

**Quality and Quality Assurance in the Fresh Produce Sector:
A Case Study of European Retailers**

Patricia Aust Sterns
Department of Agricultural Economics
Michigan State University
e-mail: austpatr@msu.edu

Jean-Marie Codron
Institut National de la Recherche Agronomique (INRA)
Montpellier, France
e-mail: codron@ensam.inra.fr

Thomas Reardon
Department of Agricultural Economics
Michigan State University
e-mail: reardon@msu.edu

May 15, 2001

Selected Paper, AAEA Annual Meeting
Chicago, IL August 5 – 8, 2001

Abstract

Quality and quality assurance are among the most critical issues facing the fresh produce industry. This paper shows that while quality is widely noted to be an important concept, it is not clearly defined in the literature. Several definitions of quality are presented. The terminology associated with quality assurance is analyzed. An array of quality assurance systems used in the European fresh product sector are presented. Conclusions are drawn that while fresh produce quality will always be a factor retailers use to compete for consumers, there is evidence of industry consensus on some quality attributes, particularly, safety, environmental, and social attributes.

Copyright 2001 by Patricia Aust Sterns, Jean-Marie Codron, and Thomas Reardon. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright appears on all such copies.

Introduction

The global trends of expanded international trade, changing consumer demand, increased public regulation, and significant food safety scares have led to a profound increase in concerns over a broad spectrum of food quality attributes. In reaction to these trends, a proliferation of food quality standards and quality assurance systems have emerged to deal with quality and information problems making quality assurance an increasingly important issue in the global agri-food system. This process has been driven by a number of economic actors including governments, private standards associations, industry groups, non-governmental organizations, and individual firms. However, the proliferation of quality standards and quality assurance systems (also called quality assurance schemes) to manage them is causing confusion and added costs for both retailers and producers (Baines, Davies, and Ryan 2000; Morris and Young 2000) and is compounded with international trade.

Quality is increasingly referred to as an important concept within the agri-food system, yet the concept of quality is not well defined or understood (Morris 2000). The quality debate in both academic and industry circles has become a central issue in the marketing and strategic positioning of fresh commodities like meats and fruits and vegetables. However, inconsistency in the use and meaning of quality is preventing this dialog from moving forward. Thus it is important to clarify what quality means when applied to a quality food product or a food supply chain.

Fresh produce is a strategically important department for retailers as the key image-making and profit-making center (McLaughlin and Perosio). Fresh produce is ranked as the number one store selection criteria for consumers (Crecca 2000) and thus, the handling of fresh

produce is a top priority for retailers (Shulman). These factors, combined with increasing concerns about a broad range of quality attributes, including safety, organoleptic, and environmental and social attributes, have placed quality and quality assurance among one of the key strategic issues in the fresh produce sector. However, little work has focused on quality and quality assurance in the fresh produce sector.

Several questions arise from this situation. How is quality conceptualized in the literature? What is the pattern of adoption of quality assurance systems in the fresh produce sector? Is there an emerging consensus from retailers with respect to quality? These research questions are addressed using a critical case study¹ of British and German retailers.

The paper begins with an analysis of the plurality of definitions of quality in the literature and argues for a broad-based definition of quality. Then the language of quality assurance is analyzed and clarified. Next, the quality assurance systems in the European fresh produce sector are categorized and an assessment of an emerging consensus is presented.

Defining Quality

What is meant by the term quality?

While quality is widely noted in both the academic (Westgren 1999; Noelke and Caswell 2000; Morris and Young 2000) and industry literature (Major 2000; Hollingsworth 2001) as an increasingly important concept, it is not clearly defined or understood. Analysis of quality in economic theory has developed from the product attribute theory of Lancaster (1966) who introduced the concept that goods could be analyzed as bundles of attributes. He concludes that it is not the good itself from which consumers derive utility, but that utility is derived from the

¹ Miles and Huberman define a critical case as a case that permits logical generalization and maximum application of information to other cases. British and German retailers are considered a “critical case” because they are the industry leaders in the implementation of quality assurance systems in the fresh produce sector.

attributes a product possesses. Thus, quality, or a quality product, is often defined in a similar manner, as a bundle of certain attributes.

