BIOIONIX®

Advanced Food Safety Microbial Control Systems

Meat Processing
Brine Chiller Disinfection

Application Note **165**

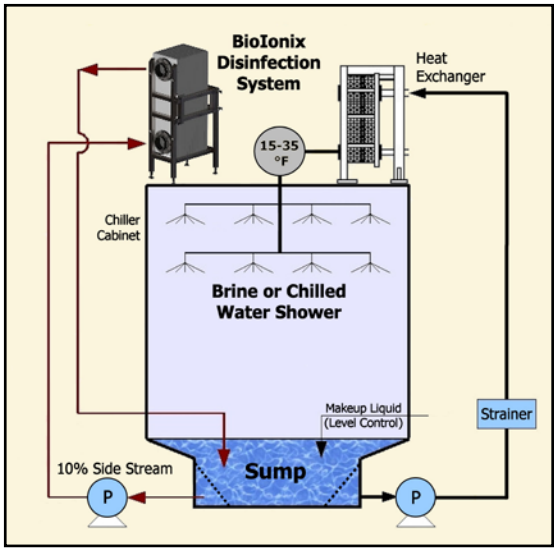
The Application Challenge

Processed meat and poultry products often are rapidly chilled from cooking temperature to packaging and slicing temperature by the use of concentrated, chilled salt water (brine) or very cold fresh water cascaded or sprayed over these products in the brine chiller section of a continuous processing oven. For batch cooking operations this fast cooling may take place in a separate chiller cabinet.

The use of salt brine permits the chiller liquid to be maintained at a temperature well below 32ºF, typically 15-25ºF. This allows for more rapid chilling of the product to its internal temperature target and at the same time reduces the likelihood of bacterial growth in the brine. Still, even at these low temperatures listeria monocytogenes, a human pathogen, and other cold loving bacteria can thrive and grow.

In the past, many processors provided a level of pathogen control of this brine using bleach, citric acid, ultraviolet radiation (UV) and even pasteurization. In most cases their own laboratory test results typically have shown limited efficacy, resulting in the need to discharge this brine as often as daily.

Solution: BioIonix Advanced Brine Disinfection



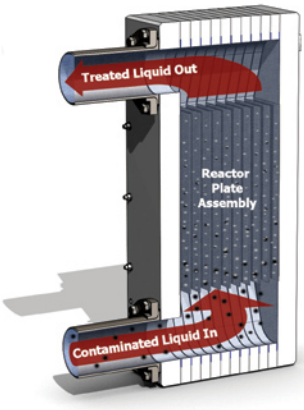
The breakthrough BioIonix electrocatalytic process continuously disinfects brine (or cold chiller water if that is used instead) by generating a powerful combination of reactive oxygen and activated chlorine species right from the brine stream itself. These BioIonix SuperOxidants™ attack microbials by complementary methods of action, including direct DNA destruction, cytoplasm impairment and cell wall disruption. It's reactive oxygen species are effective against chlorine-resistant bacteria and help prevent biofilms. And its activated chlorine alone is up to 100 times more powerful than sodium hypochlorite as a disinfectant.

BioIonix disinfects turbid brine that is opaque in color and that contains significant levels of suspended and dissolved solids. The BioIonix process is safe, reliable and environmentally friendly. Today the BioIonix advanced catalytic disinfection process is replacing these methods and is providing effective long-term microbial control of meat processing chiller brine. BioIonix systems have been proven reliable and effective in multiple large commercial installations at leading meat processors. In many plants this can lead to longer processing line running times and reduced time spent on CIP cleaning.

BioIonix's compact footprint fits even in tight plant layouts.

BioIonix Process Benefits:

- Effective and fully automated disinfection.
- Operators and QA have a good feel for microbial control performance...with BioIonix's exclusive online disinfection efficacy estimate.
- Dramatically extends brine life.
- No chemicals to buy or dispense.
- Eliminates mold, extending packaged product shelf life.
- Prevents biofilm buildup in the chiller, piping and other surfaces.
- Continuous 24/7/365 treatment.
- Designed to 3A standards and for full CIP.
- USDA accepted for meat and poultry applications.



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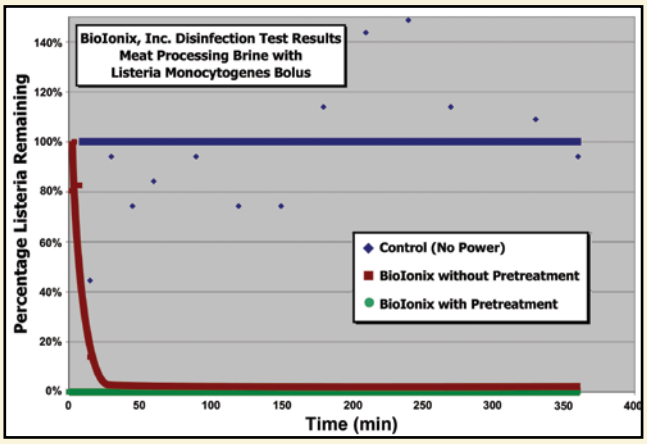

A Proven Best Practice in Brine Disinfection.

