

# ***Product Considerations: Kiwifruit, Pomegranate, Strawberry***

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UCDavis*



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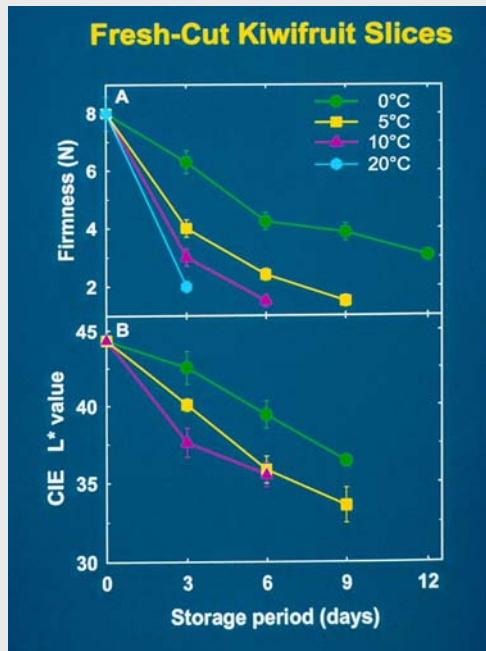
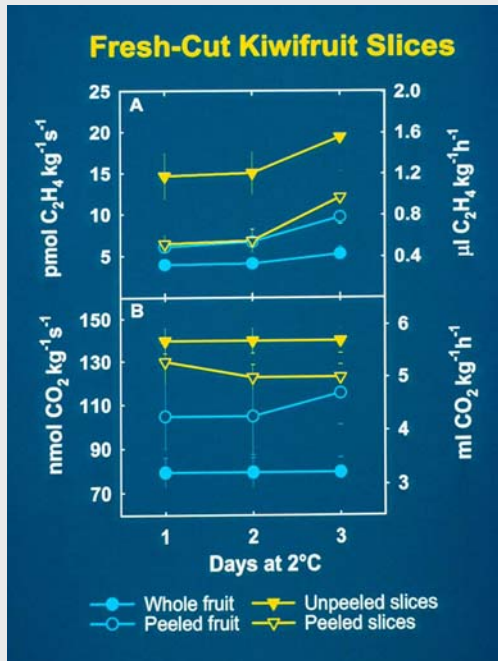
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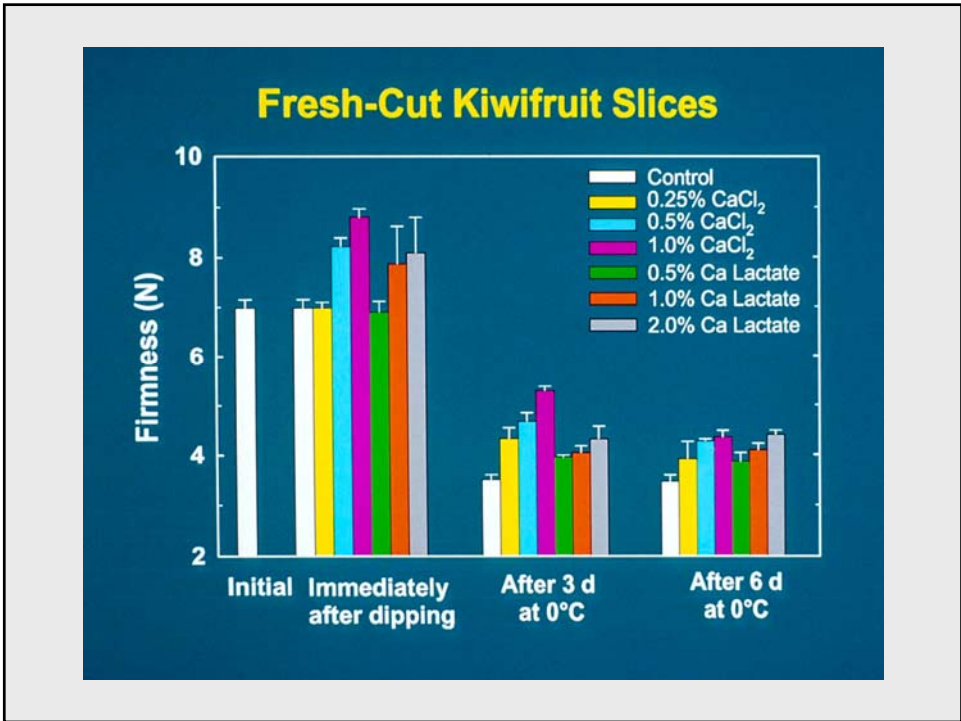
