

# PROPERTIES AND RECOMMENDED CONDITIONS FOR LONG-TERM STORAGE OF FRESH FRUITS AND VEGETABLES

Listed alphabetically according to common name

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Common name	Scientific name	Storage temperature		Relative humidity %	Highest freezing temperature		Ethylene* production	Ethylene** sensitivity	Approximate storage-life	Observations and beneficial CA conditions
		°C	°F		°C	°F				
Acerola; Barbados cherry	<i>Malpighia glabra</i>	0	32	85-90	-1.4	29.4			6-8 weeks	
African horned melon; Kiwano	<i>Cucumis metuliferus</i>	13-15	55-59	90			L	M	3-6 months	
Amaranth; Pigweed	<i>Amaranthus spp.</i>	0-2	32-36	95-100			VL	M	10-14 days	
Anise; Fennel	<i>Foeniculum vulgare</i>	0-2	32-36	90-95	-1.1	30.0			2-3 weeks	
Apple	<i>Malus pumila</i>									2-3% O2 + 1-2% CO2
not chilling sensitive		-1.1-0	30-32	90-95	-1.5	29.3	VH	H	3-6 months	
chilling sensitive	Yellow Newtown, Grimes Golden, McIntosh,	4	40	90-95	-1.5	29.3	VH	H	1-2 months	
Apricot	<i>Prunus armeniaca</i>	-0.5-0	31-32	90-95	-1.1	30.0	M	M	1-3 weeks	2-3% O2 + 2-3% CO2
Artichoke										
Globe artichoke	<i>Cynara scolymus</i>	0	32	95-100	-1.2	29.9	VL	L	2-3 weeks	2-3% O2 + 3-5% CO2
Chinese artichoke	<i>Stachys affinis</i>	0	32	90-95			VL	VL	1-2 weeks	
Jerusalem artichoke	<i>Helianthus tuberosus</i>	-0.5-0	31-32	90-95	-2.5	27.5	VL	L	4 months	
Arugula	<i>Erica vesicaria</i> var. <i>sativa</i>	0	32	95-100			VL	H	7-10 days	
Asian pear, Nashi	<i>Pyrus serotina</i> ; <i>P. pyrifolia</i>	1	34	90-95	-1.6	29.1	H	H	4-6 months	
Asparagus, green, white	<i>Asparagus officinalis</i>	2.5	36	95-100	-0.6	31.0	VL	M	2-3 weeks	5-12% CO2 in air
Atemoya	<i>Annona squamosa</i> x <i>A. cherimola</i>	13	55	85-90			H	H	2-4 weeks	3-5% O2 + 5-10% CO2
Avocado	<i>Persea americana</i>									
cv Fuerte, Hass		3-7	37-45	85-90	-1.6	29.1	H	H	2-4 weeks	2-5% O2 + 3-10% CO2
cv. Fuchs, Pollock		13	55	85-90	-0.9	30.4	H	H	2 weeks	
cv. Lula, Booth		4	40	90-95	-0.9	30.4	H	H	4-8 weeks	
Babaco, Mt. papaya	<i>Carica candamarcensis</i>	7	45	85-90					1-3 weeks	
Banana	<i>Musa paradisiaca</i> var. <i>sapientum</i>	13-15	55-59	90-95	-0.8	30.6	M	H	1-4 weeks	2-5% O2 + 2-5% CO2
Barbados cherry	see Acerola									
Beans										
Snap; Wax; Green	<i>Phaseolus vulgaris</i>	4-7	40-45	95	-0.7	30.7	L	M	7-10 days	2-3% O2 + 4-7% CO2
Fava, Broad beans	<i>Vicia faba</i>	0	32	90-95					1-2 weeks	
Lima beans	<i>Phaseolus lunatus</i>	5-6	41-43	95	-0.6	31.0	L	M	5-7 days	
Winged bean	<i>Psophocarpus tetragonolobus</i>	10	50	90					4 weeks	
Long bean; Yard-long	<i>Vigna sesquipedalis</i>	4-7	40-45	90-95			L	M	7-10 days	

