

Food Safety And Regulatory Measures

May 23-24, 2019
Zurich, Switzerland

Ali Demirci, J Food Nutr Disor 2019, Volume 8
DOI: 10.4172/2324-9323-C3-028

Decontamination of foods by pulsed ultraviolet light: A review

Ali Demirci

Penn State University, USA



Pulsed Ultraviolet (UV)-Light is an emerging technology, which has a potential to be used for decontamination food products. The light generated in pulses consists of a continuum broadband spectrum from deep UV to the infrared, especially rich in UV range below 400 nm, which is germicidal. The recent studies suggest pulsed UV light inactivates microorganisms not only photochemical reactions, but also by other mechanisms associated with the use of high intensity pulses such as photo-thermal and photo-physical mechanisms, microbial cells become inactive with conventional UV induced photochemical reactions have taken place, but the cell structures remain intact after UV treatment. However, pulsed UV light also damages the cell structures for some of the pulsed UV treated cells. Therefore, pulsed UV-light can be considered a powerful tool for inactivation of microorganisms on food surfaces or liquids. Many studies have demonstrated the effectiveness of pulsed UV-light on microbial loads on food surfaces. In this paper, various studies in our lab for applications of pulsed UV-light treatment will be summarized. Pulsed UV light is an emerging technology, which has a great potential to be used for the decontamination of foods. This paper will not only provide a review for the recent applications of this technology, but also increase awareness of this technology for the food industry.



Recent Publications

1. Uslu G, A Demirci and J M Regan (2016) Disinfection of synthetic and real municipal wastewater effluent by flow-through pulsed UV-light treatment system. *Journal of Water Process Engineering* 10: 89-97.
2. Keklik N M, A Demirci, and R Bock (2011) Surface decontamination of whole chicken carcasses using a pilot-scale pulsed UV light system. *Transactions of ASABE* 54(3): 993-1000.
3. Keklik N M, A Demirci, and V M Puri (2010) Decontamination of unpackaged and vacuum packaged boneless chicken breast with pulsed UV-light. *Poultry Science* 89(3): 570-581.

Food Safety And Regulatory Measures

May 23-24, 2019
Zurich, Switzerland

4. Bialka K L and A Demirci (2008) Efficacy of pulsed UV-Light for the decontamination of *Escherichia coli* O157:H7 and *Salmonella spp.* on raspberries and strawberries. *Journal of Food Science*. 73(5):M201-M207.
5. Demirci A and L Panico (2008) Pulsed ultraviolet light. *Food Science and Technology International*. 14: 443-446.

value-added products; ii) Inactivation/control of pathogenic microorganisms in foods and environment by novel non-thermal processing methods. He holds two US patents and has authored numerous refereed journal article and book chapters. He is currently serving as the Associate Editor for Transactions of ASABE and has served on editorial boards of several peer-reviewed journals. He has received his PhD degree in Food Science and Technology with a minor in Chemical Engineering at Iowa State University in 1992. He began teaching in the Department of Food Engineering at University of Gaziantep, Turkey. Then, he worked as a Research Associate at Iowa State University until he joined to the Department of Agricultural and Biological Engineering at The Pennsylvania State University in 1999.

Biography

Ali Demirci is a teacher. His recent research is focusing on Microbiological Engineering which has two directions:
i) Bioprocessing/fermentation processes for productions of

demirci@psu.edu