**Title** Effects of superatmospheric oxygen levels on physico-chemical characteristics and microbial stability of minimally processed honeydew melon

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**Abstract**

This study was undertaken to determine the possibility of superatmospheric oxygen levels in maintaining quality and safety of minimally processed honey dew melon. The fresh cut samples were packed in non-perforated biaxially oriented polypropylene (BOPP), while gas containing different concentration of $O_2$ at superatmospheric level namely 40,60, 80 kPa $O_2$ (balance $N_2$) and 100 kPa $O_2$ was flushed into the packs Fruits packed in passively modified atmosphere by using non-perforated LDPE bags serve as control. Changes in headspace gas composition, appearance, firmness, polyphenol oxidase (PPO) activity, electrolyte leakage percentage (EL %) as well as several chemical and microbial parameters were evaluated throughout 3 weeks of storage at 2 0c. Regardless of storage period, superatmospheric $O_2$ levels significantly influenced L * value, whiteness index, pH, TT A, electrolyte leakage and total plate count. All the superatmospheric $O_2$ levels treatments recorded higher IT A value compared to control, which could be hypothesized that respiration rate was slowed down under the superatmospheric condition. Increased $O_2$ concentrations around certain commodity may result in accumulation of injurious free radicals that can damage plant cellular membrane system. However, in these treated samples, the membrane cell integrity was better than in the control, which indicated by lower EL %. Only treatment with 100 kpa $O_2$ demonstrated antimicrobial effect by significantly reduced growth of mesophilic aerobic bacteria. The superatmospheric $O_2$ treatments resulted in lower L * value and higher PPO activity, but there was no surface browning could be visually observed on all fruits. Total soluble solid, vitamin C content and firmness of fruits were not significantly influenced by the treatments. These results suggest that superatmospheric oxygen levels could maintain quality and microbial stability of honeydew melon during storage better than its control counterpart without accelerating respiration rate and deteriorating cellular membrane system.