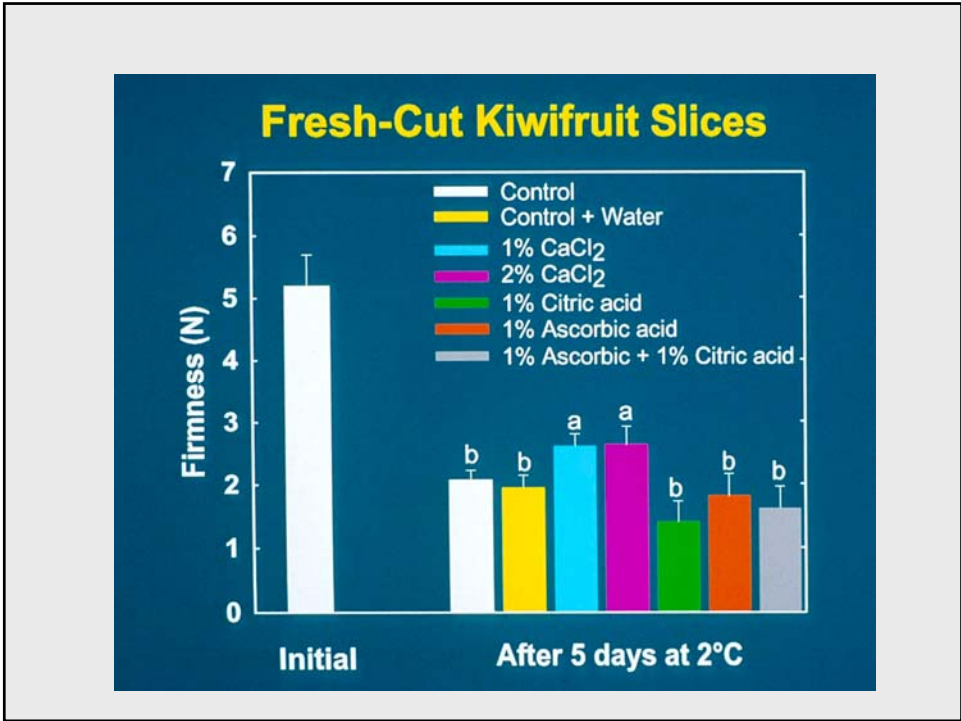
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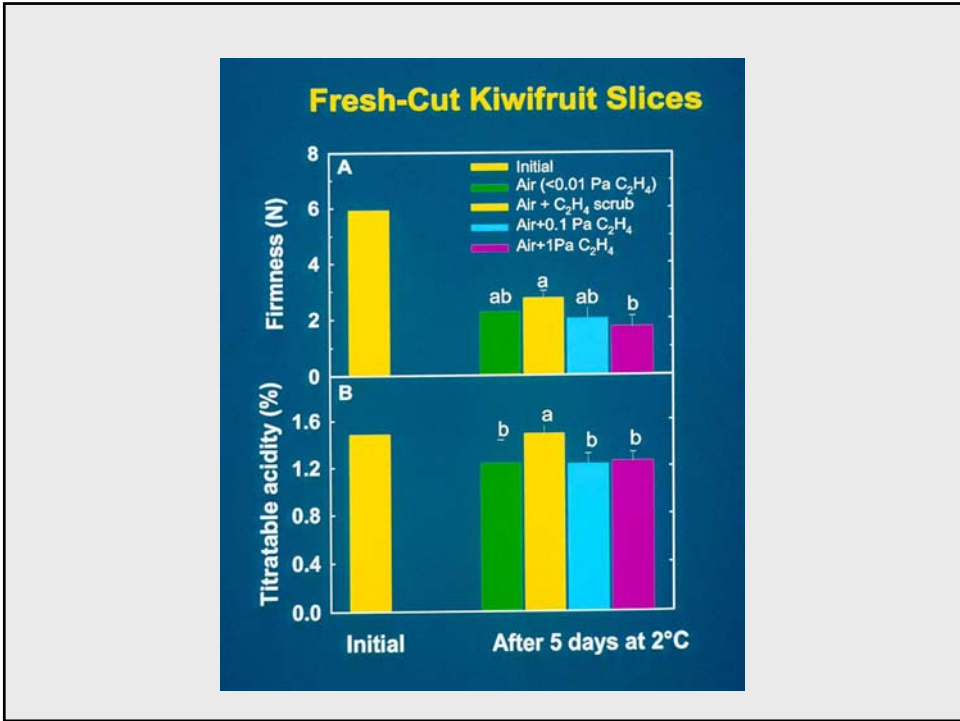
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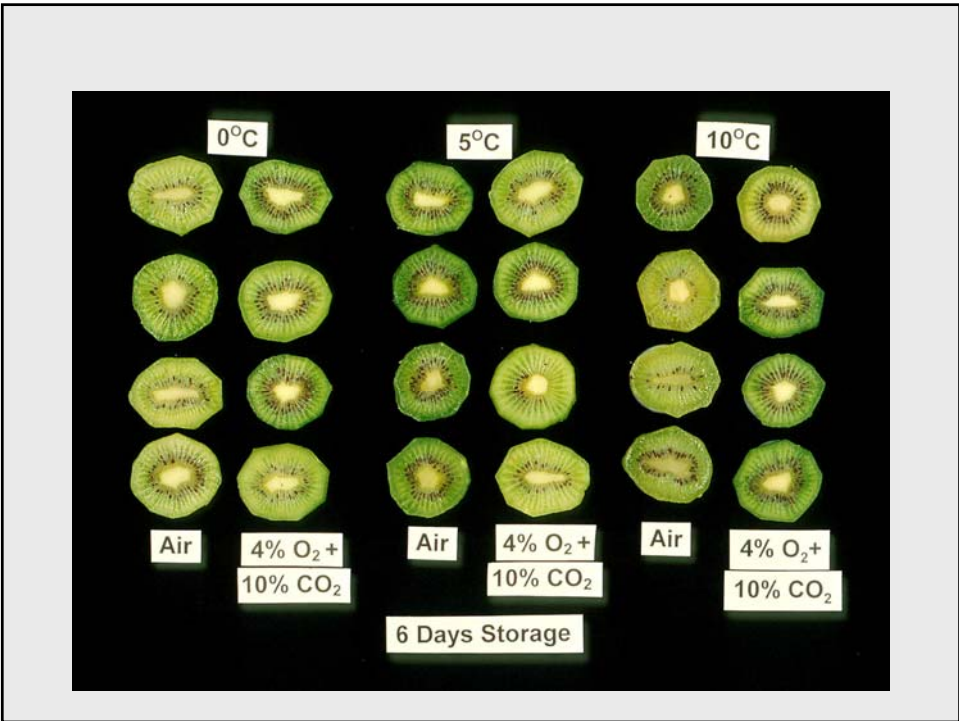
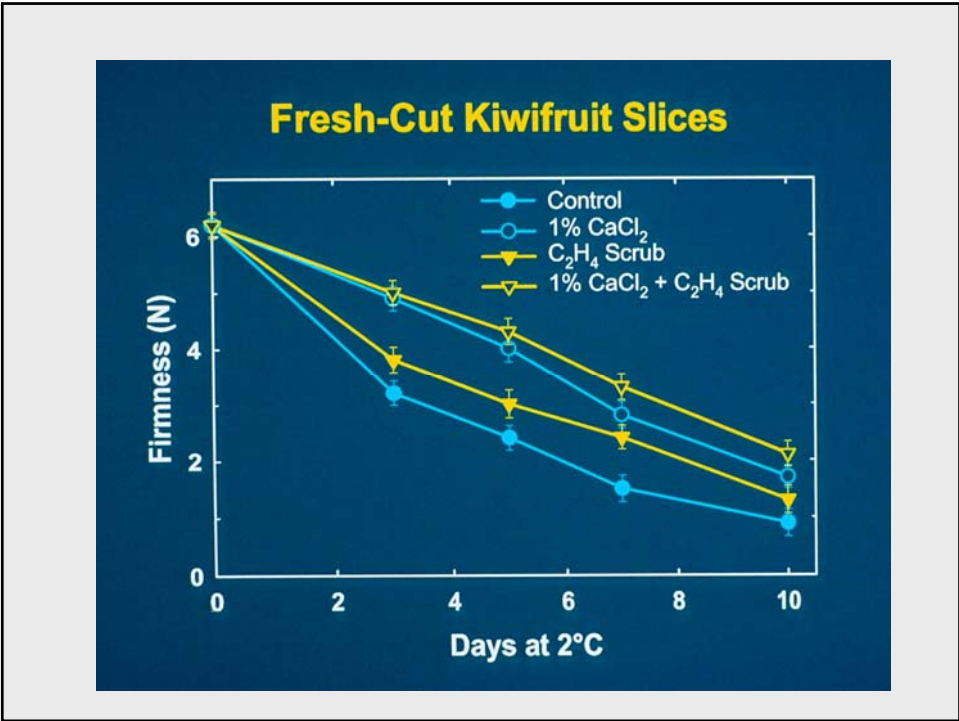
**Visual Quality Scores for Kiwifruit**

