

Study identifies potential antimicrobial treatments to prevent listeriosis caused by Queso Fresco cheese

By Alyssa Condon

Food safety and protection from foodborne illnesses is of utmost importance to all levels of the food supply chain—from producers, to retailers, to consumers. To advance the knowledge and prevention of foodborne illnesses, the pathogens that cause them must be extensively studied. Dr. Dennis D’Amico and his lab recently released a study in the *Journal of Food Protection* that examined the efficacy of several antimicrobial dips as preventatives of the growth of *Listeria monocytogenes*, a common cause of foodborne illnesses, in Queso Fresco cheese. *L. monocytogenes* is the cause of an estimated 1,600 cases of illness in the United States each year, incurring costs of an estimated \$2 billion. Because *L. monocytogenes* contamination generally occurs post-pasteurization, techniques to reduce the growth of this pathogen on the finished cheese product must be explored. To do so, the authors of this study inoculated samples of Queso Fresco, a soft, Hispanic-style cheese, with *Listeria monocytogenes* and then immersed each sample in different antimicrobial solutions and refrigerated them. The antimicrobials included hydrogen peroxide (HP), calcium sulfate with lactic acid (ACSL), ϵ -polylysine (EPL), lauric arginate ethyl ester (LAE), and sodium caprylate (SC). These compounds were chosen because recent studies have shown their anti-listerial activity, and all of them, with exception of sodium caprylate, are generally regarded as safe by the United States Food and Drug Administration. The growth of the pathogen was then recorded periodically over the course of 35 days.

The authors found that hydrogen peroxide significantly reduced *Listeria monocytogenes* counts in all phases of the study. However, the potential for HP to cause rancidity in cheese indicates that these effects should be further studied before regarding it as a preferred treatment for inhibiting *Listeria monocytogenes* on Queso Fresco. In contrast, EPL had no significant effects on *Listeria monocytogenes* counts throughout the test period. LAE initially reduced *Listeria monocytogenes* counts in the first 24 hours, but then levels returned to normal after 7 days and continued to increase. The combination of LAE and EPL as antimicrobial treatments showed the same effects of LAE alone. Treatment with ACSL exhibited the same effects as treatment with LAE, with *Listeria monocytogenes* counts initially declining, but then continuing to grow and exceed initial counts. SC showed some inhibition over a 21-day shelf life, and combinations of SC and the other antimicrobials showed similar effects over that 21-day period. However, these combinations were not the most effective antimicrobial treatment. Overall, hydrogen peroxide displayed the most potential as a post-pasteurization antimicrobial defense in Queso Fresco.

This information is important, specifically for the production of Queso Fresco. Of the 18 outbreaks of listeriosis caused by dairy products in the United States from 2003 to 2015, seven were linked to Hispanic, soft-style cheeses like Queso Fresco. Dr. D’Amico expects this study to advance the prevention of listeriosis outbreaks caused by these types of cheese. He states: “The results of this study identify practical antimicrobial interventions the dairy industry can

implement to enhance food safety by controlling *Listeria monocytogenes* on Queso Fresco and similar high risk cheeses.”

The entire article can be found here:

Kozak, S.M., Y. Bobak, and D.J. D’Amico. Efficacy of antimicrobials applied individually and in combination for controlling *Listeria monocytogenes* as surface contaminants on Queso Fresco. *Journal of Food Protection*. 81(1):46-53.