



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Recapturing Value from Food Safety Certification:
Incentives and Firm Strategy

Suzanne Thornsby
Mollie Woods
Kellie Raper

American Agricultural Economics Association - 2006
Pre-Conference Workshop: New Food Safety
Incentives and Regulatory, Technological, and
Organizational Innovations
July 22, 2006, Long Beach, CA

Recapturing value from food safety certification: incentives and firm strategy

Suzanne Thornsby

Mollie Woods

Kellie Raper

Department of
Agricultural Economics
MICHIGAN STATE
UNIVERSITY

Overview

- Food safety, certification, and advertising
- Example from fresh produce: fresh strawberries
- Good Agricultural Practices and certification
- Spatial equilibrium model: regional movement within NAFTA incorporating costs, shrinkage and differential supply and demand
- Room for advertising
- Implications

Demand for food safety practices and certification

- Heightened awareness of food safety issues at every link in the supply chain
 - On-farm practices a potential source of contamination and an important first step in managing food safety
- Good Agricultural Practices (GAPs)
 - National GAPs program to develop key practices – but at what cost?
- Third party certification
 - Provides for differentiation, but
 - Often expensive and subjective

NAFTA fresh strawberry market

- Analyze impacts of GAPs adoption and third-party certification on grower costs and regional trade patterns
- Implications for industry structure and regional strategy
- Industry where firms are faced with critical decisions regarding the adoption of food safety technologies
 - High profile outbreaks
 - Fresh product with minimal handling
 - Application to other fresh produce

