

Mini-symposium on Dairy Products Technology and Future Innovation Opportunities



Dr. Rafael Jimenez addresses the attendees of the Mini-Symposium

On Thursday, October 25th as part of our 25 Year Celebration, the Dairy Products Technology Center (DPTC) held a mini symposium organized by Dr. Rafael Jiménez-Flores on Dairy Products Technology and Future Innovation Opportunities at the Performing Arts Center on the Cal Poly campus. Leaders from leading Universities and Industry provided their insights on the future of the dairy industry.

U.S. Dairy Industry Leaders Give Views of Dairy Products Technology and Future Innovation Opportunities: Long-term Partnership, Leadership, Globalization, and Changing Consumer Needs are Keys.

Cal Poly President Jeffrey D. Armstrong delivered the keynote speech and congratulated the center for “25 successful and innovative

years,” adding, “I know that the next 25 years are going to be even better than the last 25 years because we embrace the idea of continuous improvement as a key aspect of our Learn by Doing approach.”

Armstrong said DPTC has been a key part of Cal Poly’s success over the years, burnishing Cal Poly’s reputation as a “go-to source for resourceful professionals and innovative leaders. As well, the Dairy Products Technology Center has been a leader in embracing problem solving and applied research. “

Armstrong said that a crucial aspect of DPTC’s success has been the center’s industry partners, noting the mutual benefits of the partnership. “Industry partners help fund our programs so that we can continue to produce the industry’s future pool of resourceful professionals and innovative leaders. “

our partners give our students and faculty extraordinary Learn by Doing opportunities. We need those long-term partnerships because they help establish reliability and credibility in our programs and in our ability to produce the future employees that industry needs. And we also need those long-term partnerships so that we can build our bench strength and we can continue to be the best in dairy products and technology. Cal Poly can’t do that without these partnerships. “

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Cal Poly President Jeff Armstrong

skills and technical knowledge.”

Norm Olson, professor emeritus of the University of Wisconsin and Founding Director of the Wisconsin Center for Dairy Research gave a historical perspective of the dairy industry and how far research and education have come, citing the example of whey being considered a valuable ingredient today, rather than an unwanted by-product of dairy foods processing.



University President Jeffrey Armstrong provides the keynote speech.



Norm Olson, professor emeritus of the University of Wisconsin

Olson provided insight on the formation of the National Dairy Research Board and the US Dairy Centers of Excellence. “The existence of a critical mass of researchers in a center or collaborating with centers allowed a greater scope of research and development than was possible in previous initiatives. “

Olson concluded with some tributes. “To dairy farmers who sailed into uncharted waters. To the dairy processors who embraced and applied the output of centers. To the universities who accommodated and facilitated center concepts. And, of course, a special tribute to DPTC for their 25 years of growth and their extensive contributions to the dairy industry.”

Dave Barbano, Professor of Food Science and Director of the Northeast Dairy Foods Research Center, Cornell University shared his perspective of the university’s role both today and in the future. Speaking about the changes and contractions that higher education has seen in this area, he commented, “We cannot do all the things we used to do. The industry has to look at that very seriously in terms of what’s happening and where we are going in the future and that we need to protect, some dairy/food science core resources for the future.”

Downsizing in course offerings and elimination of commodity-oriented courses in food science has been taking place at universities across the country. “Students that have gone into industry who don’t have a foods or dairy background need focused training like that which is going to be offered in Cal Poly’s new MPS program. After earning a bachelors’ degree, students will receive one year of intensive course work focused on dairy.”

He spoke of the future of teaching, research, and extension, and the university’s role in innovating the dairy industry. “Basic and applied research has always been the mission of the land grant universities and this has really been part of the progress for the dairy industry both at the production level and manufacturing level. Many faculty that are doing applied research are doing important work in the pilot plant; they are developing technologies. They may have students working on technologies, but ultimately, if the research results are really going to make any impact, the technology has got to move out to the factories.”

A coordinated and joint effort of industry and trade associations is needed to endow faculty chairs in key dairy center universities in dairy processing focused across all dairy products and dairy ingredients. This will be the most long lasting and beneficial use of industry dollars at this critical point in time for the university and industry.”

David Barbano, Professor, Cornell University, Director, NE Dairy Foods Research Center.



Dave Barbano, Professor, Cornell University

Dr. Barbano gave his view of the role of industry and trade groups, highlighting the need for industry to play an active role on university advisory boards. “The industry needs to recognize that the university dairy faculty are an important part of the future for the dairy industry, the industry needs to support and guide them, and their focus and development for the industry.” He went on to say, “Don’t assume that universities will always have this resource there, it is going away. There are fewer faculty today. A coordinated and joint effort of industry and trade associations is needed to endow faculty chairs in key dairy center universities in dairy processing focused across all dairy products and dairy ingredients. This will be the most long lasting and beneficial use of industry dollars at this critical point in time for the university and industry.”