However, Westgren (1999) asserts that how attributes are classified and what constitutes “food quality” has not fully codified in the literature. He notes that a distinction is often maintained between food quality, food safety, and environmental attributes in the literature and our dialogues about food-system performance. Unnevehr, Miller, and Gomez (1999) make a distinction between quality and safety assurance but there is not a discussion of why quality and safety are treated separately, nor are they defined. Yet Caswell, Bredahl, and Hooker (1998) and Noelke and Caswell (2000) present broad-based definitions of quality that include a full spectrum of attributes including food safety, nutrition, sensory/organoleptic (taste, color, freshness, smell, appearance), value/function (size, packaging, shelf-life), and process (traceability, animal welfare, etc.).

Noelke and Caswell (2000) label these attributes as intrinsic quality attributes, which can be classified further into search, experience, and credence attributes. The distinction between search and credence attributes may differ between different actors in the supply chain. For instance, what may be a credence attribute for consumers (say pesticide residues) can be a search attribute for a retailer or shipper because it is feasible for them to sample and test their products. They also assert that consumers can use extrinsic measurement indicators (e.g. quality management systems, certification, labeling, etc.) and extrinsic cues (e.g. price, brand name, store name country of origin, reputation, and past experience) to evaluate intrinsic attributes and thus, turning a credence attribute into a search attribute.

This broad-based or holistic definition of quality is supported by the work in international bodies, such as Codex, and in other disciplines, particularly rural sociology. A recent Codex

document (2000) defined quality as “the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.” The document explicitly notes that food safety is treated as a component of “food quality.”

As noted by Morris and Young (2000), as well as Noelke and Caswell (2000), the term quality is used and defined differently by different actors in the supply chain, and thus needs to be conceptualized as a social construct. Morris and Young (2000) state, “As other studies concerned with food production and retailing have shown quality is a fluid and socially constructed concept which is constantly created and recreated through the discourses and action of key actors within in the agro-food system.” For example, producers may regard quality as a marketing opportunity while consumers may equate quality with safety and wholesomeness or organoleptic factors like flavor and freshness. National and international regulatory bodies may have a different perspective of quality, relating it to “objective, scientific” measures such as hygiene requirements or good agricultural/manufacturing practices (Ilbery and Kneafsey 1998). This conceptualization of quality extends the Lancaster model beyond just recognizing attributes but also recognizing that the definition of attributes is a complex process with economic ramifications, including income distribution and market access, for all members of the supply chain.

As quality has become a primary focus of supply chain management in many of the large European retailers, quality assurance and quality control have become an integral part of the mass food market. However, one concept traditionally associated with quality (Marsden, 1998; Ibery and Kneafsey 1998), quantity control (or quality limitations), seems to contradict this. A paradox arises from this “new economics” of quality, which includes a notion of “quality and quantity” rather than “quality verses quantity” (Morris 2000). This paradox challenges our current

conceptions of niche marketing. If Sainsbury includes social and environmental factors in its QAS for ALL of its own label products (this includes all non-branded fresh produce), is it niche marketing? The price premium (if any) is captured by the Sainsbury brand name and not a “labeled” attribute. As a quality orientation permeates the mass market, our traditional notions of “mass” marketing and “niche” marketing may need to be reconsidered.

Since there is no “standard” definition of quality in the literature, the following conceptualization is proposed. Following from the holistic definition of Caswell, Bredahl, and Hooker (1998) as well as common usage in the industry literature and the Codex definition, we adopt a broad-based definition of quality, with attributes classified as food safety, nutritional, organoleptic, value, environmental, and social.

How is quality assured?

