

Harnessing the Power of the Hydroxy-Radical for Human pathogen Reduction and Shelf-life Extension: From Farm to Fork

The generation of hydroxyl-radicals from hydrogen peroxide was first described by Henry Fenton in 1862. Since this time, the oxidative power of hydroxyl-radical has been used as a reagent, for treating wastewater and more recently, in the gas phase for decontaminating food and non-food surfaces. The presentation will provide recent advances in hydroxyl-radical based process with applications on the farm as an alternative to pesticides and hatchery for disinfection of eggs destined for hatcheries. In process, the hydroxyl-radical process for treatment frozen berries, fresh fruit & vegetables, microgreens and meat will be described. Applications for decontaminating reusable plastic crates, conveyors through to reusable shopping bags. The underlying chemistry of hydroxyl-radicals and results from pathogen validation trials and extension of shelf-life will be provided.

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Dr. Warriner is currently a Professor within the Department of Food Science at University of Guelph, Canada. Dr. Warriner received his BSc in Food Science from the University of Nottingham, UK and PhD in Microbial Physiology from the University College of Wales Aberystwyth, UK. He later went on to work on biosensors within the University of Manchester, UK and subsequently returned to the University of Nottingham to become a Research Fellow in Food Microbiology. He joined the Faculty of the University of Guelph in 2002.

During the last twenty-five years in the field of microbiology and food safety research, Dr. Warriner has published more than 200 papers, book chapters, patents, and conference abstracts. His research interests are focused on enhancing food safety within meat processing, fresh cut sectors and more recently, in the area of marijuana edibles. To this end, his research team have advanced knowledge in the area of emerging pathogens, intervention technologies and development of biosensor devices to detection of foodborne hazards. His research in UV is developing novel decontamination methods based on gas phase hydroxyl-radicals for treating food surfaces and more recently N95 masks along with other personal protective equipment. He was awarded the Ontario Innovation of the Year award in 2017, OCE Mind to Market award in 2018, IAFP Food Safety Innovation award in 2019 and University of Guelph Innovation award in 2020. He is frequently contacted by the media to provide commentary on food safety issues and is the past President of the Ontario Food Protection Association. He is currently the Chair of the University of Guelph Biosafety committee, Director of the OMAFRA HQP Scholarship program and Associate Editor for several journals.