For the industry perspective, CEO and President of Hilmar Cheese, John Jeter, outlined the innovation needs and the future of the dairy industry in California. He started by giving a little of his personal background and that of Hilmar Cheese. Hilmar’s primary product lines are cheese, whey protein and lactose. They have kept their product lines very basic, but have innovated within those product lines. Most of their protein and lactose business is exported and they are now exporting cheese as well.



CEO and President of Hilmar Cheese, John Jeter

“While over the last 30 years milk production in the US has grown by 50%, in California, it has tripled. What’s ahead?” They have been very domestically focused in the past, but now are looking more globally. “Our market is 7 billion people globally; it will be 9 billion in 2050. The US, in a general sense, has the most incremental, arable land available in the world. This will provide us the opportunity in the future to be able to produce food to help meet the growing global demand. The role of exports will be critical in the future.” Jeter gave some examples of emerging markets that want more dairy, such as recombined dairy drinks and infant formula. He also looked at some areas for new dairy opportunities including products for the aging population such as meal solutions and products for proactive health. “Dairy, in a sense, is the most complete, diverse and nutrient-dense food. It is a very complete food. As processors, we are pulling it apart in different ways and using it in ways that add value.” An example he gave of this was of infant formula. We can take dairy and fractionate it in certain ways that it can begin to mimic human milk. Another area of growth he addressed was that of aging populations. “Higher quality and more diverse proteins out of dairy can help less effective metabolism of aging populations. Dairy is a great place to deliver nutrition and taste as one gets older.”

In terms of academic partnerships, it is so critical that we work together moving forward and understand each other and our skill sets and your skill sets and how we can be more effective together, added Jeter. “We appreciate the abilities that the universities have, Cal Poly in particular, to really expand our knowledge. I know that we work more and more, with your staff here on specific projects to help us meet our customers’ needs.” He loves having students come and do internships; it is one of the tools they use for recruiting future employees, in fact they currently employ 27 Cal Poly grads.

“We appreciate the abilities that the universities have, Cal Poly in particular, to really expand our knowledge”

John Jeter, Chief Executive Officer, Hilmar Cheese Company

He went on to talk about why innovation is so important to Hilmar Cheese Company. Globalization is here to stay. There are big competitors, but opportunities are there, and we need to grow and innovate. Specifically in California with the high feed costs, the pressure is on to not just do basic commodities but to add value. It’s going to become an even more important issue as we go forward. Large buyers need dependable suppliers and ones who can produce on a large scale. Safety systems that we have in the US and California have created demand globally in areas where safety has been a concern.

“What will stop us or impede us as we go forward? We need to generate reform within the industry.” The policies on milk pricing that came out in the 1930’s and that are still in place need to be updated. To really be able to fuel innovation in the industry we need to get away from “margin management” and look to real value creation in the industry. Non asset participants are those who are in the industry but don’t really have a lot of physical assets. The milk price regulatory system allows those non asset participants to stay in the industry and even thrive. The problem is that they come back into the industry and are not very good at value creation through real innovation. We need this to be able to become a world player and be able to compete with countries that have already gone through reform. “It keeps us arguing over a pie that doesn’t change; we need to grow the pie,” concluded Jeter.

The symposium concluded with short presentations and roundtable discussion that included Larry Jensen, CEO of Leprino Foods; Erika Smith, Senior Principal Scientist, General Mills, and Bill Graves, Senior Vice President, Dairy Research Institute (DRI).

Jensen began with a look back at how Leprino Foods emerged from the humble beginnings as a corner grocery store in Denver, Colorado to becoming the world’s largest producer of mozzarella and a world leader in lactose product today.



Larry Jensen, CEO of Leprino Foods

Jensen outlined four core principles for success:

1) have a continuous stream of innovation. Create a never stop learning mentality. Have a healthy dissatisfaction with the status quo.

2) customer collaboration and confidence. What can you do to create demand? How can you help your customers grow? Food safety is really important. "I think that the innovation center has been a fantastic form for ideas and growth. The work that is being done right now on a cross collaborative basis, on a precompetitive basis, to raise all the boats in the industry to make us the best in the world when it comes to food safety is an important thing."

3) form strategic partnerships. Cross collaboration through strategic partnerships has made the industry as great as it is. "There is no question that places like Cal Poly are critical to the success of our industry, because they produce the bright minds that help us all continue to be successful in this industry." And

4) His final core principle is about building the team. You can never have enough good people. Get the best and the brightest, find lifelong learners, those who are not satisfied with the status quo. "Never look at a mistake from the side of what happened, but more from what can you learn from it."

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Larry Jensen, President, Chief Executive Officer, Leprino Foods

"At the core of all these principles is that dissatisfaction with the status quo. That really is the spark that gives you the opportunity to continue to push the boundaries, make changes and innovate," added Jensen.