The objective of quality assurance is to ensure that a food product meets a particular set of standards with respect to the product itself as well as the processes of production, distribution, and processing. However, just as quality is not clearly defined in the literature, the terminology of quality assurance is inconsistent and at times confusing. A variety of terms have been used interchangeably adding confusion to the already imprecise concepts of quality and quality assurance. Among the terms used are quality metasystems (Caswell, Bredahl, and Hooker 1998), quality management systems (Noelke and Caswell 2000), quality assurance (Unnevehr, Miller, and Gomez 1999), quality assurance system (Morris 2000), quality assurance schemes (Morris and Young 2000; Morris 2000), quality systems (Canavai, Regazzi, and Spadoni 1998), and farm assurance (Morris and Young 2000; Baines, Davies, and Ryan 2000). As noted, several of the terms are often used interchangeably without explanation or clarification.

Caswell, Bredahl, and Hooker (1998) introduce the concept of food quality metasystems

to the literature. Food quality metasystems are defined as all strategies that affect quality attributes and are implemented through more specific metastandards. Metasystems are usually general in nature and therefore apply widely across firms in the supply chain unlike sector-specific or product-specific standards. Three important characteristics of metasystems are identified, certification audit, documentation of practices, and implementation and approval. However, several of the examples given, including proprietary quality assurance schemes and HACCP, do not meet the definition and/or requirements outlined.²

The most frequently used terms are quality assurance systems and quality management systems. Using ISO vocabulary, Codex defines quality assurance as “all those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.” A quality assurance system is defined as the “organizational structure, procedures, processes and resources needed to implement quality assurance.” In the management literature, a distinction is drawn between quality assurance systems and quality management systems. Quality management systems incorporate quality assurance as well as the required management principles to drive continual improvements (Skrabee 1999). Additionally, quality management systems entail the involvement of everyone in an organization, from the Chief Executive down, in the continuous improvement of products and processes. For clarity and consistency, the terms quality assurance and quality assurance system (QAS) are used in this paper according to the Codex definitions cited earlier.

Just as there are a variety of criteria used to define a quality, there is also diversity in the systems used for quality assurance. While there are a number of categories of systems for quality

² By definition, proprietary quality assurance schemes are not applicable widely across firms. Also, for strategic purposes, they are usually not third party certified. Similarly, while HACCP may be a part of a third party certified quality assurance system, it is not a necessary condition of HACCP implementation.

control, ranging from general good agricultural practices/good manufacturing practices to specialty labels (like fair-trade labels) to full quality management systems (like Total Quality Management). Quality assurance systems are the predominate form of quality control in the fresh produce sector and the remaining analysis in this paper will focus on them. QAS can be classified into three broad categories based on how the standards within the system are set and how it is applied and managed. QAS will have different objectives depending on who controls them (Morris 2000).

1. *Firm-specific quality assurance systems* are defined and managed at the individual firm level. For proprietary control, they are audited by retailers' quality control staff. Examples include, Tesco's "Nature's Choice" and Sainsbury's "Integrated Crop Management System" and its new "Taste the Difference" line of products (including fruits and vegetables).
2. *Industry quality assurance systems* are defined and managed at the retail industry level. These systems are usually third party audited for consistency and transparency. Currently, industry level QAS can be classified into two groups, retail-led QAS and producer-driven QAS. For the purposes of this paper, analysis of this category is limited to retail-led QAS (see the following section for further explanation). Examples include Eurep GAP 2000, the Global Food Safety Initiative, the Ethical Trading Initiative (ETI), and the British Retail Consortium (BRC) system.
3. *Generic-international quality assurance systems* are defined and managed by independent standards organizations.³ They are similar to Caswell, Bredahl, and Hooker's (1998) metasystems. Third party audits are usually required. Examples include ISO 9000, ISO14000, and SA 8000 (Social Accountability 8000).

