



Effects of Fresh-Cut Processing and Storage on Antioxidant Levels in Vegetables

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Outline

- **What fresh-cut processing involves**
- **Effects of fresh-cut processing and storage on antioxidants**
- **Conclusions and future work**



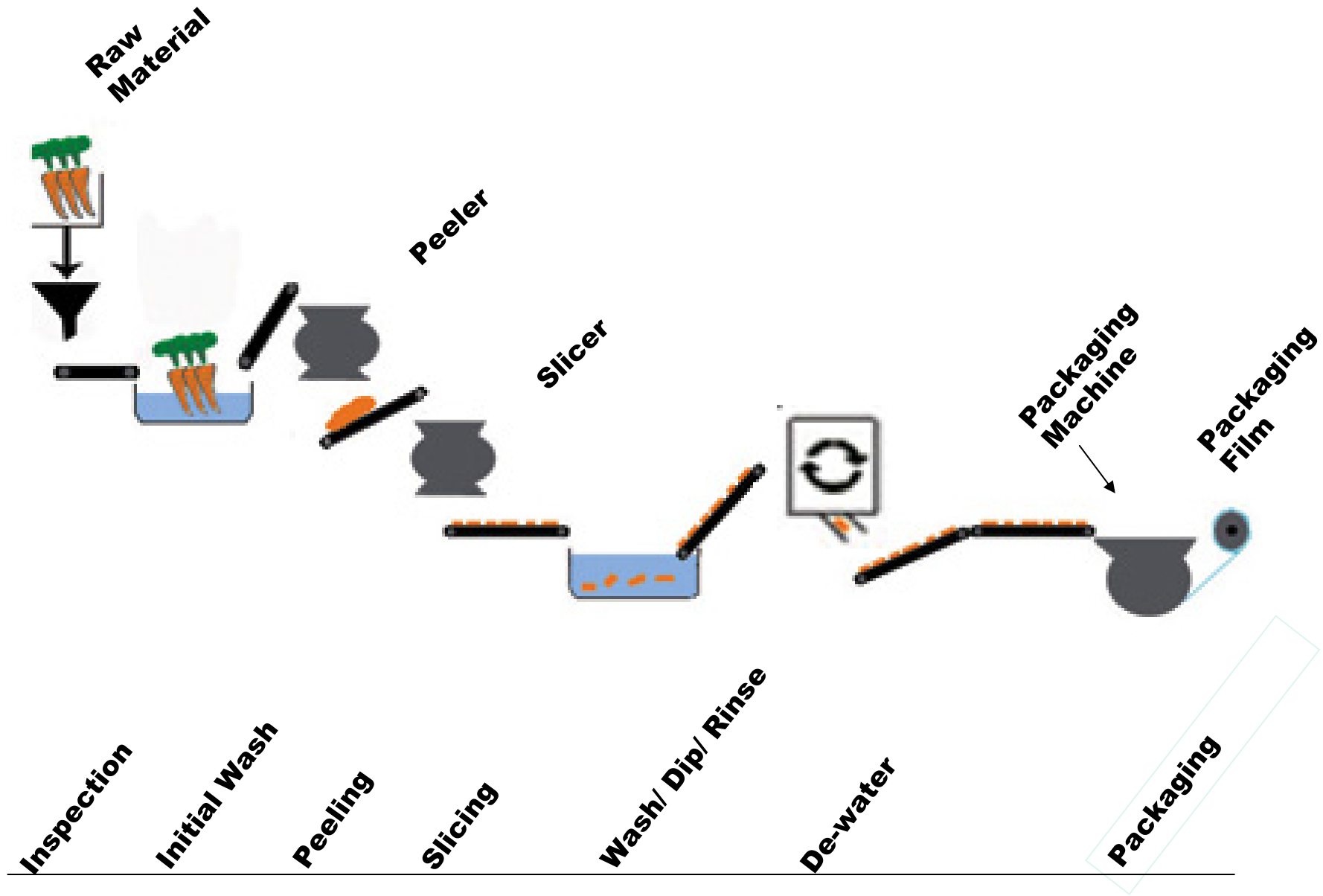
Concerns re Fresh-Cut Produce

- Possible losses of antioxidants in fresh-cut produce as a result of processing and storage.



