



BioIonix News

A Clean Technology Company

Early Spring 2011

Highlights:

CEO Letter

- Recent activities
- McEntire Produce order
- New product developments

New Installation: Costco Wholesale

Meet our Team!

- Brian Hale

New BioIonix Feature:

- Online disinfection efficacy estimate

New Installation: McEntire Produce

Breaking News!

- BioIonix oil and gas industry opportunities

Recent Milestone Accomplishments

BioIonix Mezzanine Funding Round

BioIonix 2011 Trade Show Calendar



So what's been happening at BioIonix since our last newsletter? After reading this I hope that you agree that there's been quite a lot. In 2010 we had our first significant sales revenue and began 2011 with a backlog of \$583,000 in orders. Since the late fall of 2009, we have installed four BioIonix systems at customers representing three very large food processing markets: Gerber Poultry (Kidron, Ohio) for the disinfection of poultry chiller water, Sara Lee (Alexandria, Kentucky) and Costco Wholesale (Tracy, California) for the disinfection of the very cold brine used to rapidly cool cooked meat products to storage temperature.

And just this past month, we started up our system at McEntire Produce (Columbia, South Carolina) that treats the flume water that washes and disinfects fresh cut bagged salad vegetables.

With a bit of tongue-in-cheek we can say that we now have installations coast-to-coast. We also have been doing advanced development work with leading food processors in additional market segments and have orders pending. And we have been talking with two of our existing customers about additional orders. In addition, we're working with a number of potential customers in the markets where we already have reference plants.

McEntire Produce Order. In our summer 2010 newsletter I told you about the advanced development work we were doing in the prepackaged salad market. That work turned into an order from McEntire Produce, a leading fresh-cut vegetable supplier that serves the entire southeastern U.S. They supply high quality, ready-to-eat salad and cut vegetables to some of the biggest names in fast foods and casual restaurant chains. You can read more about McEntire inside.



McEntire Produce, Columbia, South Carolina. BioIonix's first packaged salad food quality assurance installation.

New Product Developments. From the beginning we've done our best to design quality equipment that can withstand the rigors of 24/7/365 operation. We have a very experienced engineering and fabrication team and our systems are proving to be rugged and reliable in the field. Plant operators appreciate the set-and-mostly-forget nature of our automated controls. No chemicals to buy or store. No fussy dosing equipment and no dispensing tanks to keep filled. No moving parts and fully automated cleaning.

At the same time, in the last year we've continued to refine our product in a number of ways. These include a breakthrough, patent-pending online estimate of disinfection efficacy, improved catalyst performance and life, and other new pending patents.

P.S. On page four you'll find information on our upcoming mezzanine financing round to take us to profitability and rapid sales growth. I invite you to contact me to learn more.

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New Installation: Costco Wholesale

Costco Wholesale, simply "Costco" to most of us, has been a strong leader in food safety. In a 2009 series of articles following a ground beef recall by another company, The New York Times reported on the very positive policies and practices of Costco regarding food safety.

In late fall 2010, BiIonix started up its new brine chiller installation at Costco Wholesale at its new meat processing plant in Tracy, California. It's a beautiful installation made through our OEM partner, Alkar-RapidPak in Lodi, Wisconsin.

Costco is known for its premium hot dogs sold in its stores at the concession stand, and BiIonix now provides the pathogen control of the concentrated salt water, "brine", that rapidly cools this product from cooking temperature to cold storage packing temperature. Our OEM partner, Alkar-RapidPak, supplied the continuous cooking line and much of the other equipment for this plant.

Costco has two goals that led them to choose the BiIonix process. One is to keep this brine reliably disinfected for food safety reasons. The other is to permit this brine to be reused for weeks at a time to minimize water use in the plant. To do both is almost impossible using other disinfection processes like chlorine or ultraviolet radiation. Extended use of chlorine can lead to exceeding safe free and total chlorine levels. Ultraviolet radiation loses its effectiveness as the brine gets cloudy with dissolved and suspended solids.

Costco quality control tells us the BiIonix process is running well and that their product quality control results have been outstanding to date. One new refinement in this installation is that Costco will provide us with remote access to our control system when needed. This will let us perform equipment operator assistance and troubleshooting right from our office for a faster and more cost-effective resolution of service matters.