Quality Assurance in the Fresh Produce Sector

This section and the following section are based on a case study of retailers in the United Kingdom and Germany. Data for the case study was collected through in-depth interviews with quality assurance managers and marketing managers in the leading retailers in each country as well as industry publications and relevant academic literature. Interviews were conducted using a semi-structured interview guide and ranged in length from one to three hours. While the research is still ongoing⁴, tentative conclusions are presented.

Even though the fresh produce sector has seen a proliferation of quality assurance systems emerge from different actors in the supply chain (farmers, NGOs, etc), the retailers have emerged as the driving force in defining quality and implementing (i.e., requiring suppliers to implement) quality assurance systems (Morris and Young 2000). This is due to market power arising from market concentration, a consumer gatekeeper role, and a comparative advantage in logistics.

Market concentration: Over the last decade, market concentration in the European retail sector has increased dramatically. A recent EU-commissioned study found a wide range in the five-firm concentration ratios in European countries. The ratios ranged from 30 percent in Italy to 96 percent in Finland. The ratios of the three largest retail markets, Germany, France, and the United Kingdom were reported as 75.2 percent, 67.2 percent, and 67 percent, respectively (Dobson Consulting 1999).

Gatekeeper role: Retailers act as a primary gatekeeper to the majority of consumers. They control the access to final consumers as well as to information regarding their product

³ The one exception to this in the examples is HACCP.

⁴ Additional interviews and follow-up interviews are planned for May and June 2001 to confirm current data and allow more in-depth discussion of critical topics.

preferences and purchasing patterns. Retailers are one of the key actors in the supply chain with a direct relationship with consumers.

Comparative advantage in logistics: With expanded international trade, retailers now sell fresh produce from all parts of the world. Consumers now expect a wide variety of fresh produce year-round. Thus, retailers have developed sophisticated marketing and logistics systems to manage an increasing global supply chain.

A variety of QAS have been adopted to manage particular product attributes. While each firm is unique, the industry as a whole is following a similar “patch work” pattern of QAS adoption and implementation. In other words, several different quality assurance systems are adopted and pieced together to obtain a satisfactory level of control for each attribute of quality. Table 1 summarizes the current array of quality assurance systems, including retailers’ attitudes about each system.

Toward a Global Consensus on Quality?

Given the marketing advantages and disadvantages associated with the quality assurance systems, is there a movement toward a global consensus on quality? While much of the focus in the literature has been on the vertical linkages necessary for quality assurance (Barkema, Drabenstott, and Welch; Caswell, Bredahl, and Hooker 1998; Morris and Young 2000), horizontal linkages are emerging as an important trend. By examining two examples of horizontal cooperation, or collective action, at the retailer level, we will see that there is some evidence of convergence at the industry level for setting minimum quality standards.

Eurep GAP 2000. Eurep GAP 2000 (Euro Retailers Produce Working Group Good Agricultural Practice) is a code of practice for fresh produce production developed by the Euro Retailers Produce Working Group. This group consists of 22 European retailers. Eurep GAP

2000 is a fairly new initiative with implementation and certification of suppliers to begin in 2001. Suppliers must either adopt the code of practice or demonstrate that their firm-specific or group-specific QAS (like Assured Produce in the UK) are equivalent to GAP 2000. Third party certification is also required. The primary product attribute addressed by the code is the environmental impact of fruit and vegetable production through mandating an integrated production system. Other attributes, include safety and social factors, are also addressed, but not as specifically as the environmental factors. (EUREP 2000).

The Global Food Safety Initiative. The Global Food Safety Initiative is a network of food safety experts from retail companies and their trade associations. While the membership is heavily European, it has members from around the world.⁵ The Initiative is coordinated by CIES – The Food Business Forum, which is a trade association based in Paris. The objectives of the initiative are to

- Establish criteria for global food safety standards for suppliers and supplier audits
- Developing rapid alert systems
- Encouraging world-wide government cooperation with national and international governments
- Promoting consumer education

The details of the Initiative are currently in process and will be launched at the CIES Annual Executive Congress in June 2001. The core component of the Initiative has been to establish criteria for CIES endorsement of different quality assurance systems. This will ensure that the core elements outlined in the criteria are covered by all systems that gain endorsement. This will reduce the transaction costs of international trade for retailers because they will not

⁵ Members include representatives from the major global retailers as well as the Food Marketing Institute, the British

have to spend extensive periods of time assessing foreign producers' quality assurance systems and/or imposing their own firm-specific system. Third party audits are among the core criteria.