Antioxidants Measured

- Ascorbic acid, dehydroascorbic acid
- Total and individual carotenoids
- Total and individual phenolic compounds
- Total antioxidant activity



Fresh-Cut Carrot and Lettuce

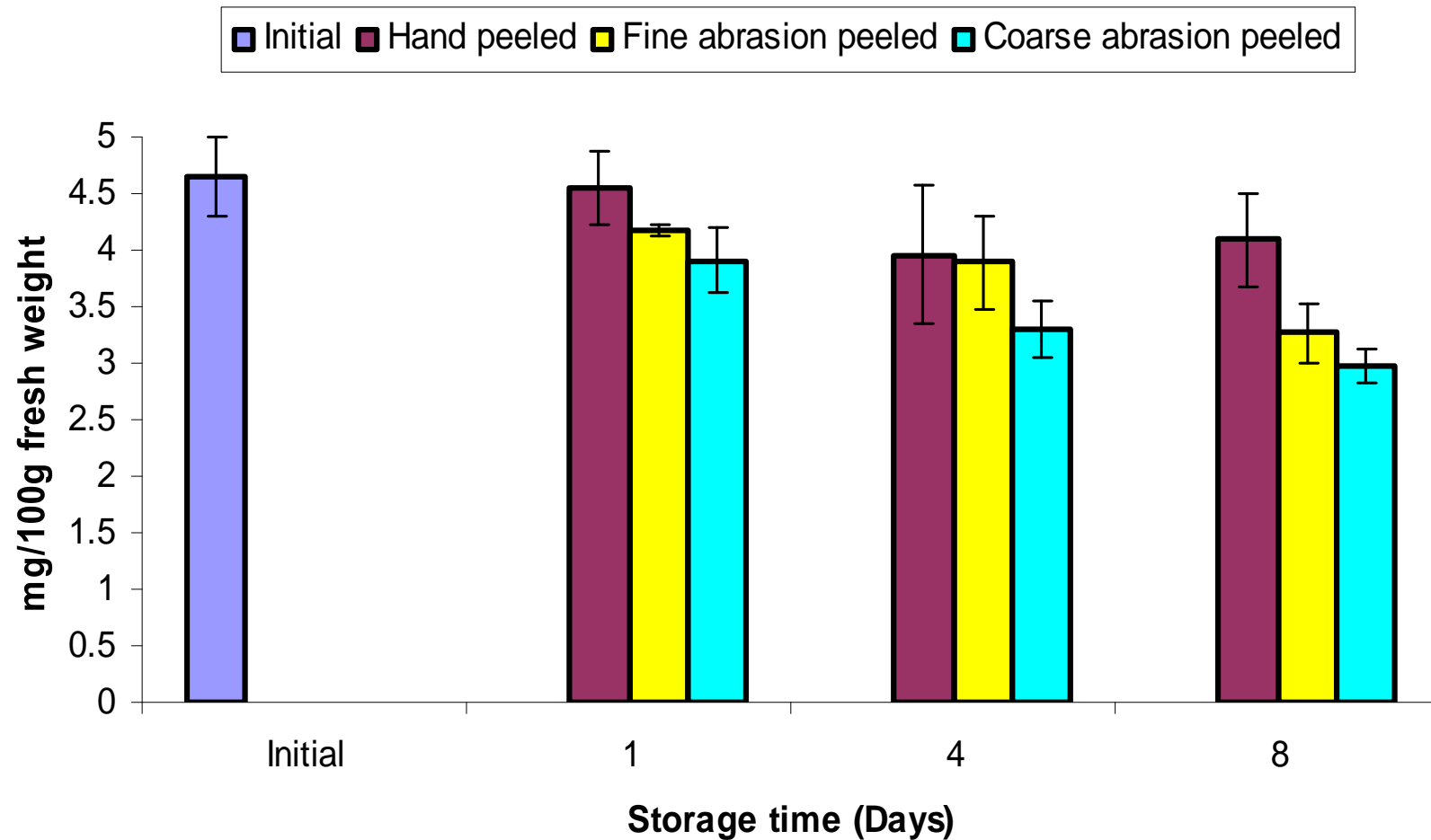
- **Severity of processing**
- **Washing/Anti-Microbial Dipping**
- **Storage time**