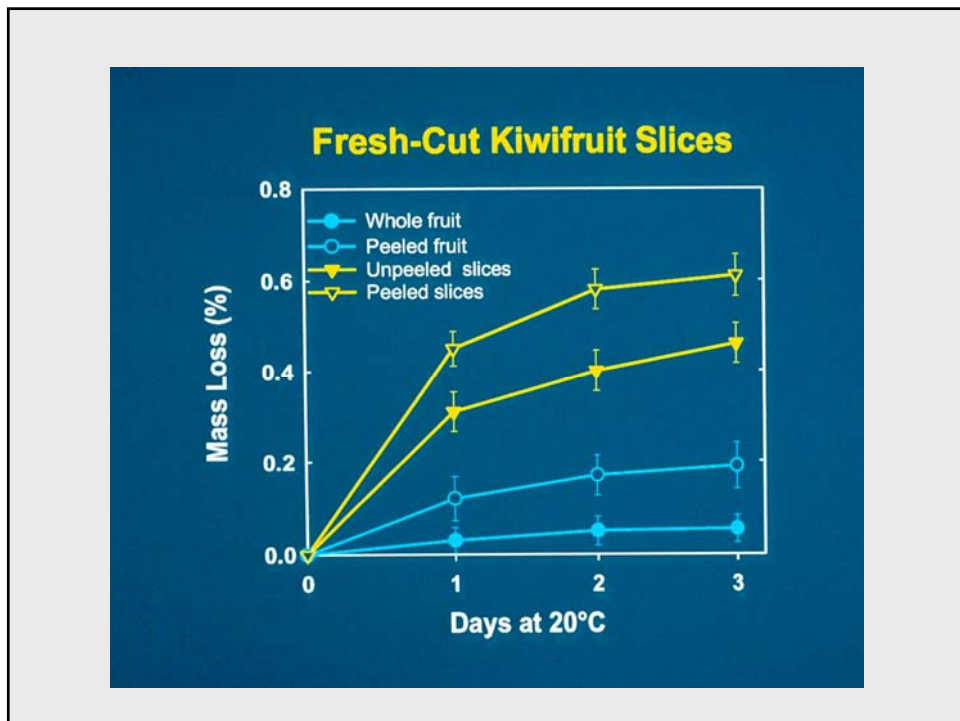
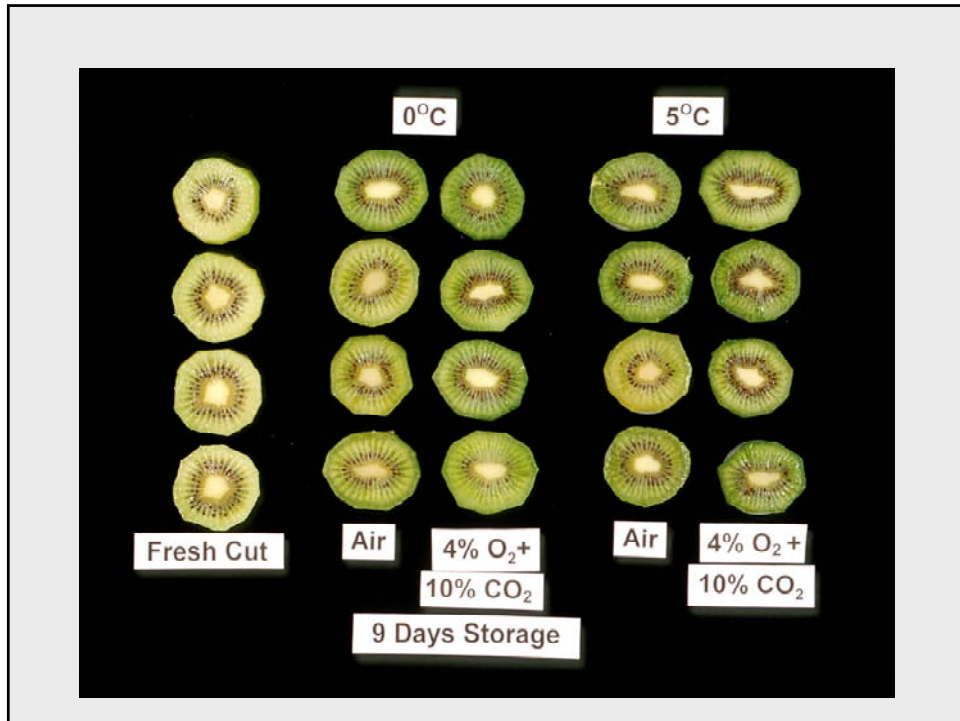


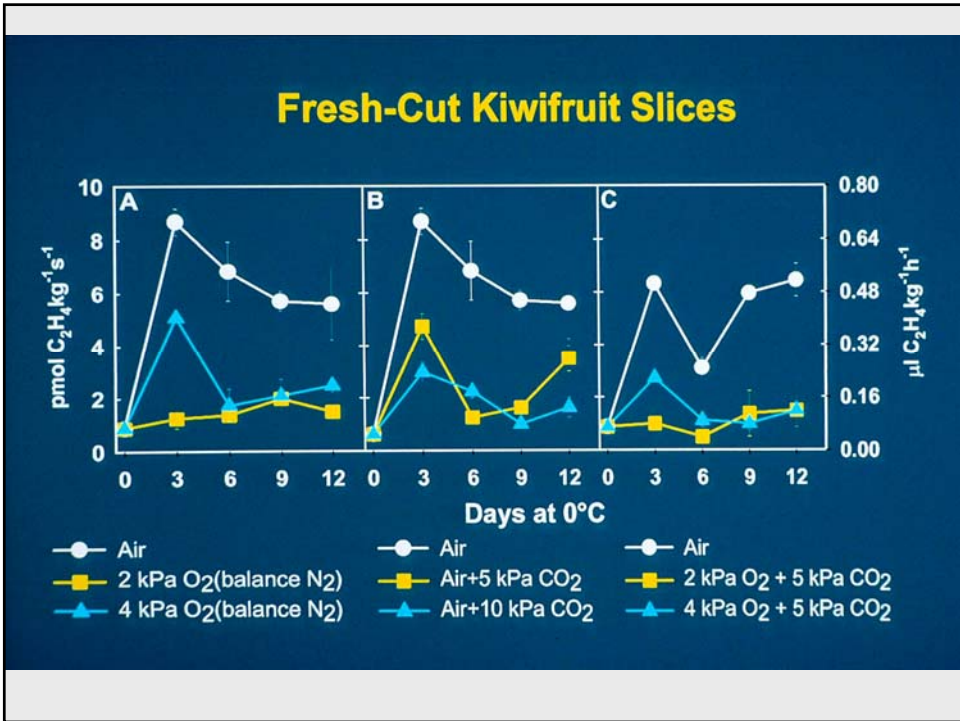
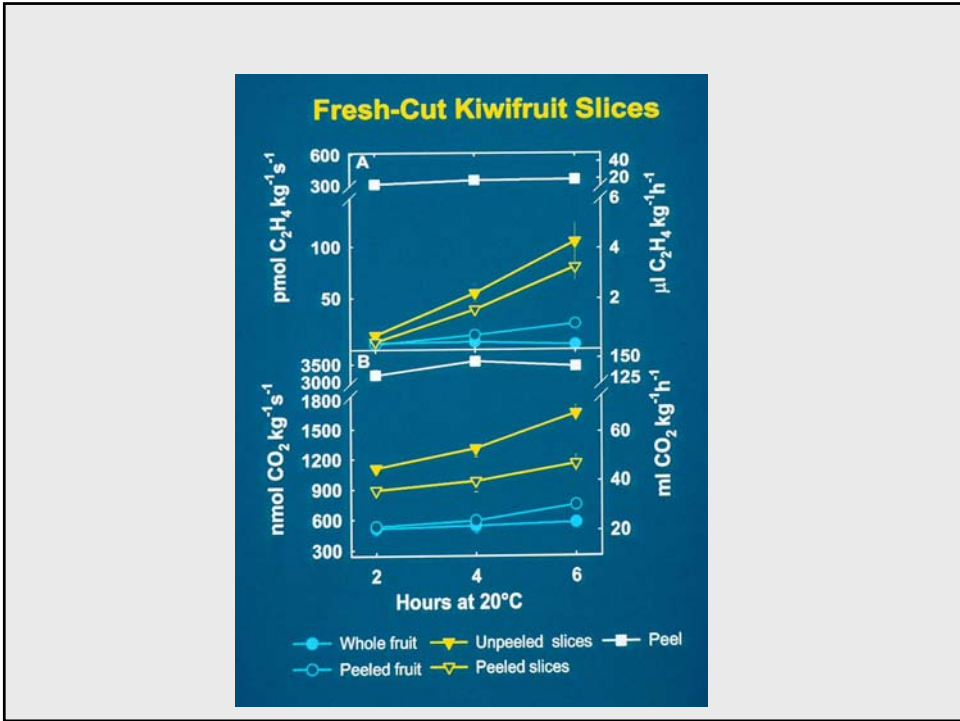


