FOOD DISINFECTION SYSTEM USING ULTRAVIOLET GERMICIDAL RADIATION

PATENTED TECHNOLOGY

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ABSTRACT

A research group at the University of Alicante has recently developed the technology for the use of ultraviolet (UV) germicidal radiation in the disinfection of foods. Disinfection of liquid foods such as milk and fruit juices is usually carried out by means of thermal treatments or by using chemicals. The formers often induce changes in the organoleptic properties as well as in the nutrient value of the food whereas the latters may lead to the presence of non-desired by-products or residues in the treated products.

The developed technology is based on the irradiation of food, and food ingredients with UV radiation in the germicidal wavelength range (i.e. 200-300 nm) using low-cost instrumentation. This is a clean treatment that allows the elimination of pathogens present in food without comprising its quality. Researchers have been working with different UV sources and instrumental designs in order to optimize the results for different foods such as vegetable milks and grape juice.

ADVANTAGES AND INNOVATIVE ASPECTS

ADVANTAGES

- Low cost technology.
- Chemicals are not used and hence no chemical by-products are generated in the finished product.
- Disinfected materials are not heated.
- Uses non-ionizing radiation hence not residual radioactivity is delivered to the product.
- Effective to remove most microorganisms.
- Can be used for liquid and solid materials.
- Quality characteristics are preserved.
- UV-C radiation sources are easily available at a reduced cost.
- Light Emitting Diode (LED) technology can also be used with a considerable reduction of the environmental impact of the technique.
- Low energy needs.
- Combination with a less aggressive thermal treatment can be also easily implemented.

INNOVATIVE ASPECTS

- Non transparent liquid foods, having low UV radiation penetaration depth, are fully sterilized.
- It is an alternative to thermal processes because it provides similar results being less aggressive to the product characteristics.
- Superficial disinfection of solid surfaces can be accomplished.
- Low cost and effective technology.

• UV disinfection can be implemented anyway in the production process.

MARKET APPLICATIONS

All types of food processing industry. In addition, this technology can be used in any process requiring a stage of microbiological disinfection such as in water treatment or in the sterilization of medical supplies.

Application of ultraviolet light can also be an alternative option to the usual use of sulphites for the control of microorganisms in wine production.

COLLABORATION SOUGHT

Companies interested in incorporating this technology for industrial applications. This research group provides advice on the possibilities provided by this technology in the manufacturing process. Research project proposals are also welcome.