



Private sector management of food safety: public regulation and the role of private controls

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Abstract

Private sector responses to the challenge of managing food safety are explored. This paper clarifies the objectives of this special issue, introducing the key issues in each of the following articles. The degree and manner of regulatory compliance, an important element of any strategic food safety management decision, are discussed. Separate of the response to regulations, the incentives of firms to implement advanced management systems are documented. The paper pays particular attention to firm efforts to minimize the potential for product recalls. © 2001 Elsevier Science Inc. All rights reserved.

1. Introduction

This paper serves as an introduction to this special issue on the management of food safety. More specifically, it aims to highlight a number of issues in the private sector, particularly in the context of food safety regulation, many of which are addressed in the following papers. In so doing the paper does not claim to be exhaustive, or to assert that the issues that are discussed are the most important ones. Indeed, there are a multitude of issues associated with the manner in which private enterprises manage food safety and respond to the regulatory environment that is laid down to control the safety of the products they sell. In many cases, however, these issues are not fully understood. Indeed, until relatively recently there had been

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little attention paid to the management of food safety by the private sector. Rather, most researchers concentrated on the need for regulation without explicit consideration of the enterprises that were being regulated.

This paper, and the following articles address a number of key issues associated with private sector management of food safety. A major theme of the papers is the management of food safety and other quality characteristics throughout the supply chain. Fearné, Hornibrook, and Dedman (2001) examine and compare the quality assurance schemes applied to the beef supply chain in UK, Germany and Italy. Northen (2001) further examines the role of farm assurance schemes in signaling the quality of fresh meat to multiple food retailers in the UK. Smyth and Phillips (2001) examine systems of identity preserving production and marketing (IPPM) in the Canadian canola sector. Finally, Sparling, Lee, and Howard (2001) provide a case study of the application of Hazard Analysis and Critical Control Point (HACCP), ISO 9000 and ISO 14000 in the Canadian agricultural sector. A second theme is the supply- and demand-side impact of food safety-related controls. Hayes, Jensen, Backstrom, and Fabiosa (2001) examine the consequences of a ban on use of antibiotics in pig production on production costs and the market price of pork in the United States. Thirdly, the firm-level impact of failures in food safety is examined. Specifically, Skees, Botts, and Zeuli (2001) examine the potential impact of food-safety-related product recalls in the food processing sector and the potential impact of recall insurance.

A major theme of this paper is the processes by which firms comply with food safety regulations, drawing heavily on the relatively abundant literature on compliance with environmental regulations. The aim of this part of the paper is to highlight the strategic nature of compliance decisions. To provide a link with a number of the following papers, the role of private food safety controls is discussed, and an attempt made to link adoption of these systems to the requirements of public regulation from the perspective of the firm. Finally, there is a discussion of the firm-level implications of food safety failures, in particular product recalls.

2. Compliance decisions

The conventional view of regulation involves the issue of firm-level compliance. Indeed, the process of compliance is viewed as a black box with little attempt to explore and understand the processes by which firms, do or do not, comply with regulatory requirements (Macaulay, 1993). Thus, regulatory agencies are seen as making rules with which firms must comply. Those firms are then assumed to learn of these rules, understand what they must do in order to comply, and take any necessary action. Whilst some firms may fail to take this action, either because of ignorance or attempts at evasion, enforcement action comes into play in order to impose sanctions on those that violate these rules. In turn, these actions serve to deter other firms from evasion. This rather simplistic view of the regulatory process is, however, far from reality (Hawkins & Hutter, 1993).

A series of factors simultaneously act to encourage firms to supply safe food. More specifically, these take the form of ‘negative incentives’ in the form of adverse consequences for supplying unsafe food products (Buzby, Frenzen, & Rasco, 2001)

- **Market forces:** In the event that an unsafe product is supplied to the market and an outbreak of disease occurs and/or consumers become aware that unsafe products have been supplied the firms may experience a loss of reputation and associated brand equity, market share and sales revenue.