A result of over ten years of research and development, the BioIonix process is becoming recognized as a proven "best practice" for the disinfection of meat processing brine chiller liquids. Improved, consistent disinfection is a certainty along with dramatic increases in useful brine life. These lead to greatly reduced water and salt use...and far lower chloride discharges to the local wastewater plant. That combined with BioIonix's fully automated operation and online disinfection efficacy estimate has BioIonix disinfection becoming the method of choice for leading processed meats manufacturers.

More on the Benefits of the BioIonix Process

Whether your responsibilities include plant management, operations, quality control or maintenance, BioIonix is designed to make brine chiller microbial control easier for you.

Consistent, Effective Disinfection. The fundamental benefit of the BioIonix process. The automated control system is designed to maintain the chiller brine at near zero total plate counts for weeks at a time. It automatically adjusts treatment when sudden organic loads occur due to broken product or other challenges to microbial control. No disinfection failures due to chemical dispensing problems. No failures due to color and turbidity of the brine.

BioIonix Exclusive Online Disinfection Efficacy Estimate. Another key benefit of the BioIonix process. Operations and QA no longer are in the dark about expected microbial control. BioIonix directly measures key parameters affecting disinfection performance and combines them to both control the process and to provide an online real-time estimate of disinfection efficacy. This estimate has proven to be a reliable indicator of disinfection efficacy as confirmed by normal lab methods 24-36 hours later.

Chemical Cost Savings and No Personnel Risk. Some of the chemicals used for disinfection today can get pretty pricey. And they can be complicated to use, requiring pH control and precise dispensing to avoid unacceptably high free chlorine levels. Many are quite hazardous to those handling them. All of this can be eliminated by adopting the BioIonix process for brine microbial control.

Elimination of Operator Error. We all know how busy operators can get. BioIonix's automation eliminates the need for regular operator intervention. No disinfection chemical jugs to run dry. No plugging of dispenser valves or lines. If the disinfection efficacy light is green, no operator involvement is needed.

Water Savings. This comes automatically when you can use your brine longer with the BioIonix process. Not only is the cost of water going up everywhere in the country, but aquifers are being drawn down even in former water rich areas. Reducing water use in the chiller may allow that water allocation to be diverted for other plant capacity expansion use. And any reduction in water use can help the company meet its internal water conservation and sustainability goals.

Salt Savings...and Chloride Discharge Limits. Food grade sodium chloride isn't as cheap as it used to be. Substantial reductions of salt use happen when the BioIonix process allows the chiller brine to be used longer so salt costs go down. With the EPA dramatically limiting chloride discharges, holding brine longer significantly reduces this operating challenge as well, sometimes to less than 10% of a line's current chloride discharge level.

Wastewater Issues. Wastewater issues are becoming a growing concern for food processors. In smaller communities a food plant may be a major contributor to the total load of the wastewater plant. The EPA is cracking down on the discharges of these plants, everything from volumes, chloride content, BOD levels and suspended solids. The pain moves up the chain right into your plant. If you don't have a chloride discharge issue today, the EPA most likely will give you one tomorrow. Rather than wait for this to happen, installing a BioIonix system now will give you all the benefits today that BioIonix offers while avoiding a regulatory fine and urgent upgrade down the road. All of your wastewater pain goes down when a BioIonix system permits extended brine use.

Increased Processing Line Capacity. This may not happen in every BioIonix installation, but some BioIonix customers have seen this benefit. To date it has come from situations where frequent brine discharge is needed to help control bacteria levels, or where CIP of the brine section and the preparation of new brine limit the run time of the processing line. BioIonix customers have reported up to a 15% effective line capacity increase, with reduced CIP labor and lower CIP chemical use.

Extensive Operating Data. The BioIonix control system collects a significant amount of operating data. Things like the temperature of the brine, its salinity, the flow rate through the reactor modules, whether the BioIonix system was turned on, and other sensor data that tells a lot about estimated disinfection efficacy. This detailed operating information can be very helpful to accurately define when an operating anomaly occurred, limiting the extent of any product hold or other contemplated action.

BioIonix automated control system with exclusive online disinfection efficacy estimate.

While this report is focused on brine disinfection, BioIonix also effectively disinfects cold chiller water in plants where concentrated brine isn't used.

8/1/2013