The BiIonix Costco installation. On the top left is a liquid flow meter, one of several sensors monitored by BiIonix's automated control system.

Meet Our Team!

Brian Hale

Brian Hale is BiIonix's power electronics and controls engineer. An electrical engineering graduate from the Milwaukee School of Engineering, Brian has many years of experience in the food processing industry in his prior engineering roles at APV/Crepaco.



Brian Hale with BiIonix's operator-friendly touchscreen interface. When everything is green, the operator knows the system is running properly.

Brian takes primary responsibility for the design and programming of the company's power and control systems. These components are mounted in a rugged, water resistant stainless steel enclosure standing up to seven feet tall. They supply and control the hybrid power that activates the disinfection catalysts in the separate BioIonix reactor module through which the liquid to be treated flows.

At Brian's side in the photo is the portable touchscreen panel used to develop the operator interface for the control system. We also use it at trade shows to demonstrate the ease of use of the BiIonix system and our new online disinfection efficacy estimation feature, described in more detail in the article at the right.

Brian also acts as a project engineer in the field during equipment startups and product commissionings. He uses this field experience to optimize the control interface so that it is understandable and friendly to equipment operators. Brian is a named inventor on three of the company's U.S. patent applications, plus foreign equivalents.

New BiIonix Feature: Online Disinfection Efficacy Estimate

One problem food processors face is that they really don't know if they are producing a safe, pathogen-free product for the 24-36 hours it takes for laboratory product safety results come back. BiIonix has reduced this problem with a new, and patent-pending method to provide an online, real-time estimate of disinfection efficacy. While only wet chemistry results can confirm disinfection, food processors have reacted well to this new feature.

The BioIonix control system silently monitors flow rates, product temperature, and various sensors that provide data on process efficacy. When everything is within the optimal operating window, all indicators on the touchscreen remain green. An operator can see this from across the room and be confident that the system is operating properly.

If operating conditions are compromised, for example by a plugged strainer that slows liquid flow through the BiIonix reactor, one or more of the indicator boxes changes to yellow or red and a written warning with troubleshooting recommendations is displayed on the panel. For serious matters a warning horn will also sound. The control system can also send these warnings to a central monitoring system to provide management with these alerts.

During startup and commissioning BioIonix refines the estimation parameters for each installation. BiIonix has a pending U.S. patent on this method and has made an international patent application as well.

New Installation: McEntire Produce

BioIonix's latest installation is at McEntire Produce in Columbia, South Carolina. Similar in many ways to Madison, Columbia is South Carolina's state capital and home to the University of South Carolina. McEntire Produce is BioIonix's first installation in the rapidly growing fresh-cut vegetable processing market.

Founded in 1938, McEntire is a recognized leader in food safety practices and their purchase of a BioIonix system reflects this commitment. Their customers include McDonalds, Taco Bell and many other demanding fast food and casual restaurant chains.

Not many people are aware of it, but it actually takes far more water to wash produce than it does to grow it. Fresh-cut produce in the form of salad mixes, chopped salad bar toppings and shredded cabbage for coleslaw must be free of contaminants before it goes in the bag, and must remain safe all the way to the consumer's plate. At McEntire, the BioIonix process helps ensure that this happens.

Maintaining the quality and freshness of salad vegetables is a real challenge. They have the highest water content of any food products, 95% water for lettuce, 93% for cabbage and similar percentages for other salad vegetables. They pick up off-tastes and odors easily, complicating the use of chlorine at levels that can provide reliable disinfection. They wilt easily so any treatment must not harm the cell structure of the product. Processors and their customers want the longest shelf life possible to avoid waste and returns.

McEntire's production schedule doesn't allow much time for installing equipment. That can only be done when the plant is not operating. Fortunately, McEntire plant personnel worked closely with our installation crew to get things done. Production stopped at 2:30 pm on a Saturday and by late in the evening on Sunday all equipment placement, piping and power wiring were completed, and various pumps and instruments were installed and connected. Pressure testing and electrical checks also had been performed. All that remained on Monday was to do final control and equipment calibration and the unit was ready for operation.

The BioIonix process is installed on one of several high volume production lines in the plant. The company has the option to purchase additional BioIonix systems during the next year. This is a great reference plant for our company in a very large and fast growing segment of food processing.