The convergence of quality assurance and quality assurance systems at the industry level has been driven by several factors. Baines, Davies, and Ryan (2000) identify several costs associated with the proliferation of quality assurance systems. First, there are significant costs in evaluating whether or not a particular system meets the quality standards of the firm as well as national regulatory standards. Second, in addition to the cost of auditing systems, a significant amount of management and technical resources is taken up by the assessment of various systems to determine what is being assured and how this is achieved. Interview data suggests that industry level QAS emerge as the preferred system for quality assurance, and thus, an emerging industry consensus on some quality attributes. Table 2 show a balancing of the "plusses and minuses" of the different types of QAS.

Conclusions

In the coming years, quality and quality assurance will clearly continue to be a critical issue for industry participants, policy makers, and researchers. This paper has shown that while quality is widely noted to be an important concept, it is not clearly defined in the literature. Several definitions of quality are presented and we adopt a broad-based definition of quality, with attributes classified as food safety, nutritional, organoleptic, value, environmental, and social. With regard to quality assurance and quality assurance systems, a variety of terms have been used interchangeably creating confusion and making comparison across studies difficult. Future research in this area should pay close attention to the terminology used. To increase

comparability across studies, Codex and ISO vocabulary should be used and where supplements and changes are deemed necessary, the reasoning should be noted.

In the European fresh produce sector, a proliferation of quality assurance systems has and is emerging from different actors in the supply chain. However, retailers have emerged as the driving force in defining quality and implementing quality assurance systems due to market power arising from market concentration, a consumer gatekeeper role, and a comparative advantage in logistics.

While fresh produce quality will always be a factor retailers use to compete for consumers, there is evidence of industry consensus on some quality attributes, particularly, safety, environmental, and social attributes. This trend is exemplified best by two recent retail-led industry initiatives, Eurep GAP 2000 and the Global Food Safety Initiative.

References

- Baines, R.N., W.P. Davies, and P. Ryan. "Reducing Risks in the Agri-Food Supply Chain – Co-Recognition of Food Safety Systems or a Single Global Scheme." IFAMA paper, June 2000.
- Barkema A., M. Drabentstott, and K. Welch. "The Quiet Revolution oin the U.S. Food Industry." Federal Reserve Bank of Kansas City. *Economic Rev.* (May/June 1991): 25-41.
- Caswell, J.A., M.E. Bredahl, and N.H. Hooker. "How Quality Management Metasystems Are Affecting the Food Industry." *Rev. Agr. Econ.* 20(Fall/Winter 1998): 547-57.
- Codex Alimentarius Commission. "Proposed Draft Guidelines for the Utilization and Promotion of Quality Assurance Systems to Meet Requirements in Relation to Food." CODEX Committee on Food Import and Export Inspection and Certification Systems, Joint FAO/WHO Food Standards Programme, CX/FICS 00/5, August 2000.
- Crecca, D.H. "Doing bananas right." *Supermarket Business* supp. (Nov 2000): 13-14.
- Hollingsworth, J. "Going Global." *Supermarket Business* 56(Mar 2001): 79.
- Ibery, B. and M. Kneafsey. "Product and place: promoting quality products and services in the lagging rural regions of the EU." *European Journal of Urban and Regional Studies* 5(1998): 329-341.
- Marsden, T. "New rural territories: regulating the differentiated rural spaces." *Journal of Rural Studies* 14(1998): 107-117.
- Major, Meg. "Qualifying vendors." *Supermarket Business* 55(April 2000): 211.
- McLaughlin, E. and D. Perosio. 1994. "Fresh Fruit and Vegetable Procurement Dynamics: The Role of the Supermarket Buyer." Cornell Food Industry Management Program Working Paper R.B. 94-1.
- Miles, M.B. and A. M. Huberman. 1994. *Quantitative Data Analysis: An Expanded Sourcebook*. 2nd Edition. Thousand Oaks, CA: Sage Publications.
- Morris, C. "Quality assurance schemes: A new way of delivering environmental benefits in food production?" *Journal of Environmental Planning and Management* 43(May 2000) 433-448.
- Morris, C. and C. Young. "'Seed to shelf', 'teat to table', 'barley to beer' and 'womb to tomb': discourses of food quality and quality assurance schemes in the UK." *Journal of Rural Studies* 16(2000) 103-115.