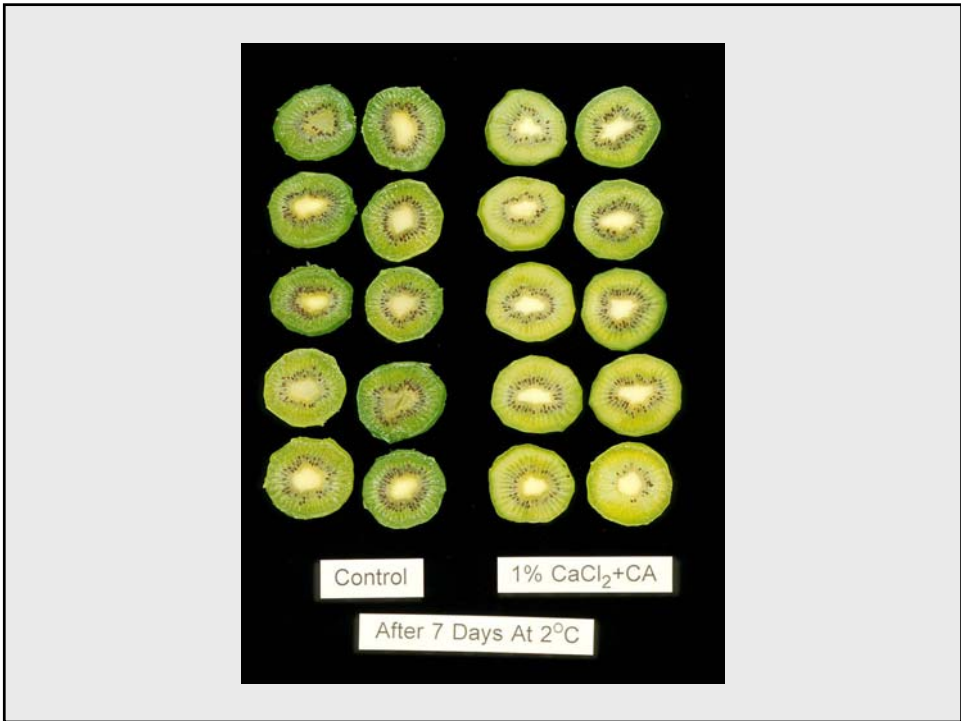
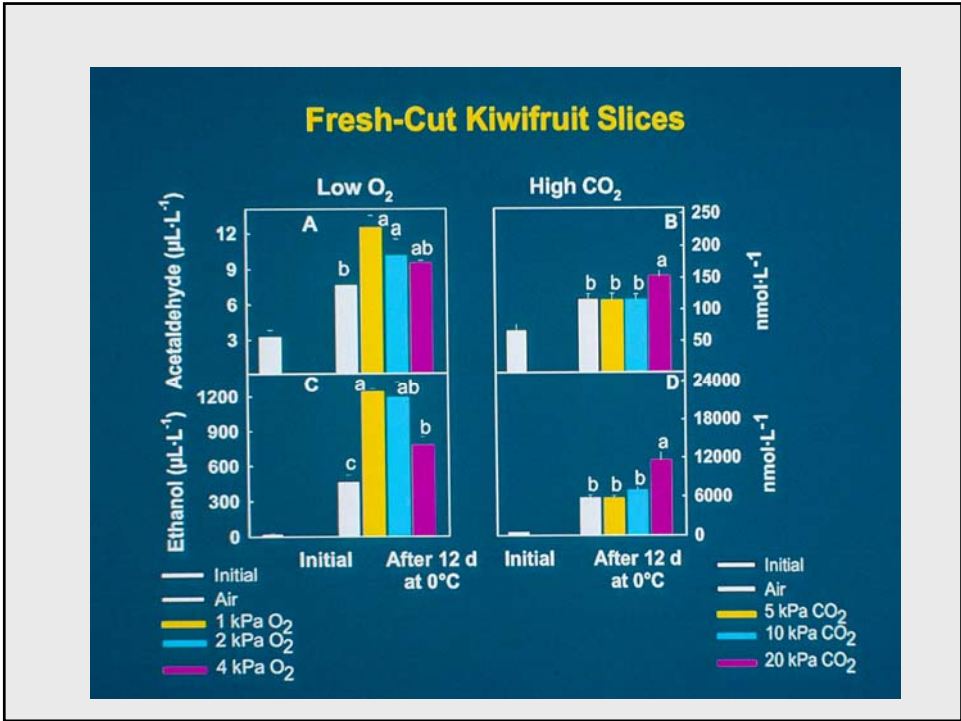












