

Accepted Manuscript

Quality in competitive fresh produce supply chains with application to farmers' markets

Deniz Besik, Anna Nagurney

PII: S0038-0121(16)30212-9

DOI: [10.1016/j.seps.2017.03.001](https://doi.org/10.1016/j.seps.2017.03.001)

Reference: SEPS 575

To appear in: *Socio-Economic Planning Sciences*

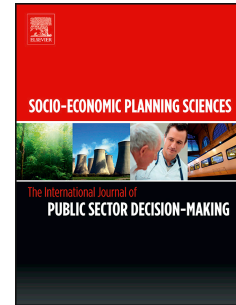
Received Date: 28 September 2016

Revised Date: 4 March 2017

Accepted Date: 4 March 2017

Please cite this article as: Besik D, Nagurney A, Quality in competitive fresh produce supply chains with application to farmers' markets, *Socio-Economic Planning Sciences* (2017), doi: 10.1016/j.seps.2017.03.001.

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**Quality in Competitive Fresh Produce Supply Chains
with
Application to Farmers' Markets**

Deniz Besik and Anna Nagurney
Department of Operations and Information Management
Isenberg School of Management
University of Massachusetts, Amherst, Massachusetts 01003

September 2016; revised December 2016; revised March 2017

To appear in *Socio-Economic Planning Sciences*

Abstract: Fresh produce supply chains have special characteristics, notably, that the quality of the product (fruit or vegetable) deteriorates continuously over time, even under ideal conditions. In this paper, we begin with explicit formulae for fresh produce quality deterioration based on chemistry and temperature and provide a path-based framework. We then focus on farmers' markets, the popularity of which has been growing due to consumers' greater awareness of and interest in product quality and emphasis on health. Farmers' markets, as examples of direct to consumer channels and shorter supply chains, are studied in the framework of game theory in both uncapacitated and capacitated versions. A case study of apples in Massachusetts, under various scenarios, including production disruptions, provides quantitative evidence of the applicability of our supply chain network approach.

Key words: quality, food supply chains, fresh produce, oligopolistic competition, food deterioration, product differentiation

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