Noelke, C.M. and J.A. Caswell. "A Model of the Implementation of Quality Management Systems for Credence Attributes." Selected Paper, AAEA Annual Meetings, Tampa, Florida, July 30 – August 2, 2000.

Shulman, Richard. "Perishable systems take center stage." *Supermarket Business* 56(April 2001): 47-48.

Skrabee, Q.R. "Quality assurance revisited." *Supply Management* 41(Nov/Dec 1999): 6-9.

Unnevehr, L.J., G.Y. Miller, and M.I. Gomez. "Ensuring Food Safety and Quality in Farm-Level Production: Emerging Lessons Form the Pork Industry." *Amer. J. Agri. Econ.* 81 (Number 5, 1999): 1096-1101.

Westgren, R.E. "Delivering Food Safety, Food Quality, and Sustainable Production Practices: The Label Rouge Poultry System in France." *Amer. J. Agri. Econ.* 81 (Number 5, 1999): 1107-1111.

Table 1: Current Array of Quality Assurance Systems

Quality Assurance System	Attribute Managed	Implementation	Advantages	Disadvantages
Firm-specific QAS	Varies among firms: Environment Food Safety Social Value Organoleptic	Mandatory for all suppliers - seen as a minimum quality standard. Used to back up quality differentiation	High degree of control Flexible	Costly to implement and maintain
BRC	Food Safety Value Organoleptic	Mandatory minimum for all suppliers	Reduces auditing costs Objectivity (3 rd party audits) Includes food safety component (HACCP)	Not as flexible as firm-specific QAS
Eurep GAP 2000	Environment Food Safety Social	Mandatory minimum for all suppliers	Internationally recognized 3 rd party audited Reduces monitoring and auditing costs Specifies production practices	Not flexible Difficult to standardize auditing across countries
ETI	Social	Mandatory for suppliers from developing countries	Guarantees a certain standard for working conditions Credibility (3 rd party audits)	Difficult to implement
HACCP	Food Safety	Mandatory minimum for all suppliers (usually included in firm-specific QAS)	Good foundation for food safety	Difficult to implement from “farm to fork”
ISO 9000	Quality	Voluntary	Good foundation for a quality system	Does not guarantee output quality (only system quality) Expensive to implement Too generic
ISO 14000	Environment	Voluntary	Good foundation for an environment system	Does not guarantee a certain level of benefits. Does not specify particular production practices (like IPM)
SA 8000	Social	Voluntary	Guarantees a certain standard for working conditions Credibility (3 rd party audits)	New and potentially difficult to implement

BRC: British Retail Consortium

Eurep GAP 2000: Euro Retailers Produce Working Group Good Agricultural Practice

ETI: Ethical Trading Initiative

SA 8000: Social Accountability 8000

Table 2: Key Factors of Different Types of Quality Assurance Systems (QAS)

Factor	Firm-specific QAS	Industry QAS	Generic International QAS
Degree of control	+++	++	+
Cost/Administrative burden	- - -	-	-
Legitimacy/objectivity	+	+++	+++
Specificity of factors controlled	+++	+++	+
Transparency	+	+++	+++