- **Ascorbic Acid - very labile antioxidant**
- **Fate of other antioxidants more complex**

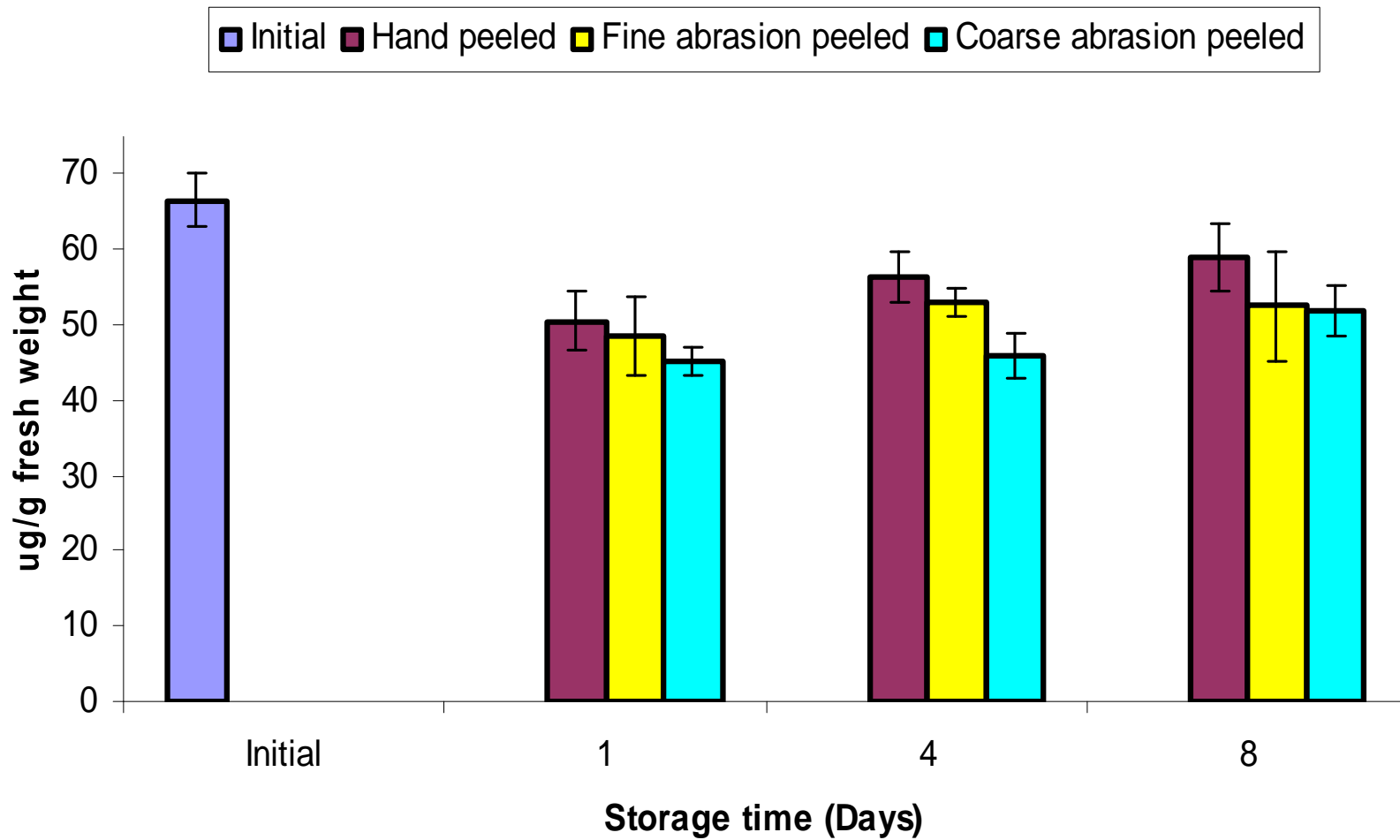
Severity of Peeling in Carrots

- Hand peeling
- Fine Abrasion peeling
- Coarse abrasion peeling
- Cut to discs, packaged in micro-perforated oriented polypropylene, stored 4°C