General Mills' Erika Smith gave a background on her company's vision for research needs of the dairy industry. "Most people think of General Mills as a cereal company, but we actually regard ourselves a dairy company, primarily due to being the majority owner of Yoplait international, having a joint venture with Haagen-Dazs Japan, and we use a significant amount of dairy ingredients in many of our other products." Their company is experiencing significant international growth with more than 30% of sales outside of the US. They are currently the 6th largest food company in the world.



**Erika Smith, Senior Principal Scientist,
General Mills**

"Dairy is being consumed all around the world and there is a limited supply. The landscape continues to shift and we need to be nimble in order to respond to the different needs, not only to our consumers, but to our customers like Wal-Mart, and the populations in those countries that are demanding new products." Sustainability is a huge topic, our consumers and customers are constant asking for sustainability information, so then we ask our suppliers, who then ask the dairy farmers. We all have to work together on this to make sure we understand the sustainability story and to keep improving. Food safety is a big issue for the food industry, but also an opportunity especially if we want to expand on an international level.

"In terms of research topics, we need to continue to mine the wealth of ingredients that are in the great product that is milk." The dairy industry has done a wonderful job at this. Whey is a great example of that. Whey was being thrown away 50 years ago and now it is a premium, value added ingredient. What other new dairy ingredients are there out there that can be manipulated through fractionation?

"The dairy centers and companies such as General Mills need to work together, we need to anticipate what the needs of consumers are and then the research centers can help us how dairy ingredients can play into those needs." As resources are being constrained at both the university and food manufacturing levels, it is even more important that we work together.

"Simplicity," said Smith, "is a huge trend in the food industry today as consumers want cleaner, simpler labels with fewer ingredients. This is a great opportunity for the dairy industry to help replace synthetic ingredients with dairy."

Challenges include volatility and high cost of dairy remains a very significant challenge. There is already a protein shortage and it is only going to get worse as the world population grows. The dairy industry needs to continue to work on sustainability and increasing the amount of milk protein production per cow and decreasing the volatility of pricing. Globalization is also a consideration; we need to be able to get dairy where it needs to be with high quality and optimal safety. Another challenge for the dairy industry is the huge emergence of novel proteins, such as plant proteins, that will compete with dairy. General Mills has changed the way they look at innovation. Instead of just looking within to solve problems, they are looking to outside sources. They are even posting issues on their website where people can post solutions to address their highest technical challenges.

Bill Graves from Dairy Research Institute® was also one of the roundtable speakers. He explained that DRI was established under the leadership of America's dairy farmers through Dairy Management Inc. (the organization that manages the producer checkoff program.) Dairy Research Institute's mission is to "build sales and demand for dairy products and ingredients on behalf of the dairy farmers." Producers have had a nearly-century long commitment to investing in dairy research to drive sales and consumption. In 2010, they led the development of DRI as a separate 501(c)(3) nonprofit organization that could more easily partner with others to accelerate research results and also to accelerate investment in dairy research.



**Bill Graves Senior Vice President-
Product Research, Dairy
Research Institute**

Dairy Research Centers provide industry with research, education and technical assistance to drive innovation. Industry partners have access to the centers and their different research and development capabilities, such as product formulation or process development, which ultimately speeds innovation to deliver new or improved products with improved quality, performance and safety. Education and training is absolutely critical to the dairy companies in the industry. "The impact of the centers on dairy products and ingredient innovation has just been tremendous. One example is with artisan cheese. You can draw a direct line from the training that was done here at Cal Poly with artisan cheese processors to national and international award winning artisan cheese."

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**Bill Graves, Sr. VP, Product Research,
Dairy Research Institute.**

One of the challenges in the future will be meeting consumers' wants and needs. The Innovation Center for U.S. Dairy® is working to determine what those needs will be to help the industry innovate and deliver dairy and dairy-based products that consumers desire today and in the future. "For example, 50% more people will be managing diabetes by the year 2020. What sorts of research do we need to do now as an industry to be able to address this need?" We need to advance new technologies such as processing technologies like separation, which has changed the game in the last 25 years. Globalization is both an opportunity and a challenge. How are we going to step up our ability to be the preferred supplier?

After the presentations the floor was opened up for questions where again there was emphasis on the need for future innovation, leadership, partnerships, globalization and changing consumer needs.



Industry Roundtable Q&A: Dr. Phil Tong, Larry Jensen, Erika Smith, and Bill Graves

According to Dr. Rafael Jimenez, professor and symposium organizer, "It was delightful to see 'Legendary Professors' such as Norm Olson and Dave Barbano on our campus. All of the speakers from industry were also very eloquent and appreciative of the work of DPTC. After the conclusion of the Mini-Symposium, I have gotten great comments from the full house of undergraduate students who attended. This is very important, since the message from President Armstrong highlighted the benefits of DPTC to students and Cal Poly."