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## The Changing Face of the Perfect Food

*Dairy products are evolving to more than just the traditional milk, butter and cheese. What is coming, and how will that change the dairy landscape*

By Christy Couch Lee

*At one point in the not-too-distant past, the U.S. dairy industry was known simply for its production of high-quality milk — plus the traditional butter and cheese.*

*But, oh, how that's changed.*

*Sure, the quality of our nation's milk supply is still incredible. But the offering of innovative products beyond that staple? It's never been more promising.*

*The U.S. dairy industry is poised to provide a variety of products to meet the needs of an ever-changing consumer. All it will take? A bit of hard work and leading-edge research from the farm to the plant — and beyond.*

*John Lucey, food science professor and director of the Wisconsin Center for Dairy Research (CDR), University of Wisconsin-Madison, grew up on a small dairy farm in Ireland and earned his bachelor's degree and Ph.D. in food science, focusing on dairy products and chemistry.*



*John Lucey, food science professor and director of the Wisconsin Center for Dairy Research, University of Wisconsin-Madison, says specialty cheeses are one of the many bright spots for the U.S. dairy product industry.*

Today, he oversees the CDR, which provides training for dairy industry professionals across the U.S. and assists dairy companies with cutting-edge product development and technical support.

“Going back over the past 30 years, one of our guiding philosophies has been to encourage dairy plants, especially small to medium plants, to try something new — value-added or specialty products — so they can make more of a return from their products,” Lucey says. As a matter of fact, a focus on innovation has always been the key to success in the dairy industry.

### THE EVOLUTION OF PRODUCTS.

Before World War II, U.S. dairy producers primarily provided milk, butter and cheddar cheese to consumers. But the war brought growth in mozzarella production.

“There was massive growth in pizza in the second half of the century, with the return of soldiers from Italy, as well as more Italian immigrants. Pizza continues to be an important category of food in the U.S. for its convenience,” Lucey says. “Mozzarella started as a specialty cheese, and grew to become one of the top cheese varieties.”

Through the 1970s and '80s, Lucey says, the U.S. cheese offerings primarily consisted of American-type cheddar, mozzarella and cottage cheese, with an introduction of muenster and provolone in some areas.

The 1970s also brought an introduction of yogurt in the U.S., and its growth has been phenomenal.

“Yogurt was almost unheard of here until the 1970s,” Lucey says. “And the introduction of Greek yogurt in the past six or seven years has greatly increased consumption. Demand has grown, but our per capita consumption of yogurt has a long way to go, in comparison to Europe.”

The introduction of whey protein products in the '80s also changed the landscape for dairy products, he says.

“In infant formula, for weightlifters and athletes, in sports bars and drinks, dried whey powder products are a multi-billion-dollar global industry,” Lucey says. “It's also become a significant export product, with about 64% of whey proteins being exported around the world.”

The U.S. cheese industry also is garnering respect for its quality by winning more international awards than any other country, Lucey says.

“The U.S. has seen a great influx of people and companies bringing investments and innovative ideas,” he says. “I see a bright future.”

Currently, American cheese makers only export about 6% of their products, as compared to more than 50% of skim milk powder being exported. But the goals for each are different.

Lucey says, until recently, the U.S. has imported much of its specialty cheese needs.

“However, we are continually replacing imports with fine-quality cheese produced right here in the U.S.,” he says. “And it's not just me saying this; the world is saying it. U.S. cheese makers are producing fantastic cheeses. Right now, it's not so much about exporting as it is about replacing imports. And we are doing a tremendous job of that.”

And incredible cheese isn't the only bright spot on the U.S. dairy product horizon.

### FOCUSED ON THE FUTURE.

In the past few years, ultrafiltered milk has been big news.