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Beet, bunched	<i>Beta vulgaris</i>	0	32	98-100	-0.4	31.3	VL	L	10-14 days	
beet, topped		0	32	98-100	-0.9	30.3	VL	L	4 months	
Berries										
Blackberries	<i>Rubus spp.</i>	-0.5-0	31-32	90-95	-0.8	30.6	L	L	3-6 days	5-10% O2 + 15-20% CO2
Blueberries	<i>Vaccinium corymbosum</i>	-0.5-0	31-32	90-95	-1.3	29.7	L	L	10-18 days	2-5% O2 + 12-20% CO2
Cranberry	<i>Vaccinium macrocarpon</i>	2-5	35-41	90-95	-0.9	30.4	L	L	8-16 weeks	1-2% O2 + 0-5% CO2
Dewberry	<i>Rubus spp.</i>	-0.5-0	31-32	90-95	-1.3	29.7	L	L	2-3 days	
Elderberry	<i>Rubus spp.</i>	-0.5-0	31-32	90-95	-1.1	30.0	L	L	5-14 days	
Loganberry	<i>Rubus spp.</i>	-0.5-0	31-32	90-95	-1.7	28.9	L	L	2-3 days	
Raspberries	<i>Rubus idaeus</i>	-0.5-0	31-32	90-95	-0.9	30.4	L	L	3-6 days	5-10% O2 + 15-20% CO2
Strawberry	<i>Fragaria spp.</i>	0	32	90-95	-0.8	30.6	L	L	7-10 days	5-10% O2 + 15-20% CO2
Bittermelon; Bitter melon	<i>Momordica charantia</i>	10-12	50-54	85-90			L	M	2-3 weeks	2-3%O2 + 5% CO2
Black salsify; Scorzonera	<i>Scorzonera hispanica</i>	0-1	32-34	95-98			VL	L	6 months	
Bok choy	<i>Brassica chinensis</i>	0	32	95-100			VL	H	3 weeks	
Breadfruit	<i>Artocarpus altilis</i>	13-15	55-59	85-90					2-4 weeks	
Broccoli	<i>B. oleracea</i> var. <i>Italica</i>	0	32	95-100	-0.6	31.0	VL	H	10-14 days	1-2% O2 + 5-10% CO2
Brussels sprouts	<i>Brassica oleracea</i> var. <i>Gemifera</i>	0	32	95-100	-0.8	30.5	VL	H	3-5 weeks	1-2% O2 + 5-7% CO2
Cabbage										
Chinese; Napa	<i>Brassica campestris</i> var. <i>Pekinensis</i>	0	32	95-100	-0.9	30.4	VL	M-H	2-3 months	1-2% O2 + 0-5% CO2
Common, early crop	<i>B. oleracea</i> var. <i>Capitata</i>	0	32	98-100	-0.9	30.4	VL	H	3-6 weeks	
late crop	"	0	32	95-100	-0.9	30.4	VL	H	5-6 months	3-5% O2 + 3-7% CO2
Cactus pads or stems, Nopalitos	<i>Opuntia spp.</i>	5-10	41-50	90-95			VL	M	2-3 weeks	
Cactus fruit; Prickly pear fruit	<i>Opuntia spp.</i>	5	41	85-90	-1.8	28.7	VL	M	2-6 weeks	2%O2 +2-5%CO2
Caimito	see Sapotes									
Calamondin	see Citrus									
Canistel	see Sapotes									
Carambola, Starfruit	<i>Averrhoa carambola</i>	9-10	48-50	85-90	-1.2	29.8			3-4 weeks	
Carrots, topped	<i>Daucus carota</i>	0	32	98-100	-1.4	29.5	VL	H	3-6 months	no CA benefit; ethylene causes bitterness
bunched; immature	"	0	32	98-100	-1.4	29.5	VL	H	10-14 days	ethylene causes bitterness
Cashew apple	<i>Anacardium occidentale</i>	0-2	32-36	85-90					5 weeks	
Cassava, Yucca, Manioc	<i>Manihot esculenta</i>	0-5	32-41	85-90			VL	L	1-2 months	no CA benefit
Cauliflower	<i>Brassica oleracea</i> var. <i>Botrytis</i>	0	32	95-98	-0.8	30.6	VL	H	3-4 weeks	2-5% O2 + 2-5% CO2