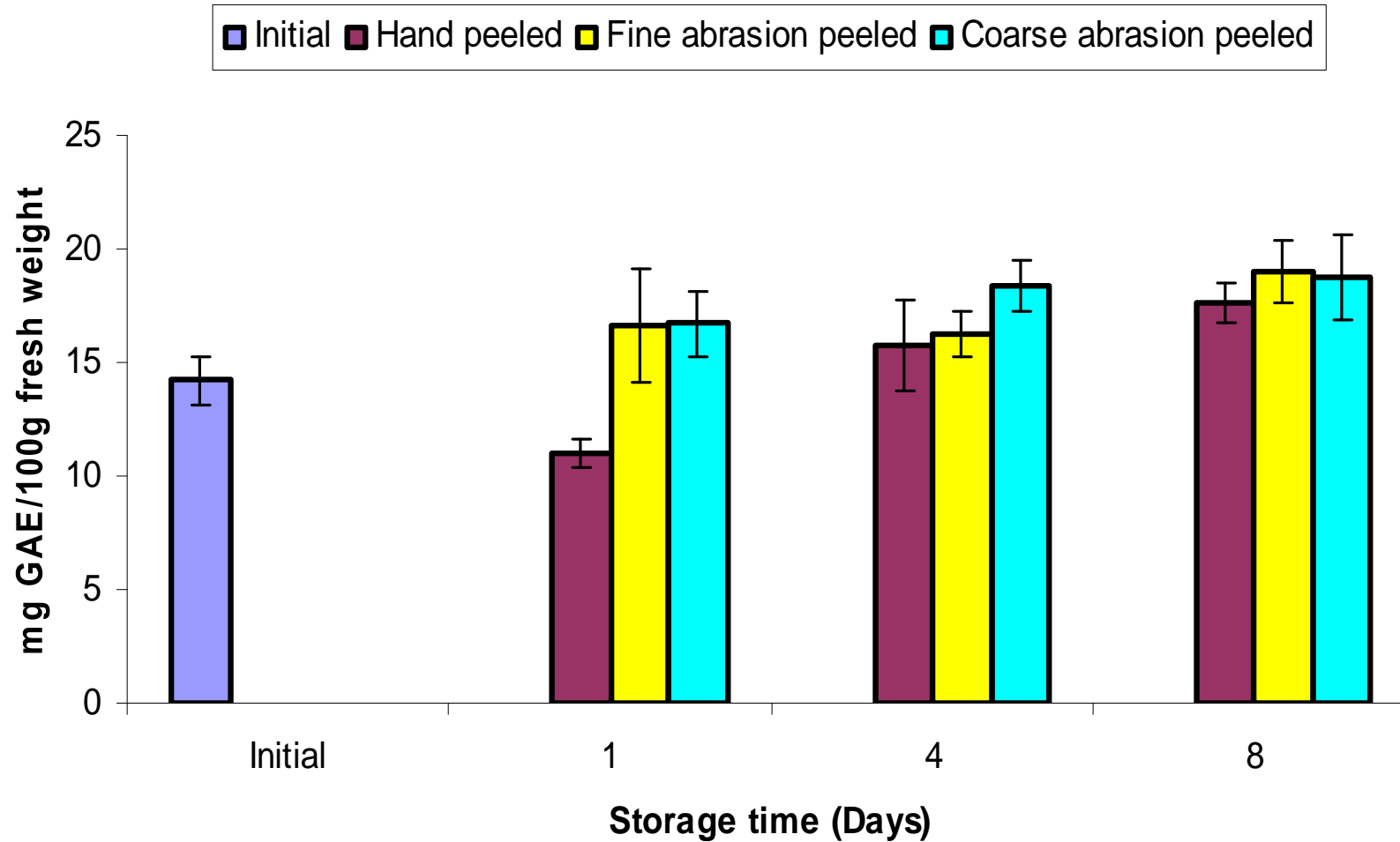
Ascorbic Acid in Fresh-Cut Carrots: Effects of Severity of Peeling



