

# Optimal Fresh

The fruit, vegetable and fresh produce expert system



Detailed Report Printed on Wednesday, 19 December 2001

**Crop** avocado, Hass

**Maturity stage** General

**Category** Fruit

**Plant Part** Fruit

**Usage** Cooked, Fresh/ Raw,  
Salad



Picture source: Glowinski, 1991

**Botanical name** *Persea americana* var. *americana*

**Botanical family** Lauraceae

## Alternate names include

(E) Hass avocado (E) avocado, Hass

## Refrigerated Container/Coolroom Recommendations

**Optimum product storage temperature**

5.0 to 8.0°C

**Temperature set point**

5.0°C

Add a margin for uncertainty in equipment performance if necessary.  
For return air control set point add 1°C to delivery set point.

**Ventilation (air exchange) settings for containers:** 6 m (20') =

60 m<sup>3</sup>/h = 35 cfm\*

12 m (40') =

120 m<sup>3</sup>/h = 70 cfm\*

**Acceptable product temperature at loading into container**

5.0 to 10.0°C

\* Values taken from avocado.

## Key Properties

Storage time (days)†	Humidity (% RH)	Freezing point (°C)	Storage time at ambient (~20°C)	Ventilation rate
21 - 28	85 - 90	-1.6	2 - 7*	High*

† at optimum storage temperature

\* Values taken from avocado.

Storage life depends on maturity, Temperature depends on variety

## Other Properties

Ref	Maturity stage	Air exchange *	Freezing Point (°C)	Ethylene production **	Ethylene sensitivity	Ice compatibility	Water loss ***	% Water content	Bruising susceptibility
1	General		-1.6	High	High				
1#	General	High	-0.3	High	High	No	M (2.5)	76	Medium
1#	Green		-0.5	No		No			
1#	Ripe		-0.5	Yes	Yes	No			

# Values taken from avocado

\* Air exchange rates: Nil = 0%; Very low = 25%; Low = 50%; Medium = 100%; High = 200%; Very high = 400% fresh air/hour.

\*\* Ethylene production rates at 20°C: Nil = 0 nM; Very low = <4 nM; Low = 4 - 40 nM; Medium = 40 - 400 nM; High = 400 - 4000 nM; Very high =>4000 nM ethylene/kg/hour.

\*\*\* Where % weight loss/week is given this is converted as: Low <= 1%; Medium = 1.1 - 3.4%; High = >3.5%

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## Controlled Atmosphere

Ref	Maturity stage	% O2		% CO2		Temp°C		Benefit of controlled atmosphere
		min	max	min	max	min	max	
1	General	2	5	3	10	3	7	Yes Good, (+42 days)
1#	General	2	5	3	10	5	12	

# Values taken from avocado

### Reference notes

1 Large varietal differences in chilling sensitivity

## Respiration\* and Heat Transfer

Ref	Maturity stage	0°C		5°C		10°C		15°C		20°C		25°C		Specific heat kJ/kg/EC **
		min	max	min	max	min	max	min	max	min	max	min	max	
1#	General			59	88	100	200	182	462	218	1020	347	1258	3.38
1#	Ripe			53	80			160	415	195	915	310	1130	

# Values taken from avocado

\* Respiration values given are in Watts per tonne. 1 W/t = 20.4 kCal/t/d = 82.1 Btu/tn./d = 73.3 Btu/2000 lbs/d = 0.167 mL CO<sub>2</sub>/kg/h = 7.0 umol CO<sub>2</sub>/kg/h = 0.308 mg CO<sub>2</sub>/kg/h

\*\* Specific heat (kJ/kg/°C) = 0.0335 x % water content + 0.8374; Specific heat in Btu/lb/°F = 0.08 x % water content + 0.2

### Reference notes

1 0°C chilling temperature; 5°C borderline

## Compatibility in Mixed Storage

### Temperature compatibility group

0	7	13	20
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### Humidity compatibility group

Dry 60-80%	Moderate 80-90%	High 90-95%	Very high 95-100%
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Not compatible with crops that: Produce ethylene (especially when they are ripe or ripening)  
Are sensitive to ethylene

Odours will be absorbed by: Pineapples

Absorbs odours from:

### Ethylene-producing fruits and vegetables from *Optimal Fresh* database

(Medium ethylene production levels or greater.)

apple	apricot	atemoya	avocado
banana	breadfruit	cherimoya	custard apple
durian	feijoa	fig	jackfruit
jujube fruit	kiwifruit	litchi	mamey sapote
mango	mangosteen	melon, cantaloupe	melon, honeydew
nashi	nectarine	papaya	passionfruit
peach	pear	plum	rambutan
sapodilla	tomato		

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## Ethylene-sensitive fruits and vegetables from *Optimal Fresh* database

(High sensitivity.)

Chinese broccoli	Chinese cabbage	apple	apricot
asparagus	atemoya	avocado	banana
bean, French	bitter melon	bok choy	broccoli
brussels sprouts	cabbage	carrot	cauliflower
celery	cherimoya	chicory	collards
corn, sweet	cucumber	custard apple	eggplant
endive	fuzzy melon	globe artichoke	guava
kale	kiwifruit	kohlrabi	leafy greens
lemon	lettuce	litchi	long bean
mamey sapote	mandarin	mango	mangosteen
melon, cantaloupe	melon, honeydew	nashi	nectarine
okra	olive, fresh	onion, green	papaya
parsnip	passionfruit	pea, green	peach
pear	persimmon	plum	potato
pumpkin	quince	rambutan	rhubarb
sapodilla	silver beet	spinach	squash, soft rind
squash, zucchini	sweet potato	tamarillo	tomato
turnip greens	watermelon	yam	

## Seasonal Availability

Ref	Country	Region (where given)	Start Season	End Season	Start Peak	End Peak
1	Australia		June	December	-	-
1#	Australia		January	December	March	August
1#	Thailand		May	July	-	-
1#	Jamaica		July	November	-	-
1#	Chile		September	December	-	-

# Values taken from avocado

## References for avocado, Hass

Values quoted in Detailed Report are taken from a compilation of the best set of figures from all references. This best set of figures is always referred to as Reference 1.

See Reference Report for full listing of all values, original references and alternate names.