

**Title** Marketable quality and phytonutrient concentrations of a novel hybrid muskmelon intended for the fresh-cut industry and its parental lines: Whole-fruit comparisons at harvest and following long-term storage at 1 or 5 °C

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### Abstract

Year-round demand for fresh-cut produce, such as muskmelon (*Cucumis melo* L. Reticulatus group) fruit, can include importation of whole-fruit from as far away as Chile, requiring expensive air shipments. Surface shipments would reduce these transportation expenses but would also require a longer shelf-life fruit than what is now commercially available to withstand the shipping/storage time frame of up to 5 weeks prior to fresh-cut processing. Current muskmelon cultivars have a fruit storage life of up to 2 weeks. In this 2-year study, we compared the marketable quality and phytonutrient attributes of a novel hybrid with its muskmelon parental lines (ultra-firm female  $\times$  commercial muskmelon cultivar type male) up to 5 weeks at 1 or 5 °C. At harvest whole hybrid fruit were larger (33–37% heavier) than its parental lines, and had an external firmness equal to its female parent. The external and internal firmnesses of the female parent were on average 4.5-fold and 3.6-fold firmer, respectively, than those of the male parent. Compared to its male parent, the internal tissue of hybrid fruit was relatively sweeter, more intensely orange, had a higher concentration of  $\beta$ -carotene, had a seven-fold higher concentration of 5-methyltetrahydrofolate (folic acid), had fewer internal disorders, and reduced senescence. The aforementioned tissue firmness of hybrid fruit would make it highly suitable to withstand surface shipments of up to 5 weeks; and the aforementioned quality characteristics would make it likely preferable to consumers both taste-wise and nutritionally as a fresh-cut product.