Title Sterilization of fresh produce by the combined use of slightly acidic hypochlorous water and sucrose fatty acid ester

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Abstract

Introduction: Fresh produce has become one of the most desirable foods because consumers perceive it as being healthy, tasty, and convenient. Demand for fresh, minimally processed vegetables has led to an increase in the quantity and the variety of products available to the consumer. Pathogenic bacteria can contaminate raw agricultural commodities through various pathways therefore there is need for effective sterilization of fresh produce. This paper focuses on study on control of pathogens on fresh lettuce. **Materials and Methods:** Biochemical tests, and RiboPrinter® system (DuPont Qualicon™) analyses were carried out to identify the microflorra of lettuce of culturable cells. To establish an effective sterilization condition of lettuce by slightly acidic hypochlorous water (SAHW) and to envestigate the bactericidal effect of SAHW in combination with sucrose fatty acid ester and microbubble, viable counts of lettuce were determined by the plating method using TSA after the treatments and storage at 6°C. **Results and Discussion:** The effective treatment condition of SAHW for sterilization of lettuce was 30 ppm of available chlorine for 5 min at 50°C. Treatment of lettuce at 50°C also delayed browning after 5-6 days of subsequent storage at 6°C. Two commercially available sucrose fatty acid ester (monoester-P, shokusen-SE) under microbubble generation were tested respectively for pretreatment of lettuce before final treatment by SAHW. Monoester-P showed a higher efficacy than shokusen-SE. Viable counts of microflora were decreased by about 2-3 logs after the combined sequential treatment. Of 74 bacterial isolates from fresh lettuce, 82% were Pseudomonas sp., 7% Rhizobium sp., and 5% Microbacterium sp. After pretreatment with monoester-P under microbubble generation and subsequent treatment with SAHW at 50°C for 5 min, predominant Pseudomonas sp. Decreased drastically. These results indicate the effectiveness of the combined treatments of sucrose fatty acid ester under microbubble generation and SAHW for sterilization of fresh produce.