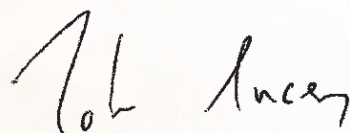
“Ultrafiltration is a gentle process that's been around for many years,” he says. “It uses no chemicals. This process is providing choice for consumers

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**Dr. John Lucey**  
**Wisconsin Center for Dairy Research**

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## REAL FACES of DAIRY



### REAL FACES OF DAIRY

The *Real Faces of Dairy* campaign is a year-long project designed to honor and celebrate the past, present and future people—well known and lesser known—shaping the American dairy industry through their personal stories. It provides a forum to highlight the many advancements creating an exciting and vibrant industry serving a global market.



#realfacesofdairy

### SHARE YOUR STORY

Throughout 2016, the *Real Faces of Dairy* project encourages everyone to share their dairy story and upload pictures of what dairy means to them. The dedicated website features interactive activities, including photo and essay contests. Visit [www.realfacesofdairy.com](http://www.realfacesofdairy.com).

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with higher protein, more calcium and less sugar. I believe we will see this as a major category in a couple of years.”

Ultrafiltration also can allow lactose to be reduced, or coupled with technologies for it to be removed. With lactose intolerance being a factor for some consumers, this processing option is promising for the U.S. dairy industry.

“Alternatives are out there, and they’re growing in popularity,” Lucey says. “We are looking at milk protein allergies, and are finding novel ways to improve the digestibility for some people with allergies.”

Lucey says innovations in lower-fat and lower-sodium cheese products are coming because of consumer demand and interest from companies, as well as their potential role in school lunch programs.

Researchers also are working to develop longer shelf life for U.S. cheeses so that they can be more readily exported, Lucey says.

“The distances — as well as the time in shipment, customs clearance, and distribution — are huge,” he says. “The shelf life of U.S. cheese needs to be increased dramatically in order to reach more markets with a high-quality product.”

From an ingredient standpoint, Lucey says, new processing options like microfiltration are on the horizon.

“Microfiltration is a new process to help separate milk into its components for specific needs,” he explains. “Like in crude oil, it’s broken into many parts, and all of those parts are more valuable than the whole. We are working to break apart milk in much the same way, separating the components into individual caseins and other components for specific needs.”

For example, which proteins would work best in protein bars, in order to lengthen shelf life and palatability? And how can the foaming properties of beta caseins be used in whipped products, to replace chemical emulsifiers?

The possibilities are exciting, Lucey says.

### BRINGING IT BACK TO THE FARM.

Although it can seem that these product developments happen far from the farm, each U.S. dairy producer plays a big part in the success of these new products.

## Why milk?

Milk and milk products are a perfect protein source for humans because milk is designed by nature for the nutrition of mammals, says John Lucey, food science professor and director of the Wisconsin Center for Dairy Research, University of Wisconsin-Madison.

“There’s a lot of competition for milk and milk products, but milk has one sole purpose,” he says. “It has the amazing advantage of having all of the nutrients needed to sustain and grow people.

“Milk is developed by the cow to provide every vitamin, amino acid and nutritional component a young animal needs, Lucey says.

“Products created from plants or other sources were never designed to sustain a young calf or infant,” he says. “Very often, before we can consume plant protein, it must go through a process to remove various components in order for it to become digestible. It’s simply not designed for human consumption in its native state.

“The proteins found in milk are also key to the next generation of dairy products and ingredients.

“Over the past 20 years, we’ve also come to realize the amazing proteins present in milk,” Lucey says. “Sure, we see people buying milk products for the incredible taste, as in ice cream. But we also see people buying dairy

products for the nutrition, as in infant formula or sports drinks.

“The branched chain amino acids found in dairy products are the highest natural source of these amino acids found in any type of protein, Lucey says, and these branched chain amino acids are excellent at providing muscle recovery and development.

“It’s not the cheapest source of protein, but in terms of quality, it’s hard to beat dairy proteins,” he says. “Also, the versatility of dairy proteins is amazing. They can be found in baked goods, meat products and sports drinks. It’s incredible the products they end up in, without contributing negative flavors.”

