sodium levels required today for labeling that is equivalent to about 0.7 percent salt, McMahon said.

■ **Influence of salt level in cheese on consumer taste and flavor perceptions.** Salt preferences are somewhat linked to foods customarily consumed, but overall there is still a lower level of saltiness where the typical American consumer will begin to dislike the cheese, McMahon said.

**"I do not believe we will be able to reproduce the flavor profile of aged, full flavored cheeses such as Cheddar, Parmesan, or Blue if the salt content was lowered to meet the low sodium requirement of 0.7 percent salt."**

—Mark Johnson, Wisconsin Center for Dairy Research

The group has looked at this with lowfat cheeses and it seems manufacturers can lower salt 20 to 25 percent without too much change, but more than that and cheese makers have issues with consumer preferences.

This level of reduction is basically within the amount of variation that is observed in Cheddar on a regular basis, McMahon said.

"There are still a lot of unknown factors regarding consumer preferences and salt level, such as the application the cheese is being used in, the type of cheese, and the type of

consumer, such as do people who regularly try to control their dietary sodium intake respond to salt levels in cheese the same way as other consumers," he said. "And I would think that before the dairy industry goes down a path of salt reduction in cheese, we really need to understand this area."

■ **Influence of salt concentration on food safety.** If we consider that the preservation and safety of cheese is based on what has been called "hurdle" technology, then salt is only one of the hurdles preventing microbial growth and promoting die-off of unwanted microbes, according to McMahon.

The salt level is insufficient to inhibit microbial growth on its own, but when combined with other "hurdles" that individually are not enough to prevent unwanted growth of spoilage and pathogenic microbes, but together produce the good food safety track record for semi-hard and hard cheeses.

These include slightly acid conditions (pH 4.9 to pH 5.5, with more protection given the lower the pH); cool temperatures (38 to 55 degrees F, depending on the cheese, and even 72 degrees F for Swiss type cheeses for a short period of time (two to four weeks); competition from lactic acid bacteria that grow to high number (up to 1 billion per gram of cheese); depending on the cheese, vacuum-packaging the cheese or using gas-flushing to minimize oxygen levels; and even antimicrobial compounds that may be produced by some of the lactic acid bacteria.

"There are a wide variety of foods today that rely on similar combinations of hurdles to preserve them and prevent transmission of foodborne diseases," McMahon said.

• See **Sodium Impacts**, p. 10

## NYC's Sodium Reduction Initiative Asks Cheese Makers To Reduce Salt Levels From 15% To 25%

Washington—The New York City Department of Health and Mental Hygiene held a meeting late last month to discuss its proposal for food manufacturers to reduce sodium in dairy foods – specifically cheese – on a voluntary basis. The city's effort is modeled on a voluntary salt reduction campaign in the United Kingdom.

Working with other local and state governments and public health organizations, the department has formed the New York City National Sodium Reduction Initiative with a goal of reducing the amount of sodium in the diet by 20 percent by 2014.

The department's proposal asks dairy manufacturers to reduce sodium in cheese from 15 percent to 25 percent, depending on the type of cheese, in the next five years. Processed cheese manufacturers would be expected to make the most cuts in sodium, with a 10 percent reduction by 2012 and an additional 15 percent by 2014.

The proposal also calls for significant sodium reduction in cottage cheese, with a 10 percent reduction by 2012 and an additional 10 percent cut by 2014. Makers of others types of cheese, including hard-grated cheese, natural cheese and cream cheese, would be asked to reduce sodium content 5 percent by 2012 and an additional 10 percent by 2014.

"The potential impact on cheeses is huge due to the importance of salt and sodium in the cheesemaking process, so IDFA is closely monitoring this initiative," said Michelle Matto, IDFA assistant director for nutrition and labeling.

"Instead of a blanket reduction of sodium levels in specific foods, IDFA encourages balancing sodium intake in the overall diet," she continued.

While the United Kingdom may be ahead of the US in its dietary recommendations regarding sodium reduction, the US may be ahead of the rest of Europe concerning sodium, said David McCoy, director of product applications, Dairy Management, Inc.

The average American's recommended daily intake of sodium is currently 2,300 milligrams. According to DMI's Raj Narasimmon, the typical intake is more like 3,400 milligrams of sodium.

IDFA plans to work with members of the Ad Hoc Working Group on Nutrition and the NCI Regulatory Committee to submit written comments to New York City. Those interested in participating should contact Matto at [mmatto@idfa.org](mailto:mmatto@idfa.org) or (202) 220-3523. r

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## Sodium Impacts

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Typically, if one hurdle is lowered then another can be increased to maintain the same level of food safety protection, he said. We know little about what combinations would be effective for salt reduced cheeses.

For example, can you reach the same level of protection in a salt-reduced cheese if Cheddar is stored at 38 degrees F rather than at 42, 46 or 50 degrees F, which are commonly used to accelerate the cheese maturation process?