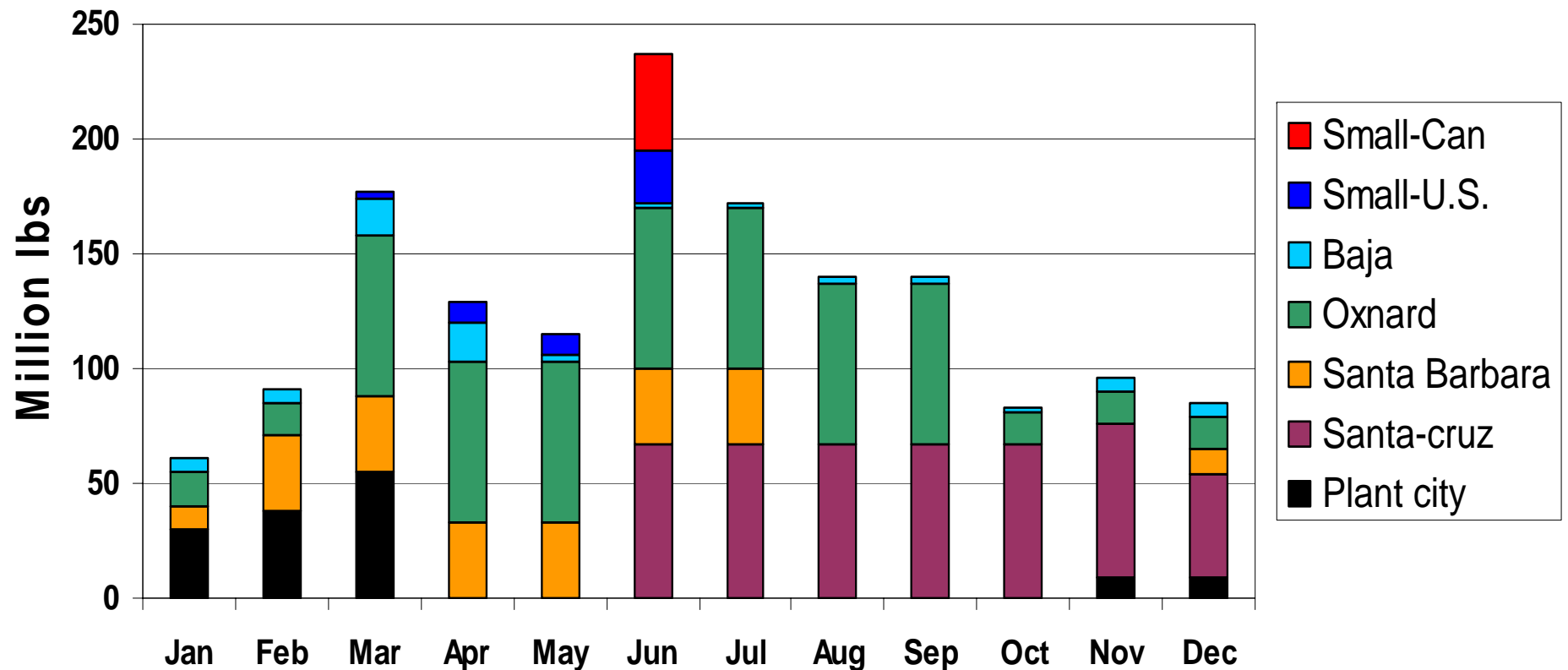
NAFTA fresh strawberry market

- Distinctly bi-modal
 - Structure and production systems
 - More acreage and fewer farms in large volume regions and more farms with less acreage in small volume regions
- Production areas throughout North America
- Essentially a closed system within NAFTA
 - Only a few fresh exports to Japan



Seasonal production patterns

Monthly Fresh Strawberry Production (U.S., Canada, and Baja)



The Model

minimize
$$\sum_i \sum_j (c_{ij} + s_{ij} + p_i) x_{ij}$$

subject to:

$$\sum_j x_{ij} \leq a_i \quad \text{for all } i \text{ (supply limit in region } i \text{)}$$

$$\sum_i x_{ij} \geq b_j \quad \text{for all } j \text{ (satisfy demand in region } j \text{)}$$

- 17 supply regions and 72 demand regions
 - Small and large producers in each region (80/20) with small producers non-certified and large certified
- Incorporates seasonal production patterns
- Shrinkage for on-farm and transportation losses
 - Function of distance between i and j and of that distance value squared

$$s(i,j) = .000001 * d(i,j) + .000000003 * d(i,j)^2$$

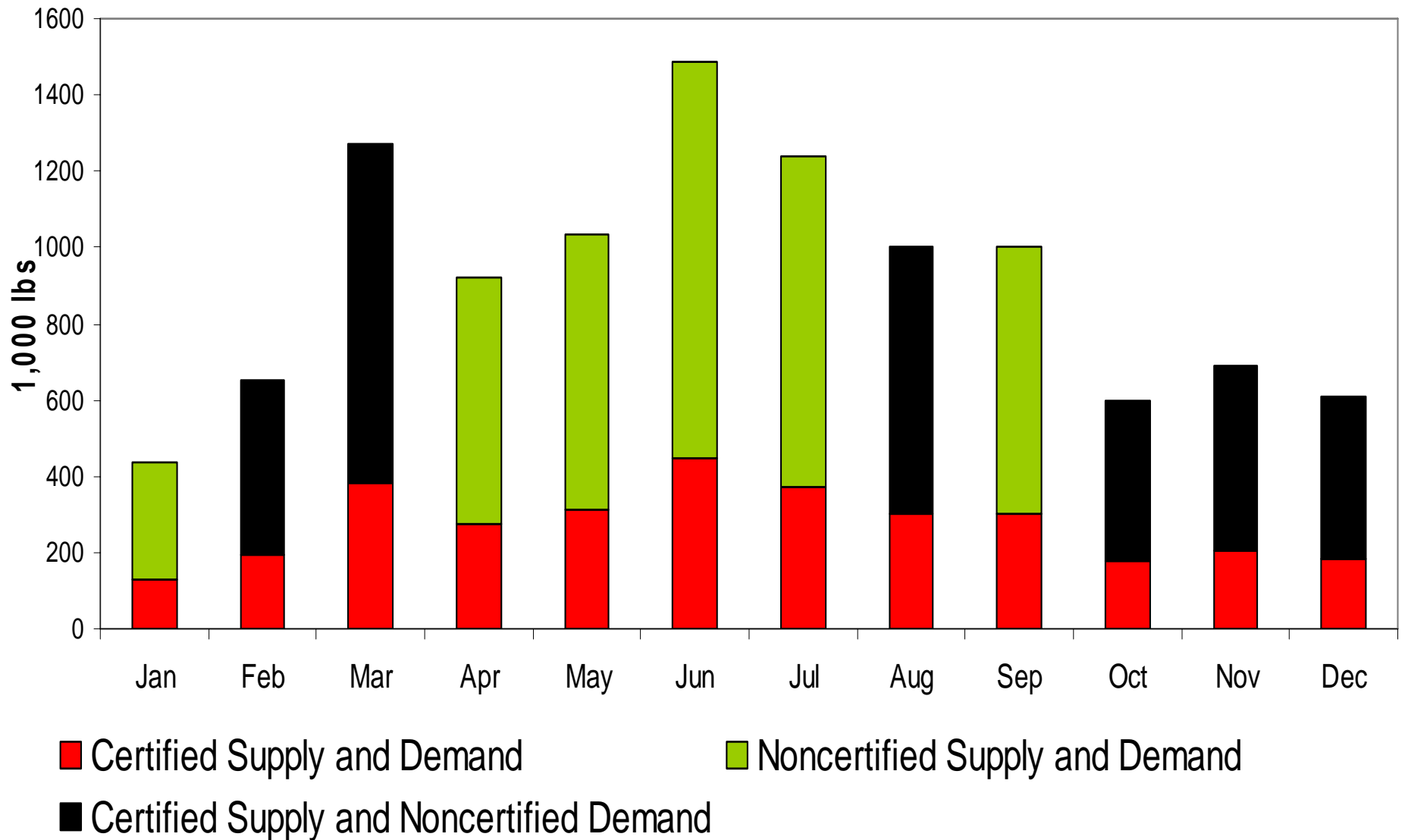
GAPs for fresh strawberries and third-party certification