## Conclusions

- *Fresh-cut kiwifruit slices had a shelf-life of 9-12 days if treated with 1% CaCl<sub>2</sub> or 2% Ca lactate, and stored at 0-2°C and >90% relative humidity in an C<sub>2</sub>H<sub>4</sub> – free atmosphere of 2 to 4 kPa O<sub>2</sub> and/or 5 to 10 kPa CO<sub>2</sub>*

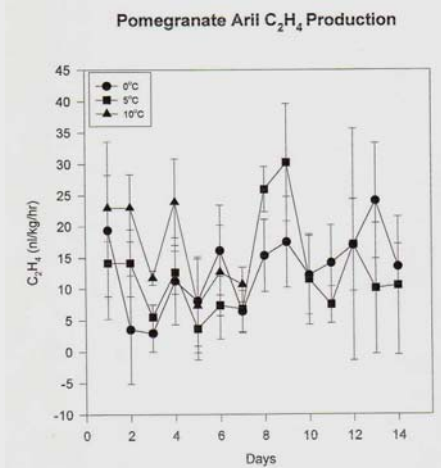
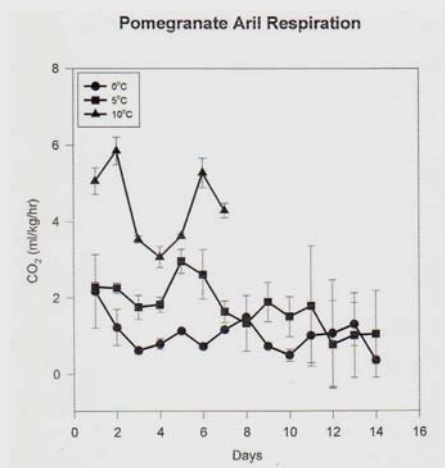
## Pomegranates

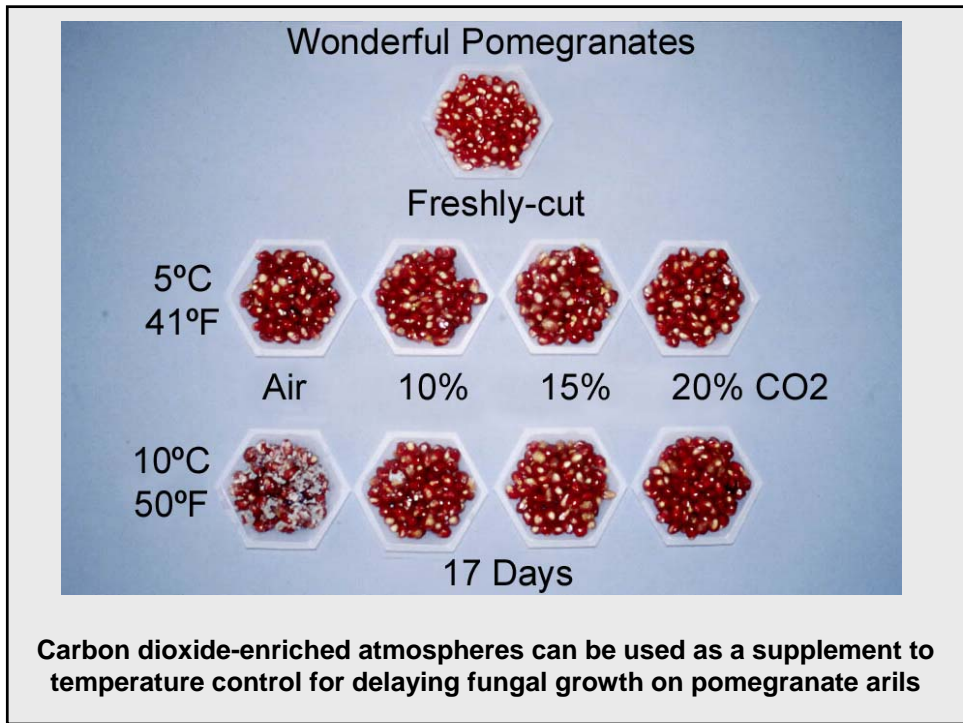
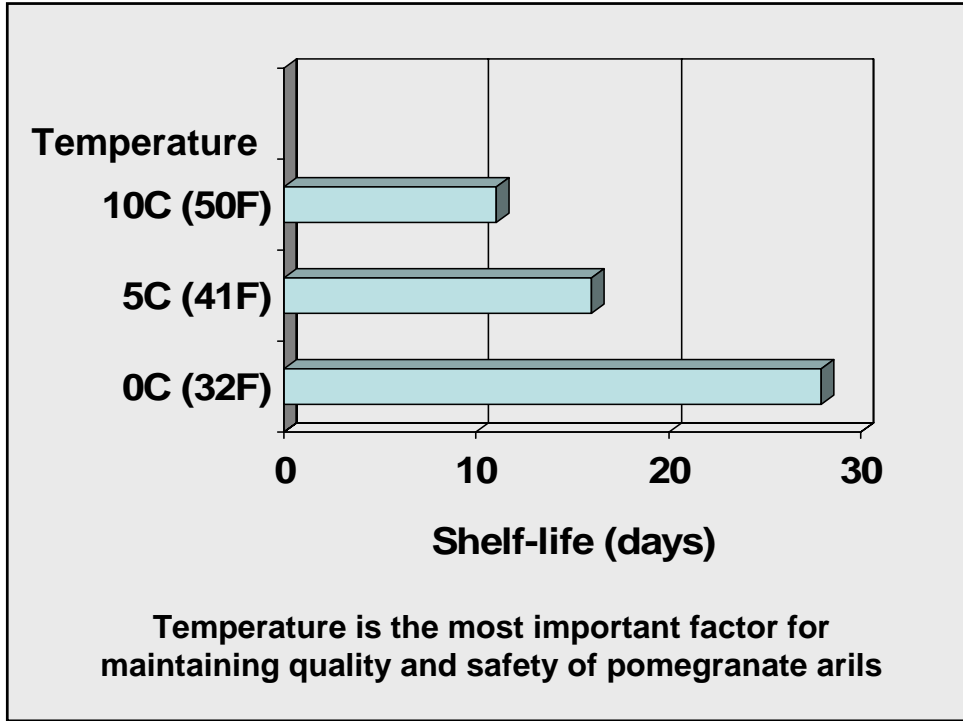