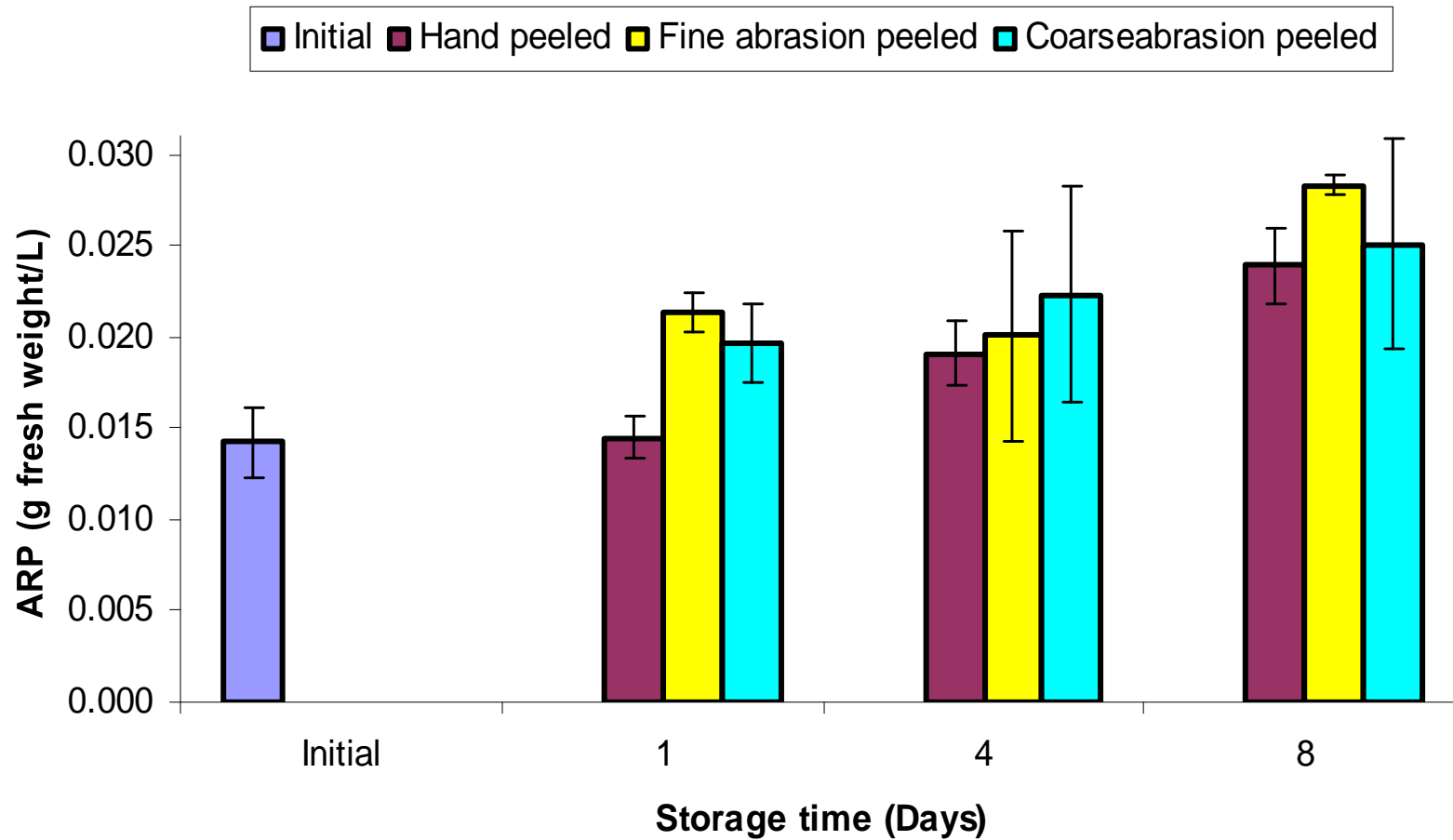
Total Carotenoids in Fresh-Cut Carrots: Effects of Severity of Peeling