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Celeriac	<i>Apium graveolens</i> var. <i>Rapaceum Dulce</i>	0	32	98-100	-0.9	30.4	VL	L	6-8 months	2-4%O2 + 2-3%CO2
Celery	<i>Apium graveolens</i> var. <i>Dulce</i>	0	32	98-100	-0.5	31.1	VL	M	1-2 months	1-4%O2 + 3-5%CO2
Chard	<i>Beta vulgaris</i> var. <i>Cicla</i>	0	32	95-100			VL	H	10-14 days	
Chayote	<i>Sechium edule</i>	7	45	85-90					4-6 weeks	
Cherimoya; Custard apple	<i>Annona cherimola</i>	13	55	90-95	-2.2	28.0	H	H	2-4 weeks	3-5% O2 + 5-10% CO2
Cherries, sour	<i>Prunus cerasus</i>	0	32	90-95	-1.7	29.0	VL	L	3-7 days	3-10% O2 + 10-12% CO2
Cherries, sweet	<i>Prunus avium</i>	-1 to 0	30-32	90-95	-2.1	28.2	VL	L	2-3 weeks	10-20% O2 + 20-25% CO2
Chicory	see Endive									
Chiles	see Pepper									
Chinese broccoli; Gai lan	<i>Brassica alboglabra</i>	0	32	95-100			VL	H	10-14 days	
Chinese date	See Jujube									
Chives	<i>Allium schoenoprasum</i>	0	32	95-100			VL	H	2-3 weeks	5-10%O2 + 5-10% CO2
Cilantro, Chinese parsley	See Herbs									
Citrus										
Calamondin orange	<i>Citrus reticulata</i> x <i>Fortunella</i> spp.	9-10	48-50	90	-2.0	28.3			2 weeks	
Grapefruit	<i>Citrus paradisi</i>									3-10% O2 + 5-10% CO2
CA, AZ, dry areas		14-15	58-59	85-90	-1.1	30.0	VL	M	6-8 weeks	
FL, humid areas		10-15	50-59	85-90	-1.1	30.0	VL	M	6-8 weeks	
Kumquat	<i>Fortunella japonica</i>	4	40	90-95			VL	M	2-4 weeks	
Lemon	<i>Citrus limon</i>	10-13	50-55	85-90	-1.4	29.4			1-6 months	5-10%O2 + 0-10%CO2
Lime, Mexican, Tahiti or Persian	<i>Citrus aurantifolia</i> ; <i>C. latifolia</i>	9-10	48-50	85-90	-1.6	29.1			6-8 weeks	5-10%O2 + 0-10%CO2
Orange	<i>Citrus sinensis</i>									5-10% O2 + 0-5% CO2
CA, AZ, dry areas		3-9	38-48	85-90	-0.8	30.6	VL	M	3-8 weeks	
FL; humid regions		0-2	32-36	85-90	-0.8	30.6	VL	M	8-12 weeks	
Blood orange		4-7	40-44	90-95	-0.8	30.6			3-8 weeks	
Seville; Sour	<i>Citrus aurantium</i>	10	50	85-90	-0.8	30.6	L	M	12 weeks	
Pummelo	<i>Citrus grandis</i>	7-9	45-48	85-90	-1.6	29.1			12 weeks	
Tangelo, Minneola	<i>C. reticulata</i> x <i>paradisi</i>	7-10	45-50	85-95	-0.9	30.3			2-4 weeks	
Tangerine, Mandarin	<i>Citrus reticulata</i>	4-7	40-45	90-95	-1.1	30.1	VL	M	2-4 weeks	
Coconut	<i>Cocos nucifera</i>	0-2	32-36	80-85	-0.9	30.4			1-2 months	
Collards	<i>B. oleracea</i> var. <i>Acephala</i>	0	32	95-100	-0.5	31.1	VL	H	10-14 days	
Corn, sweet and baby	<i>Zea mays</i>	0	32	95-98	-0.6	30.9	VL	L	5-8 days	2-4%O2 + 5-10%CO2; to 4 wks, 5-10%O2+15%CO2
Cowpeas	See Peas									
Cucumber, slicing	<i>Cucumis sativus</i>	10-12	50-54	85-90	-0.5	31.1	L	H	10-14 days	3-5% O2 + 0-5% CO2
pickling		4	40	95-100			L	H	7 days	3-5% O2 + 3-5% CO2