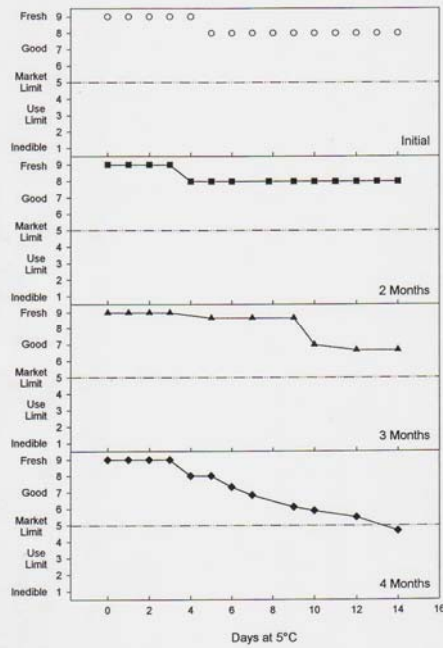
### ***Fresh-Cut Pomegranate***

Respiration and ethylene production rates increase with temperature

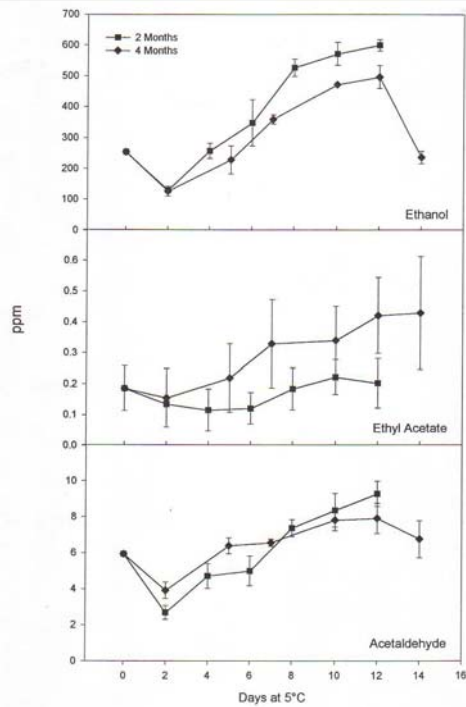


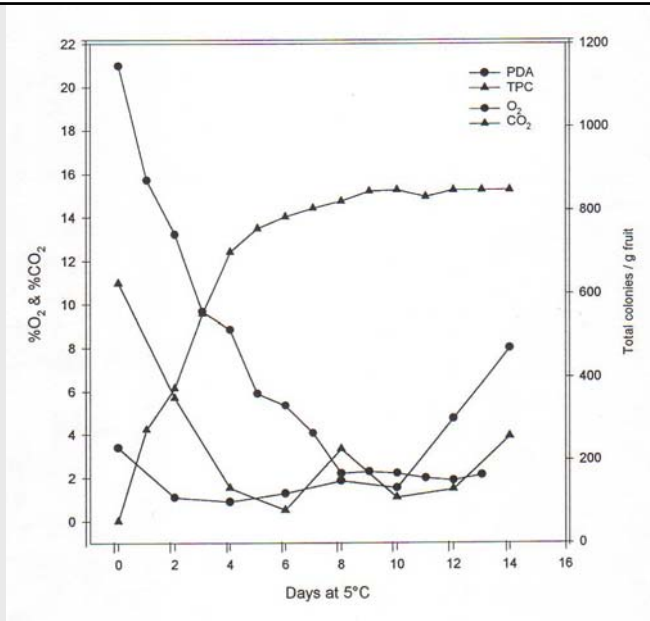


The longer the storage period before aril extraction, the shorter the post-extraction life of the arils



Fermentative metabolites increase during storage of pomegranate arils, but they do not cause off-flavors until they reach higher concentrations than shown above





Elevated carbon dioxide and reduced oxygen levels delay microbial growth on pomegranate arils



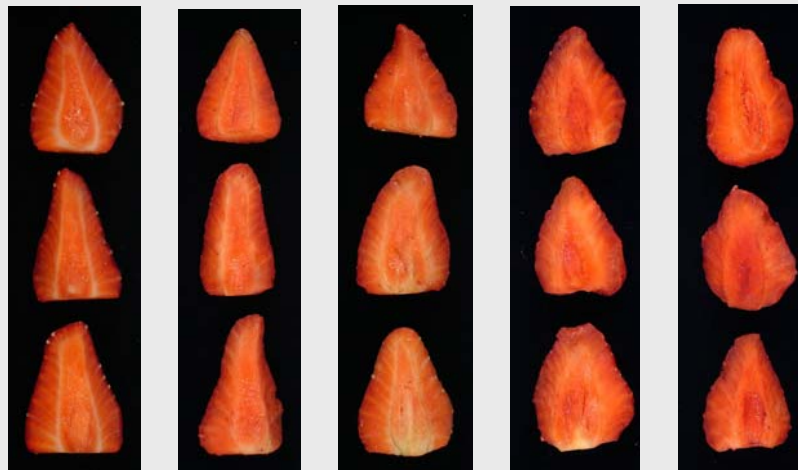
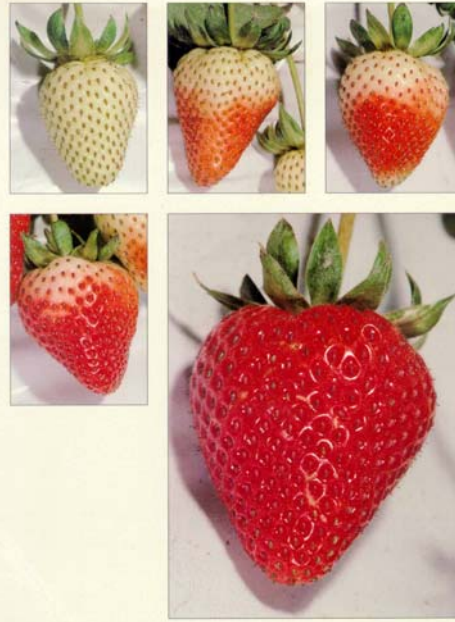


