

Title Variation of microbial load and visual quality of ready-to-eat salads by vegetable type, season, processor and retailer

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Citation Food Microbiology, Volume 27, Issue 8, December 2010, Pages 1071-1077

Keywords Ready-to-eat salads; *E. coli*; *Salmonella*; *Listeria monocytogenes*; Microbial components; Visual quality

Abstract

Microbial components and visual quality were determined on 1158 consumer units of ready-to-eat salads from several processors, two per each of 579 process lots, with residual shelf-life varying around a mode of five days, collected over 19 months in the years 2006–2008 from retail stores of two Italian cities close to a major producing and processing area. The salads were mainly baby leaf of single species (lettuce, arugula, spinach, lamb's lettuce), with approximately 10% of the lots made up by mixes of 2–4 species. One unit per lot was analyzed on the day of collection and the other at the consume-by date. No *Salmonella* or *Listeria monocytogenes* was found (detection limit: presence in 25 g). *Escherichia coli* was detected in 27% of the lots (detection limit: 5 cfu/g), with probability of occurrence and counts highest in Autumn and for lettuce and arugula. Average visual quality was higher and other components of the microbial load were lower in Winter and Spring compared to Summer and Autumn (–0.6 log cfu/g of total aerobic counts, –1.3 log cfu/g of coliforms, –0.6 log cfu/g of yeasts and moulds). Lactic acid bacteria were detected more frequently in Spring and Summer (up to 50% of the lots). The rate of increase of microbial populations during shelf life was not affected by the level of initial contamination. At the consume-by date total aerobic count exceeded 7.2 log cfu/g for 50% of the lots and 7.7 log cfu/g for 25%. Salads from the biggest processor and retailer showed slightly higher visual quality scores, lower odds of *E. coli* occurrence and lower microbial loads. Visual quality scores showed significant negative relationships with the levels of lactic acid bacteria, coliforms and total viable counts.