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Currants	<i>Ribes sativum</i> ; <i>R. nigrum</i> ; <i>R. rubrum</i> see Cherimoya	-0.5-0	31-32	90-95	-1.0	30.2	L	L	1-4 weeks	CA can extend storage life to 3-6 months
Custard apple	<i>Raphanus sativus</i>	0-1	32-34	95-100			VL	L	4 months	
Dasheen	see Taro									
Date	<i>Phoenix dactylifera</i>	-18-0	0-32	75	-15.7	3.7	VL	L	6-12 months	
Dill	see Herbs									
Durian	<i>Durio zibethinus</i>	4-6	39-42	85-90					6-8 weeks	3-5% O2 + 5-15% CO2
Eggplant	<i>Solanum melongena</i>	10-12	50-54	90-95	-0.8	30.6	L	M	1-2 weeks	3-5% O2 + 0% CO2
Endive, Escarole	<i>Cichorium endivia</i>	0	32	95-100	-0.1	31.7	VL	M	2-4 weeks	
Belgian endive; Witloof chicory	<i>Cichorium intybus</i>	2-3	36-38	95-98			VL	M	2-4 weeks	light causes greening; 3-4%O2 + 4-5%CO2
Epazote	See Herbs									
Fava bean	See Beans									
Feijoa, Pineapple guava	<i>Feijoa sellowiana</i>	5-10	41-50	90			M	L	2-3 weeks	
Fennel, see anise										
Fig	<i>Ficus carica</i>	-0.5-0	31-32	85-90	-2.4	27.6	M	L	7-10 days	5-10%O2 + 15-20%CO2
Garlic bulb	<i>Allium sativum</i>	-1-0	30-32	65-70	-2.0	28.4	VL	L	6-7 months	0.5%O2 + 5-10%CO2
Ginger	<i>Zingiber officinale</i>	13	55	65			VL	L	6 months	no CA benefit
Gooseberry	<i>Ribes grossularia</i>	-0.5-0	31-32	90-95	-1.1	30.0	L	L	3-4 weeks	
Granadilla	see Passionfruit									
Grape	<i>Vitis vinifera</i> a=fruit, b=stem	-0.5 - 0	31-32	90-95	-2.7 a -2.0 b	27.1 a 28.4 b	VL	L	1-6 months	2-5%O2 + 1-3%CO2; to 4 wks, 5-10%O2+10-15%CO2
American grape	<i>Vitis labrusca</i>	-1 to -0.5	30-31	90-95	-1.4	29.4	VL	L	2-8 weeks	
Grapefruit	see Citrus									
Guava	<i>Psidium guajava</i>	5-10	41-50	90			L	M	2-3 weeks	
Herbs, fresh culinary	See specific herb									
Basil	<i>Ocimum basilicum</i>	10	50	90			VL	H	7 days	5-10%O2 + 5-10%CO2
Chives	<i>Allium schoenoprasum</i>	0	32	95-100	-0.9	30.4	L	M		2%O2 + 0 to <10%CO2
Cilantro, Chinese parsley	<i>Coriandrum sativum</i>	0-1	32-34	95-100			VL	H	2 weeks	3%O2 + 7-10%CO2; air + 7-10%CO2
Dill	<i>Anethum graveolens</i>	0	32	95-100	-0.7	30.7	VL	H	1-2 weeks	5-10%O2 + 5-10% CO2
Epazote	<i>Chenopodium ambrosioides</i>	0-5	32-41	90-95			VL	M	1-2 weeks	
Mint	<i>Mentha spp.</i>	0	32	95-100			VL	H	2-3 weeks	5-10%O2 + 5-10% CO2
Oregano	<i>Origanum vulgare</i>	0-5	32-41	90-95			VL	M	1-2 weeks	
Parsley	<i>Petroselinum crispum</i>	0	32	95-100	-1.1	30.0	VL	H	1-2 months	5-10%O2 + 5-10% CO2
Perilla, Shiso	<i>Perilla frutescens</i>	10	50	95			VL	M	7 days	
Sage	<i>Salvia officinalis</i>	0	32	90-95					2-3 weeks	
Thyme	<i>Thymus vulgaris</i>	0	32	90-95					2-3 weeks	
Horserradish	<i>Armoracia rusticana</i>	-1 to 0	30-32	98-100	-1.8	28.7	VL	L	10-12 mo.	