## ***Stages of Strawberry Color Development***

**Minimum color at harvest**

**U.S. -  $\frac{1}{2}$  to  $\frac{3}{4}$  pink**

**Calif. -  $\frac{2}{3}$  pink**



**9            7            5            3            1**  
**Visual Quality Scores for Strawberries**

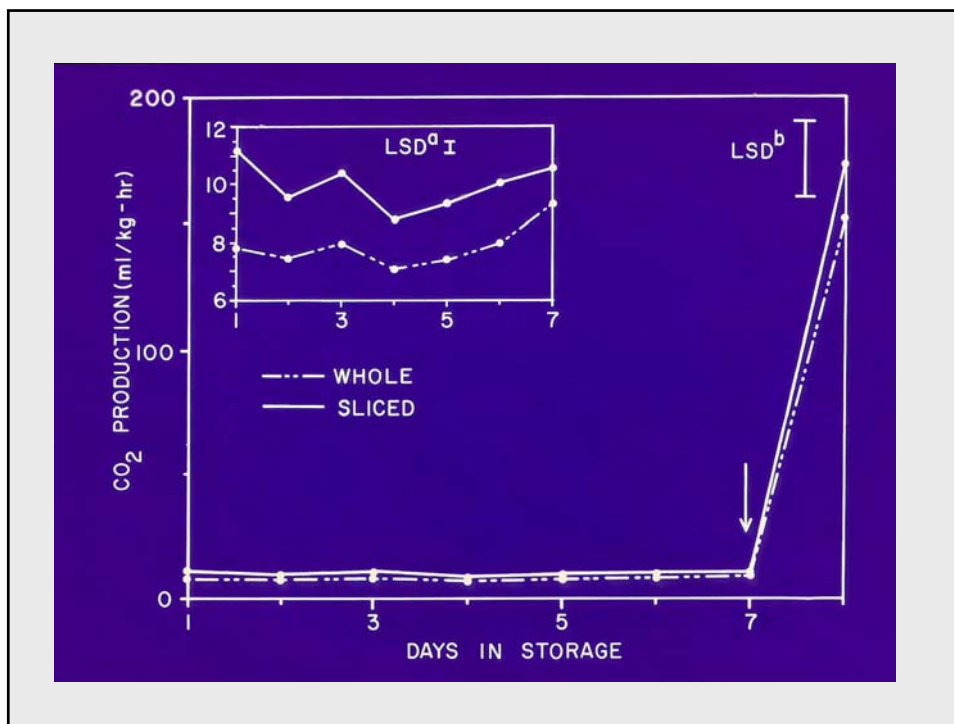
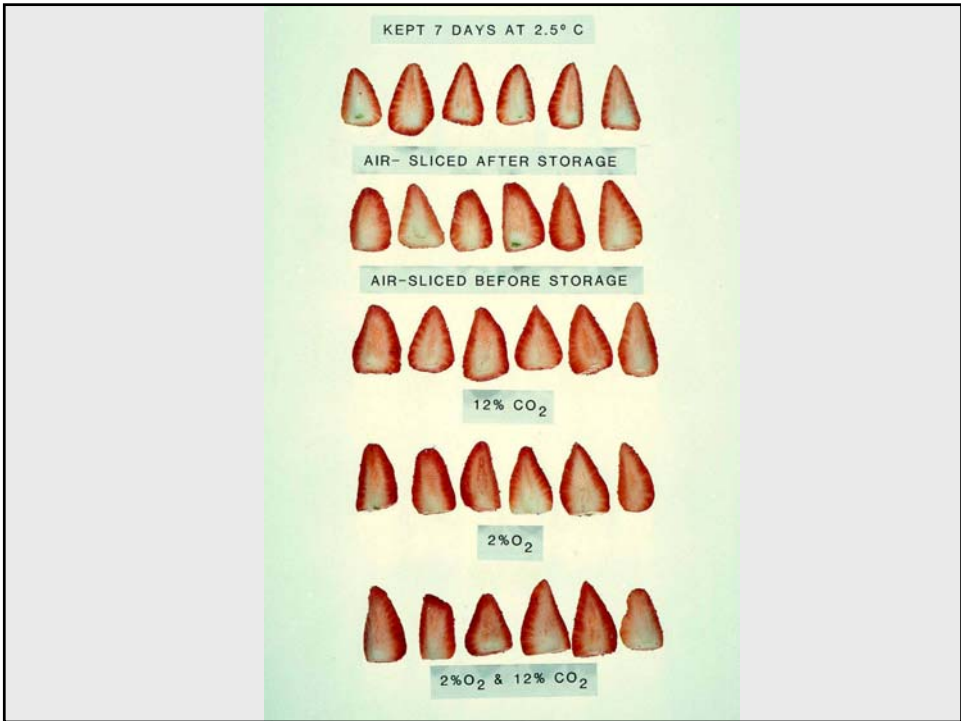
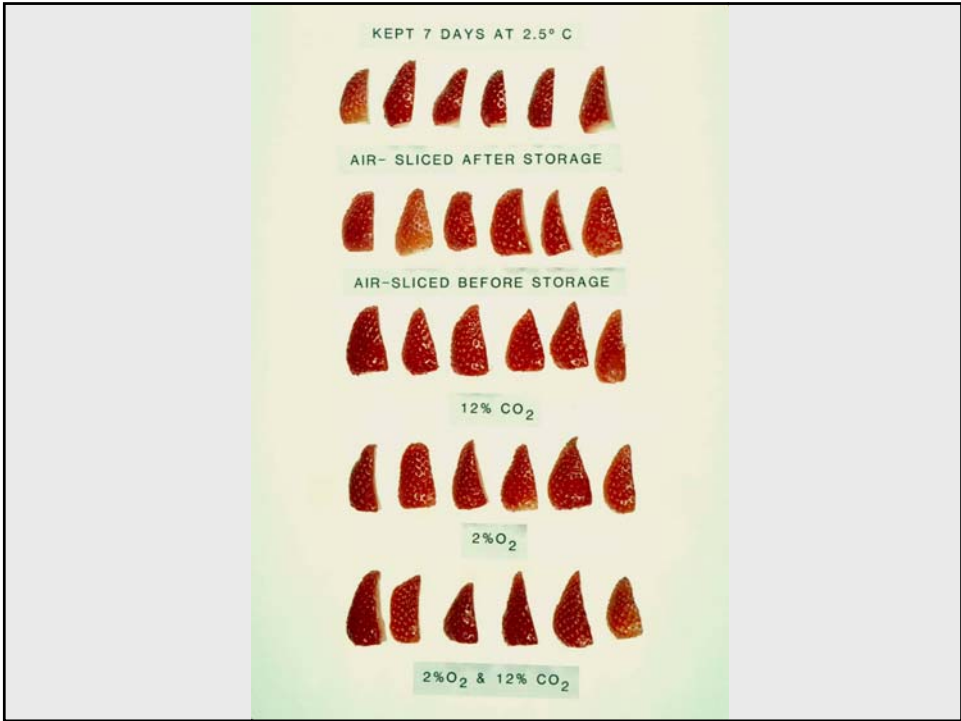


Table 2—Effect of CaCl<sub>2</sub> dips on firmness (relative shear force) of 'G-3' strawberries stored at 2.5°C for 7 days and at 20°C for 1 day

Treatment	Day 0		Day 7		Day 8	
	Firmness (N)	Ca (mg/100g)	Firmness (N)	Ca (mg/100g)	Firmness (N)	Ca (mg/100g)
Water	52.2	10.3 <sup>c</sup>	47.1 <sup>b</sup>	11.4 <sup>c</sup>	47.3 <sup>b</sup>	11.0 <sup>c</sup>
0.5% CaCl <sub>2</sub>	54.3	16.7 <sup>b</sup>	56.3 <sup>a</sup>	16.7 <sup>b</sup>	53.4 <sup>a</sup>	16.8 <sup>b</sup>
1.0% CaCl <sub>2</sub>	53.4	21.4 <sup>a</sup>	57.0 <sup>a</sup>	23.1 <sup>a</sup>	56.7 <sup>a</sup>	22.8 <sup>a</sup>
No dip, freshly sliced	51.4	10.1 <sup>c</sup>	48.9 <sup>b</sup>	10.4 <sup>c</sup>	53.7 <sup>a</sup>	10.7 <sup>c</sup>

<sup>abc</sup> Mean separation in columns for each evaluation time by Duncan's multiple range test, 0.05 level.