- Good Agricultural Practices
 - Mix of fixed and variable costs (e.g. toilet and handwashing facilities, crisis management training, disposable picking containers)
 - Cost ranged from \$290 per acre for small producers to \$200 per acre for large producers
- Third-party certification
 - Certification fee in addition to costs of adopting practices (\$8000 in our example)
- All growers adopt GAPs but not all become certified

Incentives to promote adoption of GAPs and certification

- GAPs and Certification
 - Grower incentives include maintaining marketing opportunities and some regulatory incentives (e.g. OSHA standards)
 - Retailer incentives include capturing or retaining market share and decreased liability
- Are there incentives for further promotion of food safety practices?
 - Evidence from GMO and meat industry literature suggests small, but positive impact of information on WTP for food safety (see for example, Tegene et al, 2003 or Kinnucan and Zheng, 2004)

Regional shipments- Montpelier, VT



Marginal values for selected production regions

Supply Region and type of berry produced		March	June	September	December
Akron, OH	non-cert	-0.352	-0.829	-0.293	-0.136
	certified	-0.411	-0.906	-0.352	-0.195
Baja, MX	non-cert	-0.880	-1.381	-0.605	-0.601
	certified	-0.902	-1.403	-0.627	-0.623
Oxnard, CA	non-cert	-0.404	-0.898	-0.122	-0.128
	certified	-0.410	-0.904	-0.128	-0.134
Plant City, FL	non-cert	-0.255	-0.849	-0.177	-0.006
	certified	-0.269	-0.863	-0.163	-0.020
Toronto, CN	non-cert	-0.678	-1.130	-0.625	-0.468
	certified	-0.741	-1.215	-0.688	-0.531

Bold text indicates that fresh strawberries are available

Implications for promotion

- Some room for advertising certified berries within a single region
 - Akron, OH – 8 cents/lb
 - Baja -2 cents/lb
 - Larger difference in cost savings between certified and non-certified berries among producers in small regions when they are in the market
 - At most three months of the year
- But, in NAFTA region an additional unit from Baja results in greater cost savings than same unit from Akron
 - If production was available from Baja, they could spend up to 50 cents/lb on advertising before losing share to Akron
- Implies some regions better off targeting promotions to specific seasons



THANK YOU!

Suzanne Thornsby is an assistant professor of Agricultural Economics at Michigan State University. Her areas of interest include global produce markets, international trade, food policy, and market competitiveness. thornsby@anr.msu.edu

Mollie Woods is a research specialist in the Department of Agricultural Economics at Michigan State University and is interested in the economics of food safety, production and trade of horticultural products and food policy.

willi751@anr.msu.edu

“New Food Safety Incentives & Regulatory, Technological & Organizational Innovations” - 7/22/2006, Long Beach, CA

AAEA section cosponsors: FSN, AEM, FAMPS, INT

Industry perspectives on incentives for food safety innovation

Continuous food safety innovation as a management strategy

Dave Theno, Jack in the Box, US

Economic incentives for food safety in their supply chain

Susan Ajeska, Fresh Express, US

Innovative food safety training systems

Gary Fread, Guelph Food Technology Centre, Canada

Organizational and technological food safety innovations

Is co-regulation more efficient and effective in supplying safer food?