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		°C	°F		°C	°F				
Husk tomato	see Tomatillo									
Jaboticaba	<i>Myrciaria cauliflora</i> = <i>Eugenia cauliflora</i>	13-15	55-59	90-95					2-3 days	
Jackfruit	<i>Artocarpus heterophyllus</i>	13	55	85-90			M	M	2-4 weeks	
Jerusalem artichoke	see Artichoke									
Jicama, Yambean	<i>Pachyrhizus erosus</i>	13-18	55-65	85-90			VL	L	1-2 months	
Jujube; Chinese date	<i>Ziziphus jujuba</i>	2.5-10	36-50	85-90	-1.6	29.2	L	M	1 month	
Kaki	see Persimmon									
Kale	<i>Brassica oleracea</i> var. <i>acephala</i>	0	32	95-100	-0.5	31.1	VL	H	10-14 days	
Kiwano	see African horned melon									
Kiwifruit; Chinese gooseberry	<i>Actinidia chinensis</i>	0	32	90-95	-0.9	30.4	L	H	3-5 months	1-2% O2 + 3-5% CO2
Kohlrabi	<i>Brassica oleracea</i> var. <i>Gongylodes</i>	0	32	98-100	-1.0	30.2	VL	L	2-3 months	no CA benefit
Kumquat	See Citrus									
Langsat; Lanzone	<i>Aglaia</i> sp.; <i>Lansium</i> sp.	11-14	52-58	85-90					2 weeks	
Leafy Greens										
Cool season	various genera	0	32	95-100	-0.6	31.0	VL	H	10-14 days	
Warm season	various genera	7-10	45-50	95-100	-0.6	31.0	VL	H	5-7 days	
Leek	<i>Allium porrum</i>	0	32	95-100	-0.7	30.7	VL	M	2 months	1-2% O2 + 2-5% CO2
Lemon	see Citrus									
Lettuce	<i>Lactuca sativa</i>	0	32	98-100	-0.2	31.7	VL	H	2-3 weeks	2-5% O2 + 0% CO2
Lima bean	see Beans									
Lime	see Citrus									
LoBok	see Daikon									
Longan	<i>Dimocarpus longan</i> = <i>Euphoria longan</i>	4-7	39-45	90-95	-2.4	27.7			2-4 weeks	
Long bean	See Beans									
Loquat	<i>Eriobotrya japonica</i>	0	32	90-95	-1.9	28.6			3 weeks	
Luffa; Chinese okra	<i>Luffa</i> spp.	10-12	50-54	90-95			L	M	1-2 weeks	
Lychee, Litchi	<i>Litchi chinensis</i>	1-2	34-36	90-95			M	M	3-5 weeks	3-5% O2 + 3-5% CO2
Malanga, Tania, New cocoyam	<i>Xanthosoma sagittifolium</i>	7	45	70-80			VL	L	3 months	
Mamey	see Sapote									
Mandarin	see Citrus									
Mango	<i>Mangifera indica</i>	13	55	85-90	-1.4	29.5	M	M	2-3 weeks	3-5%O2 + 5-10%CO2
Mangosteen	<i>Garcinia mangostana</i>	13	55	85-90			M	H	2-4 weeks	
Melons										
Cantaloupes and other netted melons	<i>Cucurbita melo</i> var. <i>reticulatus</i>	2-5	36-41	95	-1.2	29.9	H	M	2-3 weeks	3-5% O2 + 10-15% CO2