Prepackaged salad mix starts with giant vegetables like these massive heads of lettuce that have just had their cores removed. They move on to machines that cut, mix and fill the ingredients into controlled atmosphere packaging.



The compact size of the BioIonix system allows it to fit into tight spaces. As shown in the photo, the reactor module is below the mezzanine that contains the vegetable washing flumes, while the BioIonix power and control cabinet is located on the mezzanine itself for operator convenience.



Chopped Lettuce



Red Cabbage



Green Cabbage



Spring Mix



Diced Onions



Shredded Lettuce



Shredded Carrots



Salad Mix

Right: A selection of McEntire Produce's fresh-cut vegetables. McEntire is using a BioIonix system to help ensure the quality and shelf life of its products.

Market News!

BioIonix Oil & Gas Industry Opportunities

We've been receiving unsolicited interest about the BioIonix process from the oil and gas industry. As a company with limited resources, we're always careful to keep focused on our selected initial target markets, but this opportunity looks very promising. On October 10, 2010, the Oil and Gas Innovation Center, a industry technology research group, published an overview of the BioIonix process for its oil and gas industry subscribers. Here's a quick overview.



Injection Water. North Sea oil platforms provide a high quality crude. As these fields age, producers are injecting sea water into the undersea structure to cause the crude to rise and thereby maintain well production rates and increase total recovery. The problem is that this seawater contains sulfur reducing bacteria that react with the crude to reduce its quality and value. Producers have tried other disinfection technologies like chlorine and UV, but there are problems associated with their use. A Norwegian oil industry engineer calculated that individual wells on a typical North Sea oil platform have injection water needs that match the flow rates of BioIonix's equipment.

Fracture Water. In a similar manner on land, oil and gas producers inject water to fracture the underlying rock structure to increase well flow rates and yields. Chlorine disinfection reportedly adversely affects the polymers added to this water and the BioIonix process has the potential to be used in this application.

Produced Water. Oil and gas production also generates produced water, which comes out with the oil. There is increasing pressure to more effectively disinfect and treat this liquid prior to discharge or reuse as fracture water.

Funding from the upcoming investment round will be used to hire a sales manager with appropriate experience to develop this and other applications outside of food processing.

BioIonix Mezzanine Investment Funding Round

BioIonix's products are fully developed and customer installations have been made at four major food processors in three different market segments. USDA regulatory approval has been obtained, and sales to date have demonstrated the customer need for, and acceptance of, the BioIonix technology.

BioIonix is currently raising a \$3-\$5 million mezzanine round of equity funding, the exact amount to be determined based on investor interest. This funding is expected to take the company to profitability and be the last one required prior to an attractive opportunity to sell the business. A \$5 million investment round permits the company to increase its sales staff, marketing activities and applications development at a faster rate, providing additional security to the sales forecast and a potentially higher exit valuation.

If you are an accredited investor interested in exploring this opportunity, please contact Jim Tretheway, BioIonix president and CEO, for further information.



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Recent Milestone Accomplishments

Four Commercial Installations

- Gerber Poultry, Sara Lee, Costco and McEntire Produce.

Installations in Three Large Market Segments

- Disinfection of processed meat chiller brine, poultry chiller water, and vegetable processing flume water.

Sales Growth

- \$147K in 2010.
- January 2011 Backlog: \$583K.
- Additional orders pending.
- 2011 sales forecast: \$1.5 million.

New Market Development

- Additional food processing industry market segments.
- Non-food opportunities identified.
 - Oil and gas industry, cooling towers, others.

Catalyst Life Improvements

- From one supplier and one catalyst to three suppliers and six catalysts matched to specific applications.

Patent Portfolio Expanded

- Four issued patents, four pending U.S. patents and three PCT stage international patents.

Next Milestones:

- Finalize \$3-\$5 million mezzanine investment round to support rapid sales growth and reach profitability.
- Achieve calendar year 2011 sales forecast of \$1.5 million.

BioIonix 2011 Trade Shows

Jan 26-28 International Poultry Expo 2011.

Major poultry processing trade show.

May 3-4 United Fresh 2011. Leading produce industry meeting.

Nov 1-4 Process Expo. Major trade show for the processing of meats and other foods. This show is combined this year with the annual meeting of the Institute of Food Technologists.