For process cheese products, salt is an essential factor in ensuring safety, according to Kathleen Glass, associate director and associate scientist, Food Research Institute (FRI).

"Shelf-stable process cheese spreads are hot-filled and stored at room temperature; their safety is dependent on using the right combination of salt, moisture and pH to prevent growth of Clostridium botulinum during extended storage," she said.

"Similarly, salt can reduce the available water in process cheese slices and food, and reduce the likelihood that pathogens such as Listeria will grow when refrigerated," Glass continued.

Three of the major factors for safety of all foods are moisture, pH

(acid) and salt, Glass said. If salt is reduced, either the moisture must be reduced or acid must be increased.

"Both will affect flavor and quality of the cheese," she said. "Another option for foods in general is to add a traditional or 'natural' preservative. There are organic acid salts such as potassium lactate or sodium diacetate, nisin, and others. Unfortunately, most of these ingredients are not allowed in natural cheeses."

Another means to protect cheese is to keep the products strictly refrigerated at less than 39 degrees F to prevent most microbes from growing, Glass continued.

### Biggest Challenge Could Be Flavor Development, Taste Acceptance

It may turn out that our biggest challenge is with flavor development and taste perceptions and acceptance, according to McMahon.

Swiss cheese has a salt level of about 0.5 percent, yet even for Swiss cheese made from unpasteurized milk it is still considered safe if it is aged for 60 days. This includes about three weeks at 70 degrees F, and the remainder of the time at about 40 degrees F.

"So if this can be used as a model for other cheeses, then reducing the salt content should not be a food safety issue," he said.

"It's also interesting as a side note that consumer preference for Swiss

cheeses is rather bimodal with the population dividing into two separate groups – those that like the flavor of Swiss cheese and those that don't," McMahon said.

"I don't have any data on the cause of this, but my cause would be that it's strongly related to the lack of saltiness, and the flavors that develop in such a low salt environment," he continued.

Mark Johnson, senior scientist with the Wisconsin Center for Dairy Research, said most low-sodium cheeses are made to have less lactic acid in them, and that's the real safety issue."

While sodium chloride has received the bulk of attention regarding safety, a more important issue is the level of acids in the cheese, Johnson said.

Salt is used to stop or slow acid development by the starter culture. Without salt the pH of Cheddar and other non-washed (or rinsed cheeses) would drop to below 4.9 – very acid-tasting cheese, he said.

With the advent of faster, more salt-resistant cultures, the industry has increased the salt content of some cheeses – namely Cheddar – two or more decades ago from roughly 1.5 percent to 1.8 percent.

"To prevent a low-salt cheese from becoming too acid, the curd is washed or rinsed (or water is added to the whey and curd mixture). As a result, the acid content will be greatly reduced but the cheese is more vulnerable to growth of undesirable bacteria including pathogens if contaminated post manufacture," Johnson said.

There may have to be a new regulation pertaining to low sodium cheese, he continued. He would think that it would have to be made from pasteurized milk.

• See **Sodium Impacts**, p. 19

## 2010 Dietary Guidelines & Sodium Reduction: Cutting Salt Without Cutting Cheese

**Madison**—Starting next year, US consumers may be urged to cut even more sodium from their diets, forcing some to give up cheese out of fear of salt overload.

The debate now with the upcoming 2010 Dietary Guidelines is whether the recommendation should remain at 2,300 milligrams or some factions that argue the number should be lowered to 1,500 milligrams, said Raj Narasimmon, vice president of product research, Dairy Management, Inc. (DMI).

If lower recommendations are approved, the industry will respond to the market, Narasimmon continued. If there's a market for lower sodium products, manufacturers will make them available to customers.

The gold standard for diet is the guidelines Harvard University and the American Institute of Food put together over a decade ago, says Edible Solutions' Dan Strongin.

- Eat a variety of foods, and balance your diet over a few days – not meal per meal.

"In other words, if you eat some hard cheese – which has higher concentrations of salt – cut back on salt elsewhere," Strongin said. "Maybe grate the cheese over your food in place of salt, lowering your salt intake and gaining more nutrients to boot."

- Eat no more calories than you expend in physical energy, or your body will make fat no matter what the source. And since you will be limiting calories, eat more nutrient-dense calories like cheese, Strongin said. More bang for the buck.

"Diet is an extremely complex thing and defies simplistic solutions," Strongin said. "Playing around with the food we eat to meet with people's media-driven fears is very dangerous."

People cut out dairy at the risk of not enough calcium; they cut butter for margarine, only to find out that it's filled with trans fat, Strongin said.

"Funny thing is that those who practice the age-old team of moderation and traditional diet – like the Mediterranean diet – actually consume more fat than us in the US and are not restricted in salt intake," he said.

They balance their diet over time and eat minimally processed foods, Strongin said.

The number one cheese in Greece for both consumption and fat content is Feta – brined in water or whey and salt.