Marian Garcia, Dept. of Agricultural Sciences, Imperial College London

Andrew Fearne, Centre for Supply Chain Research, University of Kent, UK

Chain level dairy innovation and changes in expected recall costs

Annet Velthuis, Cyriel van Erve, Miranda Meuwissen, & Ruud Huirne

Business Economics & Institute for Risk Management in Agriculture,
Wageningen University, the Netherlands

“New Food Safety Incentives & Regulatory, Technological & Organizational Innovations” - 7/22/2006, Long Beach, CA (con’t)

Regulatory food safety innovations

Prioritization of foodborne pathogens

Marie-Josée Mangen, J. Kemmeren, Y. van Duynhoven, A.H. and Havelaar, National Institute for Public Health & Environment (RIVM), the Netherlands

Risk-based inspection: US Hazard Coefficients for meat and poultry

Don Anderson, Food Safety and Inspection Service, USDA

UK HAS scores and impact on economic incentives

Wenjing Shang and Neal H. Hooker, Department of Agricultural, Environmental & Development Economics, Ohio State University

Private market mechanisms and food safety insurance

Sweden’s decade of success with private insurance for *Salmonella* in broilers

Tanya Roberts, ERS, USDA and Hans Andersson, SLU, Sweden

Are product recalls insurable in the Netherlands dairy supply chain?

Miranda Meuwissen, Natasha Valeeva, Annet Velthuis & Ruud Huirne, Institute for Risk Management in Agriculture; Business Economics & Animal Sciences Group, Wageningen University, the Netherlands

Recapturing value from food safety certification: incentives and firm strategy

Suzanne Thornsby, Mollie Woods and Kellie Raper

Department of Agricultural Economics, Michigan State University

“New Food Safety Incentives & Regulatory, Technological & Organizational Innovations” - 7/22/2006, Long Beach, CA (con’t)

Applications evaluating innovation and incentives for food safety

Impact of new US food safety standards on produce exporters in northern Mexico

Belem Avendaño, Department of Economics, Universidad Autónoma de Baja California, Mexico and Linda Calvin, ERS, USDA

EU food safety standards and impact on Kenyan exports of green beans and fish

Julius Okello, University of Nairobi, Kenya

Danish *Salmonella* control: benefits, costs, and distributional impacts

Lill Andersen, Food and Resource Economics Institute, and Tove Christensen, Royal Danish Veterinary and Agricultural University, Denmark

Wrap up panel discussion of conference

FSN section rep. – Tanya Roberts, ERS, USDA

AEM section rep. – Randy Westgren, University of Illinois

INT section rep. – Julie Caswell, University of Massachusetts

FAMPS section rep. – Jean Kinsey, University of Minnesota

Discussion of everyone attending conference

Note: speaker is either the 1st person named or the person underlined.

Thanks to RTI International for co-sponsoring the workshop.

“New Food Safety Incentives & Regulatory, Technological & Organizational Innovations” - 7/22/2006, Long Beach, CA (con't)

Workshop objectives

- Analyze how new public policies and private strategies are changing economic incentives for food safety,
- Showcase frontier research and the array of new analytical tools and methods that economists are applying to food safety research questions,
- Evaluate the economic impact of new food safety public policies and private strategies on the national and international marketplace,
- Demonstrate how new public policies and private strategies in one country can force technological change and influence markets and regulations in other countries, and
- Encourage cross-fertilization of ideas between the four sponsoring sections.

Workshop organizing committee

Tanya Roberts, ERS/USDA, Washington, DC - Chair

Julie Caswell, University of Massachusetts, MA

Helen Jensen, Iowa State University, IA

Drew Starbird, Santa Clara University, CA

Ruud Huirne, Wageningen University, the Netherlands

Andrew Fearne, University of Kent, UK

Mogens Lund, FOI, Denmark

Mary Muth, Research Triangle Institute Foundation, NC

Jayson Lusk, Oklahoma State University, OK

Randy Westgren, University of Illinois, IL

Darren Hudson, Mississippi State University, MI