

# Determining cantaloupe sizes by volume:weight relationships

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Visual sizing of cantaloupes for commercial marketing results in considerable variation among melons within packed shipping containers. This situation causes losses to retail grocers, who must pay for the additional labor needed to differentially price the various sized melons—and to sustain losses from the sale of undersized melons within packs. Attempts to measure cantaloupe volumes by diameters have not proved satisfactory. Results of this study of cantaloupe volume: weight relationships conducted during 1965–67 indicated that fruit weights could serve as an accurate measure of volume.

This correlation was determined in a series of volume: weight relationship studies during the 1965, '66, and '67 seasons for PMR-45, the most commonly grown variety in California; for several commercial varieties grown under comparable conditions in a variety test plot at the University of California's West Side Field Station, and for Top Mark, a recently introduced commercial variety grown in the Imperial and San Joaquin valleys.

TABLE 1. MEAN DENSITY VALUES AND CORRELATION COEFFICIENTS OF VOLUME: WEIGHT RELATIONSHIPS FOR PMR-45 VARIETY

Year	Location	$\bar{x}$ Density (D)	Volume: Weight Correlation Coefficient (r)
1965	Davis	.91	.983
1966	Davis	.89	.986
1967	Five Points	.93	.997
	Firebaugh	.94	.991

TABLE 2. EFFECT OF POSTHARVEST DELAY ON CANTALOUPE DENSITY AND VOLUME: WEIGHT CORRELATION COEFFICIENTS

Postharvest Delay Period	$\bar{x}$ Density	Volume: Weight Correlation Coefficient (r)
hours		
1	.94	.814
4	.94	.991
7	.94	.993
9	.94	.997

TABLE 3. MEAN DENSITIES AND VOLUME: WEIGHT CORRELATION COEFFICIENTS FOR SEVERAL COMMERCIAL CANTALOUPE VARIETIES GROWN IN CALIFORNIA DURING 1967

Variety	Location	$\bar{x}$ Density	Volume: Weight Correlation Coefficient (r)
Top Mark	Imperial Valley	.96	.987
	Five Points	.95	.989
Perletta	Five Points	.88	.991
Jacumba	Five Points	.94	.995
Campo	Five Points	.93	.996
PMR-45	Five Points	.93	.997
Golden Gate-45	Five Points	.95	.998

DURING THE 1965 study, cantaloupes were weighed individually and volumes determined by water displacement. This method was too time consuming to facilitate measuring the volumes of enough melons for an accurate measure of the variability of the volume: weight relationships. During the 1966 and 1967 studies, a faster, but equally accurate, method was used in which each cantaloupe's volume was determined by subtracting its weight when submerged in water from its previously measured dry weight. The accuracy of this method was confirmed in a comparison of the two methods during the 1966 season.

Overall density values and correlation coefficients (volume: weight) for PMR-45 cantaloupes grown at three locations during different years are shown in table 1.

The distribution of density values for PMR-45 cantaloupes harvested at three commercial maturities (Hard Ripe, Eastern Choice, and Western Choice) at Davis during 1965 is shown in graph 1. Volume: weight correlation coefficients are also shown.

The effect of postharvest delays before measuring the weights and volumes of PMR-45 variety cantaloupes was also determined. Mean density values and volume: weight correlation coefficients for melons held one, four, seven and nine hours after harvest before weighing (dry and wet) are shown in table 2.

Densities and volume: weight correlation coefficients for several commercial varieties, and for the Top Mark variety, grown in the Imperial and San Joaquin valleys, are presented in table 3.

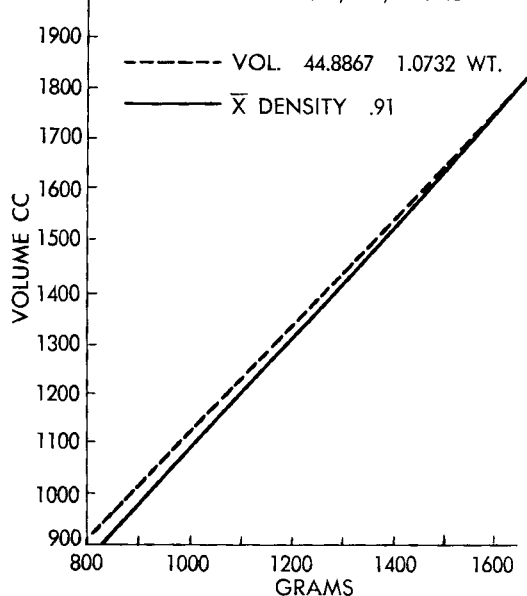
Theoretical upper and lower volume and weight limits for cantaloupes having a density of 0.9, of four commercial sizes (23's, 27's, 36's and 45's) and two proposed sizes (32's and 41's) are shown in graph 2.

The lower limit represents the mean volume and weight of melons that would make a level-packed crate of 70 to 72 lbs net weight. The upper limits represent mean volumes and weights of melons that would make a moderately bulge-packed crate of 80 to 82 lbs net weight.

Based upon the consistent volume: weight correlation coefficients, cantaloupe weight was found to be an accurate means for measuring volume. Very strong correlations were found for three commercial maturities of PMR-45, for a single variety grown in four districts, and several varieties grown under comparable conditions.

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PMR-45 CANTALOUPE VOL: WT. RELATIONSHIP 1965 SEASON, UC, DAVIS



VOLUME: WEIGHT RELATIONSHIPS OF CANTALOUPE WITH A  $\bar{x}$  DENSITY = .9