Yet according to research, those who eat the traditional diet in Greece suffer from 10 times lower cancer rates and a third less risk for coronary disease, Strongin said.

"Go figure," he continued. r



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## Sodium Impacts

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When looking at the market, there are a lot of reduced fat cheeses but very few reduced sodium varieties, said Raj Narasimmon, DMI's vice president of product research.

"First, consumers are very sensitive to taste. If you cut sodium back by 20 percent or so, they taste the difference," Narasimmon said.

"Consumers also seem to be more concerned with calories and fat rather than sodium," he said. "I've talked to cheese manufacturers who say they've tried to introduce new products but the products have failed because lack of consumer interest."

**"There are still a lot of unknown factors regarding consumer preferences and salt level...I would think that before the dairy industry goes down a path of salt reduction in cheese, we really need to understand this area."**

—Donald McMahon,  
Western Dairy Center

Food scientists have been working on salt substitutions for some time. Essentially, when manufacturers add elements like potassium chloride, the result is a cheese with "off" flavor, according to Narasimmon.

When you use substitutions either in natural or processed cheeses, you won't get the same natural flavor, he said.

### 'Significant' Sodium Reduction?

By definition, the label "low sodium" means over 80 percent reduction in sodium of the sodium content of in Cheddar cheese, according to Nana Farkye, professor with the Dairy Products Technology Center at Cal Poly State University.

Organic Valley/CROPP Cooperative, La Farge, WI, has been marketing reduced sodium Cheddar for over 16 years. The cheese has now become its sixth best-selling style.

OV reduced the sodium content by 25 percent, strictly by reducing the amount of salt used in production, says Louise Hemstead, chief operating officer and president of organic logistics, CROPP Cooperative.

"The timeline to create the product was relatively short – about six months," Hemstead said. "Of course, over the years we have had some successes with minor product improvements."

"We have not and do not utilize any salt substitutes in our formula," she continued. "Of course, as you remove salt from a formula, you increase your water activity and it's very important to be sure to have tight GMP's in your production facility."

Organic consumers are very aware of issues regarding sodium content in their foods and they read labels, said OV vice president of sales Eric Newman.

"The demographic is older Baby Boomers who are moderating their sodium intake due to the associated risks of hypertension, high blood pressure, heart disease and arteriosclerosis," Newman said.

We have solid, steady growth for reduced-sodium cheese in the vicinity of 10 percent year after year for the past decade, he continued.

### Can Industry Create A Low Sodium Cheese Consumers Actually Like?

Many reports suggest that salty taste is an acquired taste – the question is, will consumers get used to a low sodium cheese?

The answer is yes, according to Farkye, but it will depend on the presence of other desirable and associated flavors, and absence of undesirable flavors like bitterness.

Other than the so-called preservative effect, most of the cheese consumed in the US is used in foodservice as an ingredient in other prepared foods, Farkye said.

"Therefore, with proper control of

manufacturing technologies – including starter selection – and finished cheese parameters as well as aging and packaging, the cheese industry can produce ingredient cheeses with less salt that will perform well in their intended use," he said.

"The bigger challenge is with quality low sodium table cheese, which needs more research and consumer education," Farkye continued.

"As far as the impact on flavor of low fat cheese, I somewhat disagree with Nana," Mark Johnson said.

"I do not believe we will be able to reproduce the flavor profile of aged, full flavored cheeses such as Cheddar, Parmesan, or Blue if the salt content was lowered to meet the low sodium requirement of 0.7 percent salt," he said.

Salt (water activity) does influence flavor development in a positive manner, Johnson said. Can a low sodium cheese – mild in flavor yet devoid of flavor defects be developed? Yes, Johnson said, but it will not be the typical aged full flavored cheese many cheese lovers prefer.

"The industry is currently and steadily lowering the salt content of some cheeses to condition the consumer to lower salt cheese," Johnson said. "This can be done to a point before cheese quality will suffer." r

## CDRF Seeks Nominations For 6th William C. Haines Dairy Science Award

Davis, CA—The California Dairy Research Foundation (CDRF) is accepting nominations, through September 22, for the 6th annual William C. Haines Dairy Science Award, honoring individual scientists who work in support of dairy science.

The award is open to US and international scientists who have made a significant contribution to dairy science and the betterment of the dairy industry through research and development in the field of chemistry, biochemistry, microbiology, technology, nutrition, and/or engineering and includes a plaque, a cash prize of \$1,000, travel expenses and the opportunity to make a presentation at a dairy industry event co-sponsored by the CDRF.

Nomination forms for the 2009 award available at [www.cdrf.org](http://www.cdrf.org) under "Awards/Giving." The winner will be announced in March 2010.

Established in 2004, the William C. Haines Dairy Science Award is named for Bill Haines, the former vice president of product innovation for Dairy Management, Inc., in recognition for his contribution to and support of the field of dairy science. r



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