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Kinetics model of microbial degradation by UV radiation and shelf life of coconut water

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Abstract

11 The aim of this present study was to investigate the effect of UV radiation on microbial
12 inactivation kinetic, quality and shelf life of coconut water. Zero-order and first-order kinetic
13 models were used to investigate microbial degradation (*Escherichia coli* O157:H7,
14 *Staphylococcus aureus*, *Salmonella* Enteritidis, and *Lactobacillus plantarum*) by UV
15 radiation (0.0, 0.2, 0.4, 0.8, 1.6, 3.2, 4.8, 8.0 and 12.0 J/mL). UV dose of 1.6, 3.2 and 4.8
16 J/mL was applied to investigate the effect of UV radiation on physical properties (pH, °Brix,
17 color and turbidity), chemical properties (total phenolic compound and polyphenoloxidase) of
18 coconut water and to investigate the shelf life of coconut water by determination of pink
19 discoloration, aerobic plate count, and yeast and mold count during cold storage at 4 °C for 18
20 days compared to pasteurized sample (95 °C 100 seconds). Results showed that microbial
21 inactivation of all bacteria tested in this study followed first-order kinetic model according to
22 higher coefficient of determination (0.9115-0.9656). *E. coli* O157:H7 was found to be the
23 most sensitive bacteria to UV radiation with regard to highest population reduction in

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