Total Phenols in Fresh-Cut Carrots: Effects of Severity of Peeling



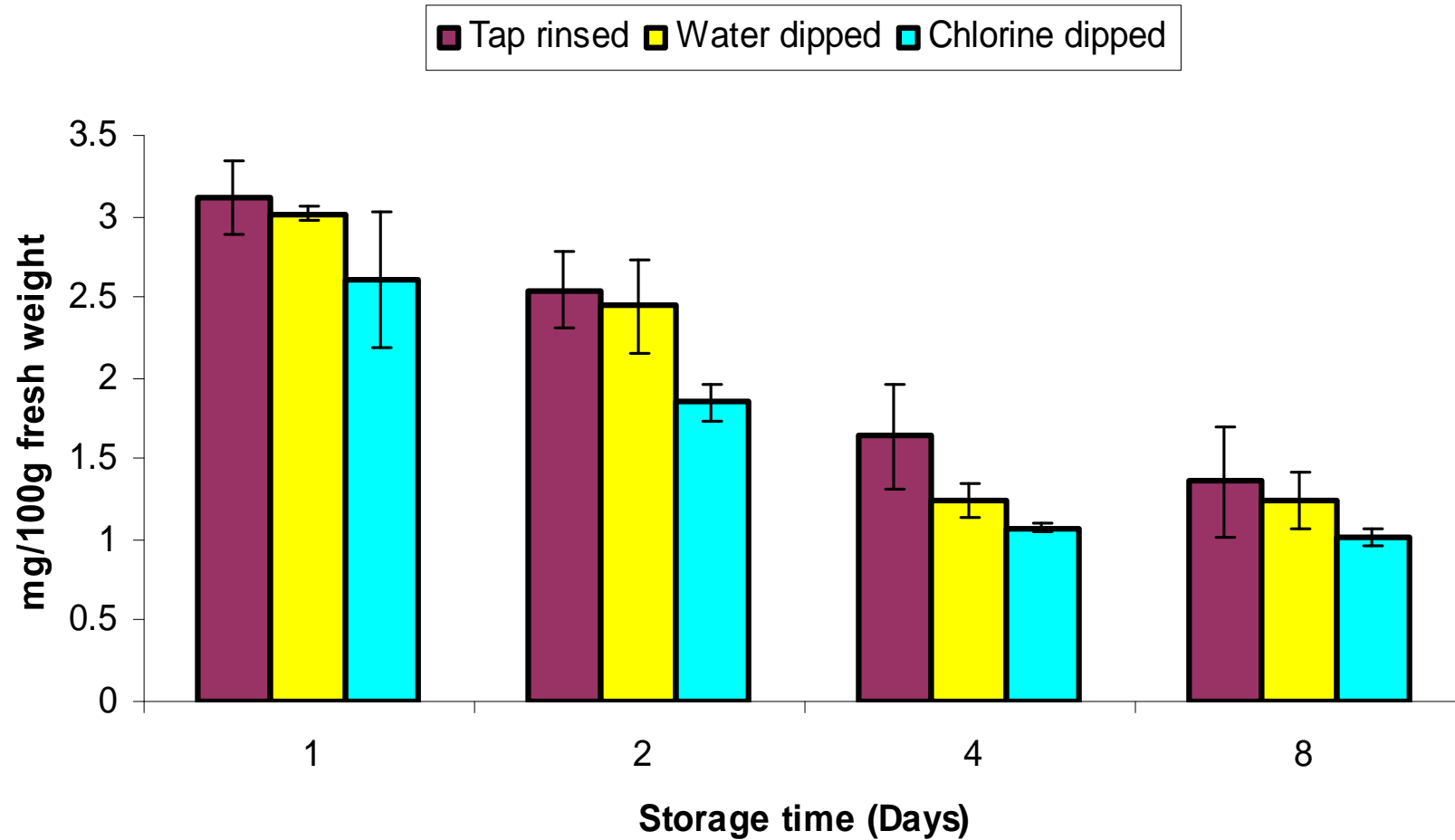
Total Antioxidant Activity in Fresh-Cut Carrots: Effects of Severity of Peeling