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Casaba	<i>Cucurbita melo</i>	7-10	45-50	85-90	-1.0	30.3	L	3-4 weeks	3-5% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Crenshaw	<i>Cucurbita melo</i>	7-10	45-50	85-90	-1.1	30.1	M	2-3 weeks	3-5% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Honeydew, and Orange-flesh	<i>Cucurbita melo</i>	5-10	41-50	85-90	-1.1	30.1	M	3-4 weeks	3-5% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Persian	<i>Cucurbita melo</i>	7-10	45-50	85-90	-0.8	30.6	M	2-3 weeks	3-5% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Mint	see Herbs								
Mombin	see Spondias								
Mushrooms	<i>Agaricus, other genera</i>	0	32	90	-0.9	30.4	VL	7-14 days	3-21%O <sub>2</sub> + 5-15%CO <sub>2</sub>
Mustard greens	<i>Brassica juncea</i>	0	32	90-95			VL	7-14 days	
Nashi	see Asian pear								
Nectarine	<i>Prunus persica</i>	-0.5-0	31-32	90-95	-0.9	30.3	M	2-4 weeks	1-2% O <sub>2</sub> + 3-5% CO <sub>2</sub> ; internal breakdown 3-10°C
Okra	<i>Abelmoschus esculentus</i>	7-10	45-50	90-95	-1.8	28.7	L	7-10 days	air + 4-10%CO <sub>2</sub>
Olives, fresh	<i>Olea europea</i>	5-10	41-50	85-90	-1.4	29.4	L	4-6 weeks	2-3% O <sub>2</sub> + 0-1% CO <sub>2</sub>
Onions	<i>Allium cepa</i>								
Mature bulbs, dry		0	32	65-70	-0.8	30.6	VL	1-8 months	1-3% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Green onions		0	32	95-100	-0.9	30.4	L	3 weeks	2-4% O <sub>2</sub> + 10-20% CO <sub>2</sub>
Orange	see Citrus								
Papaya	<i>Carica papaya</i>	7-13	45-55	85-90	-0.9	30.4	M	1-3 weeks	2-5% O <sub>2</sub> + 5-8% CO <sub>2</sub>
Parsley	see Herbs								
Parsnips	<i>Pastinaca sativa</i>	0	32	95-100	-0.9	30.4	VL	4-6 months	ethylene causes bitterness
Passionfruit	<i>Passiflora spp.</i>	10	50	85-90			VH	3-4 weeks	
Peach	<i>Prunus persica</i>	-0.5-0	31-32	90-95	-0.9	30.3	M	2-4 weeks	1-2%O <sub>2</sub> + 3-5%CO <sub>2</sub> ; internal breakdown 3-10°C
Pear, European	<i>Pyrus communis</i>	-1.5 to -0.5	29-31	90-95	-1.7	29.0	H	2-7 months	Cultivar variations; 1-3%O <sub>2</sub> + 0-5% CO <sub>2</sub>
Pear, Asian	See Asian Pear								
Peas in pods; Snow, Snap & Sugar peas	<i>Pisum sativum</i>	0	32	90-98	-0.6	30.9	VL	1-2 weeks	2-3% O <sub>2</sub> + 2-3% CO <sub>2</sub>
Southern peas; Cowpeas	<i>Vigna sinensis</i> = <i>V. unguiculata</i>	4-5	40-41	95				6-8 days	
Pepino; Melon pear	<i>Solanum muricatum</i>	5-10	41-50	95			L	4 weeks	
Peppers									
Bell Pepper, Paprika	<i>Capsicum annuum</i>	7-10	45-50	95-98	-0.7	30.7	L	2-3 weeks	2-5% O <sub>2</sub> + 2-5% CO <sub>2</sub>
Hot peppers, Chiles	<i>Capsicum annuum and C. frutescens</i>	5-10	41-50	85-95	-0.7	30.7	L	2-3 weeks	3-5% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Persimmon, Kaki	<i>Diospyros kaki</i>								3-5% O <sub>2</sub> + 5-8% CO <sub>2</sub>
Fuyu		0	32	90-95	-2.2	28.0	L	1-3 months	
Hachiya		0	32	90-95	-2.2	28.0	L	2-3 months	
Pineapple	<i>Ananas comosus</i>	7-13	45-55	85-90	-1.1	30.0	L	2-4 weeks	2-5% O <sub>2</sub> + 5-10% CO <sub>2</sub>
Plantain	<i>Musa paradisiaca</i> var. <i>paradisiaca</i>	13-15	55-59	90-95	-0.8	30.6	L	1-5 weeks	

