



The Cost of Research Innovation to the Dairy Industry - May 2015



To get a snapshot of new developments and trends that are occurring in the food industry world-wide, I follow the patent literature rather than the technical literature found in the scientific journals. Patent technology is generally more leading edge and pushes boundaries well beyond mainstream scientific thought with the primary drivers being business needs and resolution of an industry problems (i.e., “necessity is the mother of invention”). Over the last 5-6 years, I’ve notice a disturbing decline in patent applications from major U.S. dairy manufacturers, which should be of concern to our industry. Patent numbers or frequency of applications are a strong indicator of the level of research investment for any industry and are especially important indicators for the health and long term growth of an industry segment; our dairy industry in this case.

Review of the current patent literature is even more telling of the lack of dairy technology innovation in the U.S. There are significantly more patent applications from European dairy manufacturers than counterparts from North America. For example, Nestle’ (through their research arm, Nestec) filed 84 new patent applications in the first quarter of this year alone. Nestle’ has always been technologically focused, the major reason why today they are the largest and most credible food manufacturer world-wide. Japanese dairy companies continue to patent consistently in technology areas like enzymes, nutritionals, and interesting new products. U.S. dairy manufacturers are generating less intellectual property, as reflected in reduced numbers of patent applications over-all. On the flip side, the number of U.S. patent applications related to food safety is on the rise, likely the result of FSMA and food manufacturers protecting their bottom lines from huge liability claims.

Another alarming concern to the U.S. dairy industry should be the steady reduction of basic dairy research funding over the last 5-10 years through the farmer check off program as administered through Dairy Management Inc. DMI has been the mainstay for basic dairy research funding, especially since the creation of the regional dairy research centers in the late 1980’s. Dairy check off dollars can be directly linked to technical developments leading to improved methods of cheese manufacture, whey processing and whey applications developments, nutritional and health education, and other valuable contributions that have helped to expand industry offerings and provide improved returns to both manufacturers and dairy farmers. However, with dwindling research dollars available to the Dairy Centers, we’re losing both valuable research and researchers because of a declining focus on basic dairy research.

So where are the research opportunities for growth in the U.S. dairy industry? Two areas for major growth opportunities are 1) the development of new dryer technologies for the manufacture of dairy powders, and 2) application of MF milk retentate (A.K.A., micellar casein) in the manufacture of cheese and cheese snacks in the U.S. On the first opportunity, tall form dryers we employ today to dry milk powders, whey, etc., are among the most (if not the most) inefficient piece of equipment in most dairy processing plants. Although there have been improvements in burner technology (to reduce the nitrates and nitrites that older dryers generate in dairy powders) and energy efficiency, the energy expended to produce powders could be significantly conserved by taking cues from other industries that have developed ambient temperature drying technology and lower cost, more efficient microwave drying technology.

With respect to use of micellar casein (or MF retentate), our industry needs to capitalize on all available and developing membrane separation technology for cheese manufacturing efficiency and development of unique, new, cheese snacks and varieties. Despite current regulatory hurdles in place that get hung up on nomenclature and ignore leading edge innovation, in-plant microfiltration of milk and use of MF retentates in the cheese vats only makes logical sense by putting milk components in the correct place when standardizing milk for cheese manufacture (i.e., casein in the vats and whey proteins removed prior to cheese manufacture). Currently acceptable, in-process, milk ultrafiltration for vat standardization certainly helps cheese processors, but micro filtration is much more efficient and results in higher quality whey and improved cheese throughput.

To summarize, it's not about the cost of innovation that should be of a concern to dairy industry members, but rather, the cost of not investing in basic research and innovation. Much like business, researchers gravitate to areas that provide solid and consistent funding, and we should make every effort to attract the best researchers to support our industry. We should also be looking outside our industry for some of the technology solutions to issues in our industry, but in the end, investment in dairy research is the only means of investment for the long term growth and technical advancements. I had a very wise boss years ago who used to ask me every morning, "any new breakthroughs today?" That's the attitude we need to keep our industry both healthy and viable.

Dr. Schroeder has over 30 years of laboratory and in-plant experience in the dairy industry, having worked in high level research and quality positions for Pfizer, Inc., Mid-America Dairymen, Dairy Farmers of America, Land O'Lakes, and DairiConcepts. He has expertise in virtually all aspects of dairy product and process development, ingredient applications (fluid milk, cheese, whey, cultured products, enzyme technology, antimicrobials), as well as in QA and regulatory arenas. His success lies in a strong background in microbiology, biochemistry, and dairy technology.

Dr. Schroeder currently owns his own consulting business, Science Solutions, LLC, supporting businesses in the dairy, food and beverage, and pharma industries and is a member of the ADPI Center of Excellence.

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