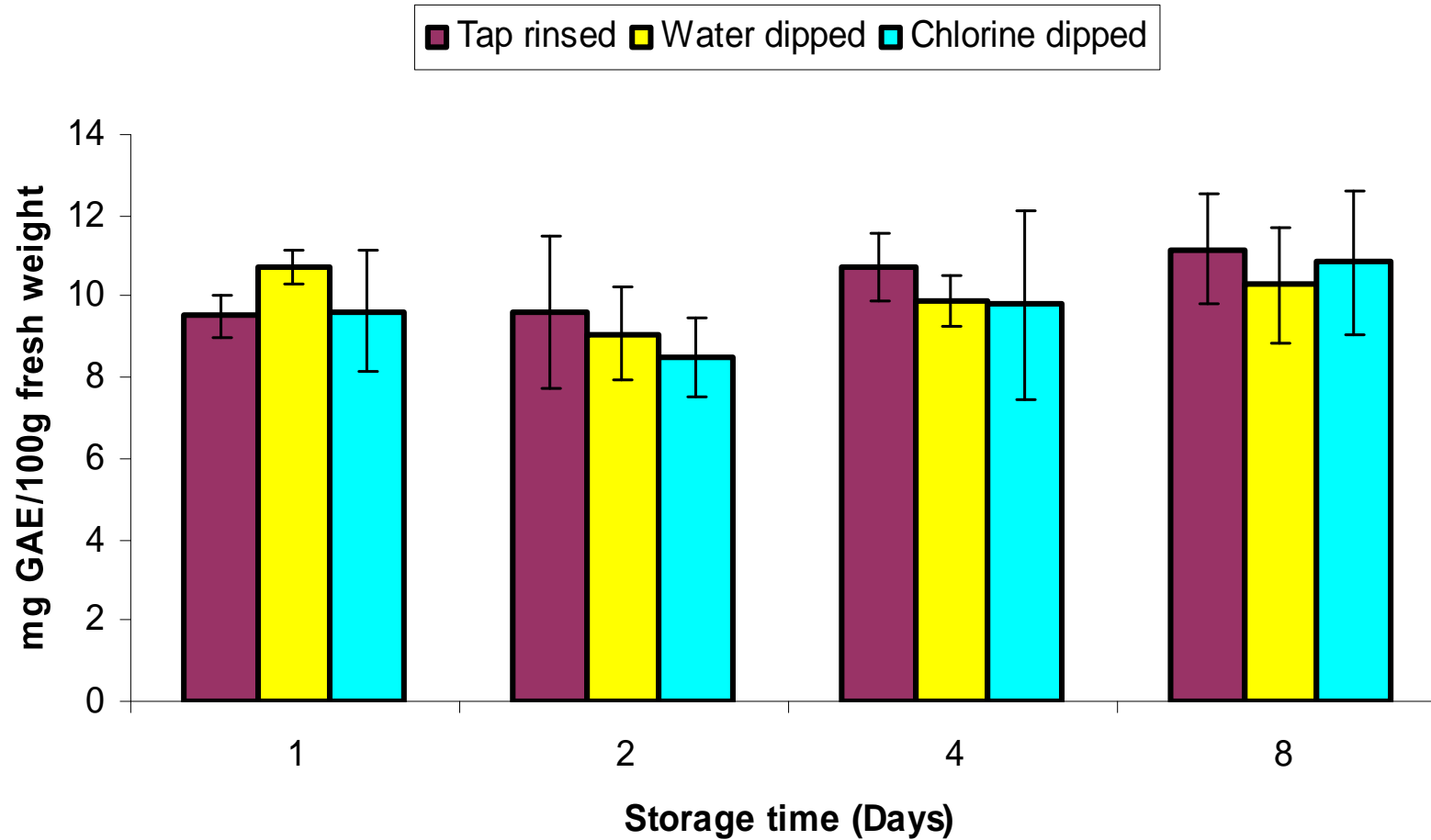
Effects of Washing/ Anti-Microbial Dipping

- **Rinsing in flowing tap water**
- **Immersion in distilled water**
- **Immersion in chlorinated water + rinsing**