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Most importantly, Lucey says, U.S. dairy producers should remember the importance of protein.

“Different states and co-ops have different incentives, but farmers should understand the importance of protein,” he says. “There’s not much value in water, and most dairy plants spend time removing that water, especially for powders and cheese making. Lactose is also important, but it’s not the most important, in terms of value.” Quality must be at the forefront of everyone’s minds, from the farm to the plant.

“Quality has never been more important,” he continues. “It’s essential, and it should be a driving force, along with getting more protein and fat in the milk.”

A world view is also critical, as more of the U.S. dairy supply, about 14%, is being exported in one form or another, Lucey says.

“As a dairy producer, you are relying on the world market to partly determine the milk price you receive,” he says. “It’s not something to ignore; you must be aware.”

Competitor countries around the world are investing in innovations, from farm sustainability to new processing techniques.

“We need a huge focus on innovation within the U.S. dairy industry” he says. “It will require investments in research, which in turn will provide trained staff to run these plants and create new products. We must invest in the people if we want to get ahead. There’s a lot of opportunity, but a lot of hard work and investments to be made.”

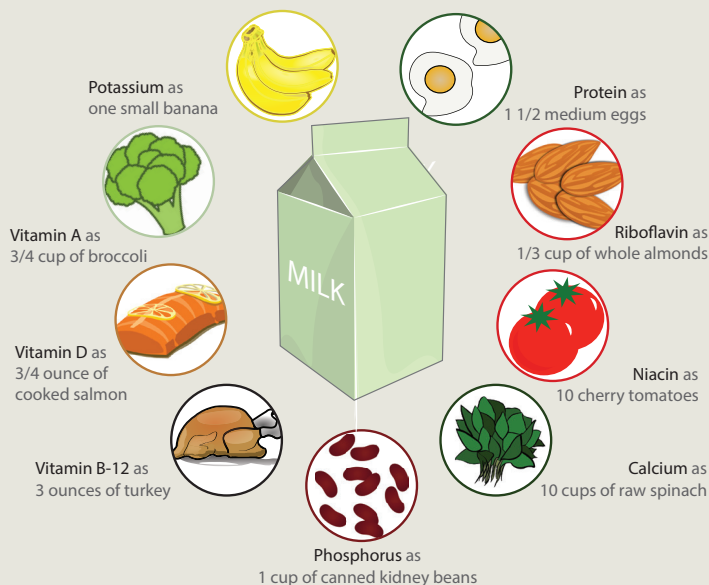
Competition is good. And the U.S. dairy industry is up for the challenge.

“U.S. farmers are fantastic and will adjust, and they’ll be able to produce the highest-quality product of anyone in the world,” he says. “Each individual farmer simply must think about the direction of the industry as a whole, from their own individual farms and situations.

“At the end of the day, we as a dairy industry shouldn’t be afraid of variety and choices,” Lucey continues. “Look at the great nutrition and quality of dairy products. Why not compete?”

Yes, the U.S. dairy industry is poised to provide a variety of products to meet the needs of an ever-changing consumer. And, no doubt, the U.S. dairy farmer is up for the challenge.

### An 8-ounce serving of milk, flavored or not, gives you the same...



#### ABOUT THE AUTHOR

Christy Couch Lee combines a background and passion for agriculture, and has owned Cee Lee Communications, Hoopston, Ill., for six years, specializing in freelance writing and photography in the agricultural industry. You can read more about Christy at [www.realfacesofdairy.com](http://www.realfacesofdairy.com).



View the interview with John Lucey at <http://realfacesofdairy.com/>



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Research across the country is leading to innovative dairy products – products that will lead to increased competitive advantages for the U.S. dairy industry.

#### IN THE NEXT ISSUE:

Dairy in a Changing World. As consumers become more affluent, dairy products and dairy proteins are making their way to the table. Next month, we will follow a Chinese consumer to show how milk and milk protein help her feed her family.