Common name	Scientific name	Storage temperature		Relative humidity %	Highest freezing temperature		Ethylene* production	Ethylene** sensitivity	Approximate storage-life	Observations and beneficial CA conditions
		°C	°F		°C	°F				
Plums and Prunes	<i>Prunus domestica</i>	-0.5 - 0	31-32	90-95	-0.8	30.5	M	M	2-5 weeks	1-2%O2 + 0-5%CO2
Pomegranate	<i>Punica granatum</i>	5-7.2	41-45	90-95	-3.0	26.6	L	VL	2-3 months	3-5% O2 + 5-10% CO2
Potato, early crop	<i>Solanum tuberosum</i>	10-15	50-59	90-95	-0.8	30.5	M	VL	10-14 days	no CA benefit
late crop		4-8	40-46	95-98	-0.8	30.5	M	VL	5-10 months	no CA benefit
Pumpkin	<i>Cucurbita maxima</i>	12-15	54-59	50-70	-0.8	30.5	M	L	2-3 months	
Quince	<i>Cydonia oblonga</i>	-0.5-0	31-32	90	-2.0	28.4	H	L	2-3 months	
Radichio	<i>Cichorium intybus</i>	0-1	32-34	95-100					4-8 weeks	
Radish	<i>Raphanus sativus</i>	0	32	95-100	-0.7	30.7	L	VL	1-2 months	1-2%O2 + 2-3%CO2
Rambutan	<i>Nephelium lappaceum</i>	12	54	90-95			H	H	1-3 weeks	3-5% O2 + 7-12% CO2
Rhubarb	<i>Rheum rhaponticum</i>	0	32	95-100	-0.9	30.3	L	VL	2-4 weeks	
Rutabaga	<i>Brassica napus</i> var. <i>Napobrassica</i>	0	32	98-100	-1.1	30.1	L	VL	4-6 months	
Sage	see Herbs									
Salsify; Vegetable oyster	<i>Trapogon porrifolius</i>	0	32	95-98	-1.1	30.1	L	VL	2-4 months	
Sapotes										
Caimito, Star apple	<i>Chrysophyllum cainito</i>	3	38	90	-1.2	29.9			3 weeks	
Canistel, Eggfruit	<i>Pouteria campechiana</i>	13-15	55-59	85-90	-1.8	28.7			3 weeks	
Black sapote	<i>Diospyros ebenaster</i>	13-15	55-59	85-90	-2.3	27.8			2-3 weeks	
White sapote	<i>Casimiroa edulis</i>	20	68	85-90	-2.0	28.4			2-3 weeks	
Mamey sapote	<i>Calocarpum mammosum</i>	13-15	55-59	90-95			H	H	2-3 weeks	
Sapodilla, Chicosapote	<i>Achras zapota</i>	15-20	59-68	85-90			H	H	2 weeks	
Scorzonera	see Black Salsify									
Shallots	<i>Allium cepa</i> var. <i>ascalonicum</i>	0-2.5	32-36	65-70	-0.7	30.7	L	L		
Snap bean	see Beans									
Soursop	<i>Annona muricata</i>	13	55	85-90					1-2 weeks	3-5%O2 + 5-10% CO2
Spinach	<i>Spinacia oleracea</i>	0	32	95-100	-0.3	31.5	H	VL	10-14 days	5-10%O2 + 5-10%CO2
Spondias, Mombin, Wi apple, Jobo, Hogplum	<i>Spondias</i> spp.	13	55	85-90					1-2 weeks	
Sprouts from seeds	<i>various genera</i>	0	32	95-100					5-9 days	
Alfalfa sprouts	<i>Medicago sativa</i>	0	32	95-100					7 days	
Bean sprouts	<i>Phaseolus</i> sp.	0	32	95-100					7-9 days	
Radish sprouts	<i>Raphanus</i> sp.	0	32	95-100					5-7 days	
Squash										
Summer (soft rind); Courgette	<i>Cucurbita pepo</i>	7-10	45-50	95	-0.5	31.1	M	L	1-2 weeks	3-5% O2 + 5-10% CO2
Winter (hard rind); Calabash	<i>Cucurbita moschata</i> ; <i>C. maxima</i>	12-15	54-59	50-70	-0.8	30.5	M	L	2-3 months	large differences among varieties
Star-apple	see Sapotes									
Starfruit	see Carambola									
Strawberry	see Berries									