Carbon dioxide reduces synthesis of anthocyanins and other phenolic compounds

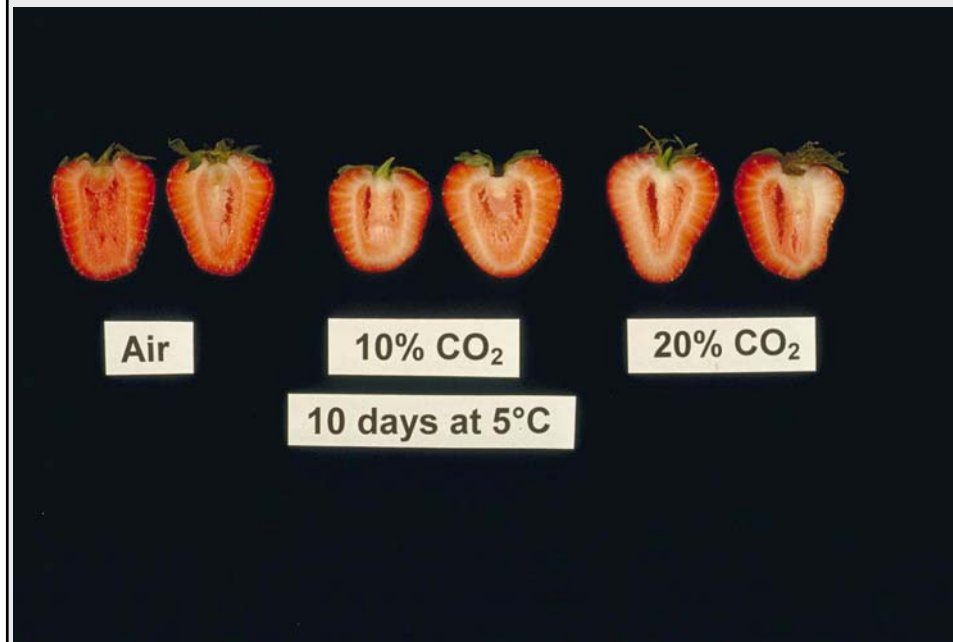
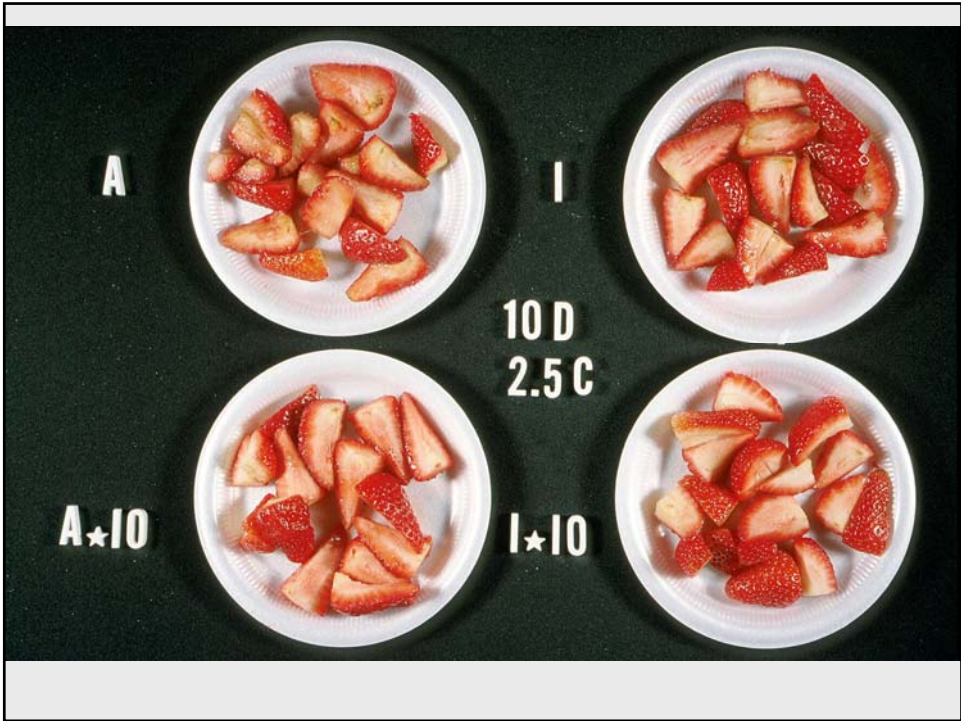


Table 1 – Effect of CA storage on firmness (relative shear force) of 'Pajaro' and 'G-3' strawberries after storage at 2.5°C for 7 days and after transfer to 20°C and air for 1 day

Treatment	Firmness			
	'Pajaro'		'G-3'	
	Day 7	Day 8	Day 7	Day 8
Air - sliced	69.6	58.6 <sup>b</sup>	44.9 <sup>b</sup>	44.5 <sup>b</sup>
12% CO <sub>2</sub>	63.6 <sup>ab</sup>	70.0 <sup>a</sup>	49.5 <sup>a</sup>	49.8 <sup>a</sup>
2% O <sub>2</sub>	56.8 <sup>b</sup>	60.3 <sup>b</sup>	45.0 <sup>b</sup>	38.8 <sup>c</sup>
2% O <sub>2</sub> + 12% CO <sub>2</sub>	66.9 <sup>a</sup>	60.8 <sup>b</sup>	48.3 <sup>a</sup>	47.3 <sup>ab</sup>
Air - whole, freshly sliced	68.1 <sup>a</sup>	54.6 <sup>b</sup>	49.2 <sup>a</sup>	45.1 <sup>b</sup>

<sup>abc</sup> Mean separation in columns for each evaluation time by Duncan's multiple range test, 0.05 level.



## *Respiration Rates and Ethylene Production*



<b>Fruit</b>	<b>Respiration @ 0°C</b>	<b>Respiration @ 20°C</b>	<b>Ethylene @ 5°C</b>
<b>Blackberry</b>	22	155	<0.1
<b>Blueberry</b>	6	68	0.1 to 1.0
<b>Cranberry</b>	3	18	
<b>Raspberry</b>	24	200	
<b>Strawberry</b>	15	127	<0.1
<b>Currant</b>	16	130	
<b>Gooseberry</b>	10	58	

### *Classification of fresh-cut fruit products according to their potential post-cutting-life at optimum handling conditions (0-5°C and 90-95% relative humidity)*

<i>Potential storage-life</i>	<i>Fresh-cut fruit products</i>
<i>10-14 days</i>	<i>Apple wedges, kiwifruit slices, mango cubes, pineapple slices and wedges, pomegranate arils</i>
<i>2-9 days</i>	<i>Banana slices, citrus segments, grape berries, melon cubes, nectarine and peach wedges, papaya cubes, pear wedges, persimmon slices, strawberry slices</i>