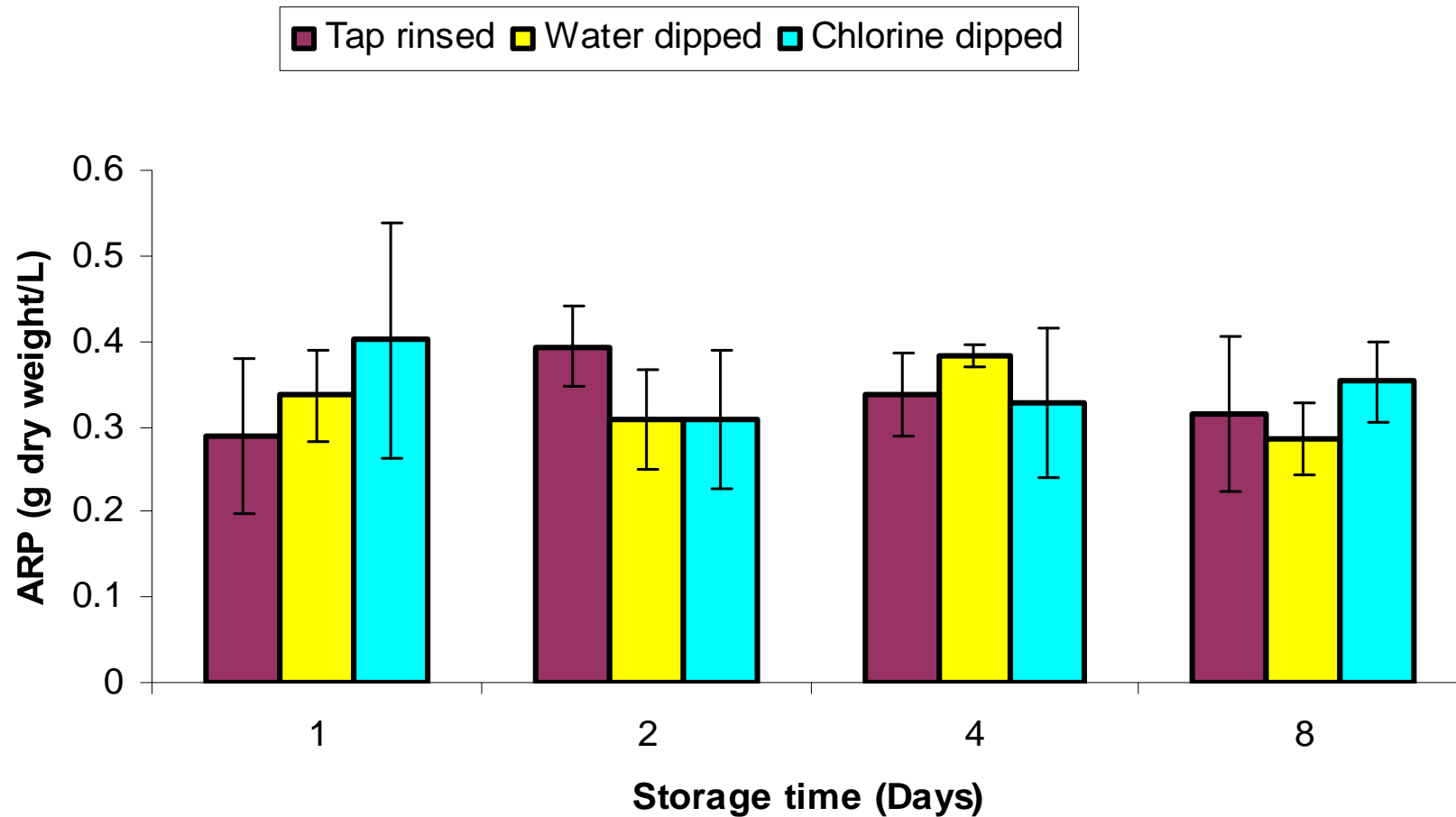
Ascorbic Acid in Fresh-Cut Iceberg Lettuce: Effects of Washing Treatment



Total Phenols in Fresh-Cut Iceberg Lettuce: Effects of Washing Treatment



Total Anti-Radical Power in Fresh-Cut Iceberg Lettuce: Effects of Washing Treatment



Fresh-Cut Effects

- Ascorbic acid lost
- Carotenoids variable
- Phenolics retained or increased
- Total antioxidants retained or increased

Conclusions

- Levels of ascorbic acid reduced by processing and storage.
- Processing steps and storage conditions have smaller effects on other anti-oxidants.
- Total antioxidant levels retained or increased.

Future Work / Research Issues

- Detailed changes in phenolics and carotenoids during storage
- Verification of human significance of increased antioxidant levels using animal and human studies.
- Sensory aspects of increased phenolics

Acknowledgements

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