Common name	Scientific name	Storage temperature		Relative humidity %	Highest freezing temperature °C	Ethylene* production	Ethylene** sensitivity	Approximate storage-life	Observations and beneficial CA conditions
		°C	°F						
Sweetpotato, "Yam"	<i>Ipomea batatas</i>	13-15	55-59	85-95	-1.3	29.7	VL	4-7 months	
Sweetsop; Sugar apple; Custard apple	<i>Annona squamosa</i> ; <i>Annona spp.</i>	7	45	85-90			H	4 weeks	3-5% O2 + 5-10% CO2
Tamarillo, Tree tomato	<i>Cyphomandra betacea</i>	3-4	37-40	85-95			L	10 weeks	
Tamarind	<i>Tamarindus indica</i>	2-7	36-45	90-95	-3.7	25.3	VL	3-4 weeks	
Taro, Cocoyam, Eddoe, Dasheen	<i>Colocasia esculenta</i>	7-10	45-50	85-90	-0.9	30.3		4 months	No CA benefit
Thyme	see Herbs								
Tomatillo; Husk tomato	<i>Physalis ixocarpa</i>	7-13	45-55	85-90			VL	3 weeks	
Tomato, mature-green	<i>Lycopersicon esculentum</i>	10-13	50-55	90-95	-0.5	31.0	VL	2-5 weeks	3-5%O2 + 2-3%CO2
Tomato, firm-ripe		8-10	46-50	85-90	-0.5	31.1	H	1-3 weeks	3-5%O2 + 3-5%CO2
Turnip root	<i>Brassica campestris</i> var. <i>Rapifera</i>	0	32	95	-1.0	30.1	VL	4-5 months	
Water chestnut	<i>Eleocharis dulcis</i>	1-2	32-36	85-90				2-4 months	
Watercress; Garden cress	<i>Lepidium sativum</i> ; <i>Nasturtium officinales</i>	0	32	95-100	-0.3	31.5	VL	2-3 weeks	
Watermelon	<i>Citrullus vulgaris</i>	10-15	50-59	90	-0.4	31.3	VL	2-3 weeks	no CA benefit
Winged bean	See Beans								
Witloof chicory	See Endive								
Yam	<i>Dioscorea spp.</i>	15	59	70-80	-1.1	30.0	VL	2-7 months	
Yard-long bean	See Beans								
Yuca	see Cassava								

\*Ethylene production rate:

VL = very low (<0.1 µL/kg-hr at 20°C)

L = low (0.1-1.0 µL/kg-hr)

M = moderate (1.0-10.0 µL/kg-hr)

H = high (10-100 µL/kg-hr)

VH = very high (>100 µL/kg-hr)

\*\*Ethylene sensitivity (detrimental effects include yellowing, softening, increased decay, abscission or loss of leaves, browning)

L = low sensitivity

M = moderately sensitive

H = highly sensitive

Sources of information:

- Facciola, S. 1990. Cornucopia. A Source Book of Edible Plants, Kampong Publ., Vista CA. 678 pp.
- Hardenburg, R., A.E. Watada, C.Y. Wang. 1986. The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks. USDA Agric. Hdbk No. 66. 130 pp.
- Kader, A.A. et al. 1992. Postharvest Technology of Horticultural Crops. Univ. Calif. Publication 3311. 296 pp.
- Kays, S.J. and J.C. Silva Dias. 1996. Cultivated Vegetables of the World. Exon Press, Athens, GA. 170 pp.
- McGregor, B.M. 1987. Manual de Transporte de Productos Tropicales, USDA Agric. Handbook No. 668. 148 pp.
- Maersk, Sealand and APL shipping guides
- Proceedings 6<sup>th</sup> and 7<sup>th</sup> International Controlled Atmosphere Research Conferences.
- Rubatzky, V.E. and M. Yamaguchi. 1997. World Vegetables. Principles, Production and Nutritive Values. 2<sup>nd</sup> ed. Chapman & Hall, N.Y. 843 pp.
- Whiteman, T.M. 1957. Freezing points of Fruits, Vegetables, and Florist Stocks. USDA Mkt. Res. Rpt. No. 196. 32 pp.
- Unpublished data on specialty vegetables and fruits from Marita Cantwell and Adel Kader.