**Antimicrobial Ice: A Solution to Ground Beef Contamination**

Foodborne illnesses are very prominent in our world today. Although the food industry has advanced in technology and techniques and regulations are set in place to ensure safety, it is still very difficult to completely prevent bacteria from working its way into our food. Bacterial pathogens such as E. coli, Salmonella and Listeria are notorious for contaminating food products and can be very difficult to control. Salmonella is common in raw chicken, while Listeria is common in cold food products, especially ice cream as we saw in the Listeria outbreak in the Blue Bell factory recently. Once contamination has started, it runs rampant and the bacteria can reside even in parts of the machines that help in production of certain food products. This means that even if the food product itself is clear of contamination, once it moves through the machines it can become contaminated with a bacterial pathogen. Ground beef is a very common source of meat for many United States families, while beef itself is usually free of contamination, ground beef is more prone to contamination because of the processing it has to go through, especially when it goes through a meat grinder. E. coli 0157: H7 is the main culprit when it comes to ground beef contamination. Dr. Ravi Jadeja, here at Oklahoma State University is conducting research to find a way to clean meat grinders without completely disassembling them, by using an antimicrobial ice. I had the opportunity to interview Dr. Jadeja on his progress in this research.

Dr. Jadeja is an assistant professor and food safety specialist here at Oklahoma State University. He holds a B.S. in Biotechnology, M.S. in Food Biotechnology and a Ph.D in Food Science. Dr. Jadeja told me that he has been involved in research for 10 years and has had 22 peer-reviewed publications. The current research publication he is working on is an antimicrobial ice. In our discussion, Dr. Jadeja stated that, “an estimated 60% of all beef retail sales are in the form of ground beef”. He discussed with me that the current industry protocol states that the meat grinders have to be completely disassembled and sanitized at the end of every shift. Dr. Jadeja discussed this as an issue, he stated “if contamination occurs between two cleaning operations, then large of amounts of the product could be contaminated and subjected to recall”. Because of this issue with contamination, even with the sanitation protocols in place, Dr. Jadeja has come up with a possible solution for this issue, an antimicrobial ice. He said the use of an antimicrobial ice would sanitize the meat grinder without having to disassemble the machine. The antimicrobial ice he is working on contains an antimicrobial agent from a large manufacturer, which was unnamed. Dr. Jadeja is freezing this solution in water and using it to run through meat grinder machines to see if it will be successful at completely sanitizing the machines. Dr. Jadeja said that even though he is using a manufacturer’s antimicrobial agent, in the past he has used chlorine as an antimicrobial agent in ice and it has had success. Dr. Jadeja stated “This research will provide an economical and rapid intervention step to sanitize meat grinders without disassembling them. This novel method could provide a rapid alternative to the traditional meat grinder sanitation process.” Chlorine, like many antimicrobial agents, works by killing bacterial cells because when it is placed in water it becomes an acid, called hydrochlorous acid. Even the antimicrobial agent Dr. Jadeja is working with is an acid. This acids work because they lower the pH level of the environment, which bacterial pathogens such as E. coli cannot survive under. As a result, it kills the bacteria living in and amongst machines, such as meat grinders.

Dr. Jadeja said he has had much success in the past with using antimicrobial ice as a sanitation process for ground beef meat grinders. Not only would this eliminate extra labor and be economically savvy, it would also cut down the risk of contamination. Although disassembly and sanitation works, sometimes the machine becomes contaminated in between cleaning operations. This antimicrobial ice would greatly cut down the risk of contamination and help to further prevent recalls and the spread of foodborne illnesses from ground beef.

References

Jadeja, R. (n.d.). A Novel Antimicrobial Ice Based Cleaning-in-Place Meat Grinder Sanitization Process Development. Retrieved from <https://scholardevelopment.okstate.edu/sites/default/files/A%20Novel%20Antimicrobial%20Ice%20Based%20Cleaning-in-Place%20Meat%20Grinder%20Sanitization%20Process%20Development.pdf>.

Rock, A. (n.d.). How Safe Is Your Ground Beef? Retrieved April 15, 2017, from http://www.consumerreports.org/cro/food/how-safe-is-your-ground-beef