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## Improving Food Safety and Quality Using High Voltage Atmospheric Cold Plasma (HVACP) Technology

*Wednesday 29 May 2024 11:00 (30 minutes)*

This presentation will provide an overview of HVACP research in the Sustainable Food Systems Innovation Laboratory at the University of Guelph and highlight potential commercial applications for this cold plasma technology. Plasma, also known as the fourth state of matter, is defined as a partially ionized gas composed of electrons, ions, radicals and elements (O, N, H) in an excited state. Atmospheric cold plasma treatments produce 1,000's of ppm's of reactive gas species (RGS) from air (e.g., peroxides, ozone, nitrates), while maintaining a gas temperature of 40 oC or less. The RGS can achieve rapid decontamination of bacteria, yeast, mold, spores, and other biological contaminants like toxins and pesticides from food and non-food surfaces improving food safety and reducing food losses. HVACP is a cold plasma technology that can efficiently generate these RGS in large containers (up to 200 liters) using only a few hundred watts of electricity. Furthermore, when using air as the working gas, the cost of an atmospheric cold plasma treatment is only a few dollars per metric ton. HVACP has been shown to be very effective for microbial decontamination while having minimal impact on the organoleptic characteristics and nutritional value of the treated food. Some examples highlighted in this presentation will include the removal of mold and aflatoxin from peanuts, doubling the shelf-life of strawberries, improving the safety and shelf-life of fresh cheese, and elimination of viruses, such as Covid-19, from imported shrimp. Additionally, pilot scale examples of HVACP treatment prototypes for fresh fruits and vegetables will be presented along with cost information.

### **Keyword-1**

cold plasma

### **Keyword-2**

food safety

### **Keyword-3**

food quality

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