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Combining technologies for food decontamination and extending the shelf life of fruit and vegetables

Providing consumers with safe food with sufficient shelf-life remains a critical challenge for the food industry. Food poisoning remains a significant problem worldwide and costs the USA alone an estimated $152B and kills 5000 people per year. Globally, between 1.2-2 Billion tons of food produced each year is wasted, in part due to limited shelf-life. A range of systems have been designed, built and evaluated at the University of Glasgow, UK, utilizing a diverse range of technologies; from lasers, microwaves, ultrasonic, pulsed light, UV, and chemical methods. These technologies have been combined to reduce levels of contamination on different produce and extend their shelf-life. Some specific examples of these different treatments and systems will be given.

Biography

Ian Watson's first degree was in applied physics, followed by a PhD from the engineering Faculty at the University of Glasgow in "Optimizing the gaseous discharge and optical coupling of a pulsed CO2 laser" which was specifically designed for material processing of reflective and refractory materials. In the early 1990s he began to research the effects of high power laser beams on microorganisms and laser sterilization and inactivation. He has published on the direct effect of a range of lasers and their efficacy on treating different substrates, including solids, liquids and air and a range of microorganisms from *E. coli* to *B. globigii*, an anthrax simulant. As well as building lasers and laser scanning inactivation systems he has developed combined systems for decontamination and inactivation applications. These systems comprised: lasers, UV, pulsed flash lamp systems, microwave and chemical treatments. Laser and plasma systems have been specifically designed, fabricated and successfully tested for treating air.

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