



Permeate Is Like the Dairy Industry's Coconut Water - August 2013



In all the excitement about the increasing demand for dairy ingredients and tight markets for dairy proteins worldwide, there is still one dairy ingredient that there seems to be plenty of and one that can't quite establish itself as a food ingredient. It goes by many names and is yet undefined. If you haven't guessed which ingredient I am referring to, its common names are deproteinized whey, high lactose whey, dairy product solids, permeate, or whey permeate. These ingredient names are in reference to a whey-derived permeate but of course there is also a milk permeate that has a very similar composition.

Regardless of the source, it is an ingredient that contains high levels of lactose (80-85%), minerals (8-9.5%), some non-protein nitrogen (3-5%), moisture (4-5%) and organic acids (<1%).

It has been available in the U.S. in a dried form for over a decade but according to ADPI, only about 20% is used for human food. Its not that animal feed isn't a good use for dairy ingredients but our goal as an industry is to get the highest value possible for our ingredients and food use usually returns a higher price than animal feed. I have often thought that permeate is like the coconut water of the dairy industry. Given that coconut water has increased its value several fold just by some UHT processing, shelf stable packaging and a little consumer education, the dairy industry should be hopeful that it could happen to permeate too. The first task is to try and educate food developers about what permeate is, what it can do, and what they can call it on a label.

I have been on a personal quest to help establish permeate as a food ingredient since the beginning of my career. As a new graduate of UW-Madison and working at my first real job at Ridgeview Industries (LaCrosse, WI) as a Whey Applications Specialist in the mid-80's, I was given the task of drying delactose permeate on a little pilot scale Bowen dryer at the offices of Thomas Technical Services (Neillsville, WI). Though it was really a portion of the original whey permeate, it was unbelievably difficult to dry. Needless to say, I didn't get very far on that project and I spent most of my time cleaning up the dryer. Some of you may have been working on drying and finding uses for permeate for much longer. Since this time I have been able to work with dried whey permeate in food applications beginning in 2000. One of the early things we discovered then was we were limited in the amount of permeate we could add to a baked product, in this case pound cake, because

of the salty flavor of the permeate. That discovery led to a lot more work using permeate as a way to reduce sodium in food products when sodium reduction resurfaced in 2010. There is work published on this characteristic of permeate and more work is continuing.

Other opportunities for permeate are more obvious and ones that are typical approaches for the dairy industry. We of course are good at cannibalizing our own high value ingredients with those of lower value, “cheaper” ingredients. NFDM replacement with WPC34 is a good example of that. Sweet whey replacement with permeate would be another. Although I would personally like to see “new dairy volume” created with the use of a new dairy ingredient to the food industry, many food companies will be willing to try and make the switch given that the cost benefit outweighs changing all of their ingredient legends. Speaking of coconut water, milk and whey permeate also contain minerals which also make it a “natural isotonic” when added to water. Another product you will find in published literature from back in the 90’s and shown at a couple of IFT shows in recent years. Replacing other carbohydrates in foods is another opportunity for permeate. The high amount of lactose in permeate gives it some unique properties and can help contribute moistness to baked products, reduce the sweetness of confections while providing a crystallizable sugar like sucrose, contribute to Maillard browning and help develop flavor in foods. These are just some of the characteristics of permeate as a food ingredient.

There are more opportunities beyond these for milk and whey permeate and together we can help establish these ingredients as food ingredients.

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