

Title Modified-atmosphere and modified-humidity packaging of whole and lightly processed cucurbit commodities: melons, cucumbers, squash

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### **Abstract**

Trials were conducted on modified atmosphere (MA) and modified humidity packaging of cucurbit commodities mainly, but not exclusively, based on the application of Xtend packages (which possess enhanced water vapour permeability and permit the achievement of MA without moisture condensation). The produce was packaged in cartons and lined with microperforated Xtend plastic liners (bag-in-box package type), which were tightly closed. The produce was stored for 2 days at 10-11 or 6-7 deg C (both at 80-90% RH) plus the additional 3 days at 20 deg C and 60-70% RH, simulating retail marketing. Fresh-cut Galia-type melons were prepared and products (melon chunks) were stored in two package types (250-g retail trays and 2-kg transportation bulk packages). The packages were filled either with optimal gas mixture defined in preliminary experiments (active MA packaging) or with air (control). The packages were stored at 1, 5 or 8 deg C for 10 days followed by one day at 7-8 deg C to simulate distribution/marketing conditions. MA packaging extended the postharvest life of Charentais-type melons by delaying over-ripening, in spite of the high in-package ethylene concentration (120 micro l/litre). MA packaging of lightly processed Galia melons inhibited physiological and microbiological spoilage of fresh-cut produce. In contrast to literature recommendations, parthenocarpic Beit-Alpha-type cucumbers responded favourably to MA with up to 8-9 kPa CO<sub>2</sub>, showing alleviated physiological disorders and reduced decay. However, the CO<sub>2</sub> levels above 10 kPa were injurious. Combination of optimal atmosphere composition and humidity inhibited the cucumber toughening and preserved its tender texture and turgidity. MA packaging (both polyethylene and Xtend liners) inhibited senescence of summer squash [*Cucurbita pepo*] of zucchini and cocozelle types. The decay incidence inside Xtend packages was five times as low as in polyethylene liners.