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IMPACT OF QUALITY DETERIORATION ON THE PRICE OF VEGETABLES THROUGH THE POST HARVEST PROCESS

by

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Fresh fruits and vegetables are enjoying an amazing resurgence in popularity. Unfortunately fresh is not always synonymous with top quality or sound nutrition. From the moment it is picked to the time it reaches the table, a vegetable is undergoing physiological changes most of which are detrimental to flavor, color, textural and nutritive properties. The trip from field to table is a complex one involving numerous steps each one resulting in waste (estimated at \$31 billion annually in the U.S. for all agricultural commodities) and adding to the final cost of the product. Agricultural research has been remarkably successful in learning how to cultivate and grow crops of top quality with high yields. A concerted research effort is needed to better understand and improve the efficiency of postharvest handling by examining the entire agribusiness system.

Innovative avenues of investigation are needed to study the problems associated with postharvest handling. Conventional approaches are too confined to narrow objectives and tend to create more problems than they solve. We propose an interdisciplinary systems approach which seeks to understand the postharvest system as a whole and to solve problems within the context of

each participant in the commodity chain. Analysis of the system will be from the perspective of food scientists who view the fruit or vegetable as a food with quality attributes that must be protected, an agricultural economist who looks at the economic significance of food losses in the marketplace, and an agricultural engineer who wishes to optimize product flow through the system. A key part of the project will be developing the relationship between price and quality.

Using tomatoes as an example, measurements of quality will be taken at various points in the harvesting-distribution system. Examples of quality measures for tomatoes include color, vitamin C, firmness, defects, size, and moisture. Further, cultural conditions such as variety, irrigation, fertilization, maturity at harvest, and pest control, and environmental conditions including temperature, vibration, truck air flow, containers and gases, will be measured prior to harvest through the terminal market and to relate quality, cultural and environment indices to price using a hedonic price function. The purpose of the project will be to relate price to quality and services so as to isolate the stages in the postharvest system that exhibit the greatest loss of value/quality. We will also simulate the handling of

tomatoes beyond the terminal market to determine shelf-life.

Given the price/quality-services relationships established, the benefit of the project will be to modify handling techniques based on value. Of benefit-cost analysis can then be carried out to determine if various handling techniques are economically

feasible, given the impact of the system change on the price of tomatoes.

We envision this project as an important first step in the understanding and improvement of the postharvest handling system through an increase in the efficient distribution of food to better satisfy consumer needs.