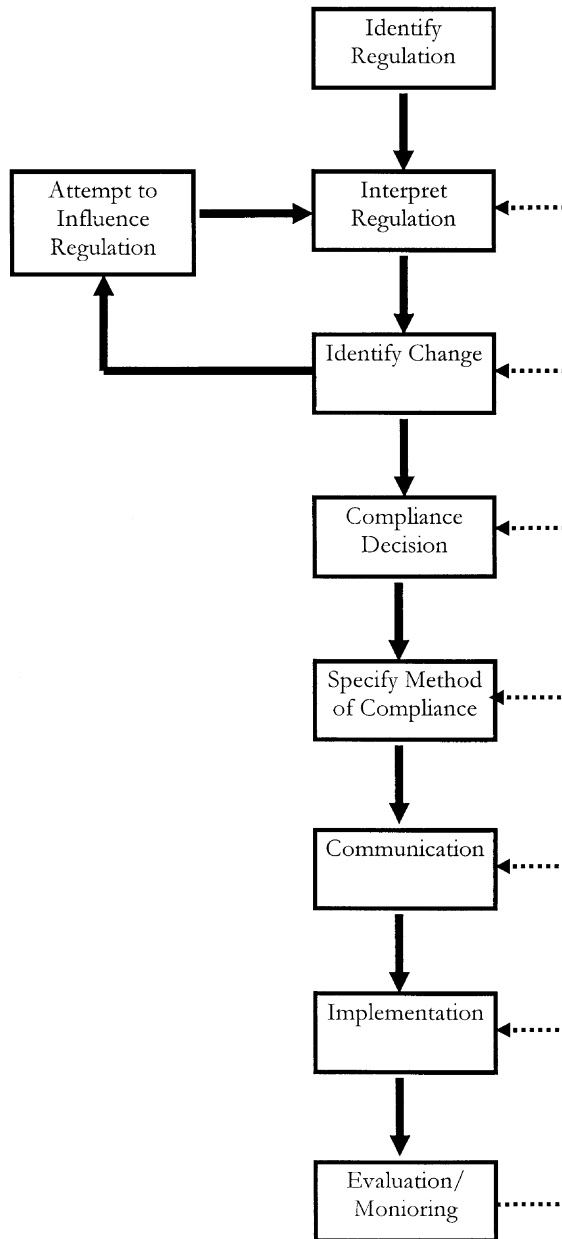


Fig. 1. Process of compliance with food regulations.

- **Food safety regulations:** Firms that violate food safety regulations may be subject to a range of penalties including fines, product recalls and temporary or even permanent restrictions on their activities. Negative publicity associated with non-compliance with food safety regulations can further enhance the market forces detailed above.
- **Product liability law:** Firms that supply unsafe food products risk legal claims under product liability law in the event that consumers actually suffer harm. The costs associated with product liability cases can be considerable, including financial compensation, court costs and legal fees, the later of which may be incurred regardless of the outcome of the case. Negative publicity associated with product liability cases, whether successful or not, can further enhance the market forces detailed above.

Thus, the food safety controls implemented by firms and the level of product safety that they deem to be acceptable will reflect the inter-play of these factors and further variables such as their level of risk adversity, financial situation, etc.

There have been a number of attempts to model firm-level compliance decisions in order to better understand the propensity of firms to comply with regulatory requirements. Baron and Baron (1980) construct a probabilistic model relating the probability of compliance to the ease and perceived urgency of compliance and regulatory uncertainty. Cole and Sommers (1981) develop a compliance decision tree that incorporates the action taken by firms and the response by enforcement agencies. Henson and Heasman (1998) develop a model of compliance with food regulations based on in-depth interviews with food processing enterprises in the UK. The model aims to highlight the multiple stages through which a representative firm complies with food regulations (Fig. 1).

3. Strategic response to food safety regulations

The interrelationship between the regulatory activities of government and the strategic behavior of firms is well recognized (Caswell & Johnson, 1991; Henson & Heasman, 1998). On the one hand, regulation is a major element of the environment in which firms operate and can constrain the strategic behavior of firms, particularly in heavily regulated sectors such as food manufacturing and distribution (Porter, 1980; Porter & van der Linde, 1995). On the other hand, capture theory suggests that firms may attempt to co-opt the regulatory process in an attempt to gain strategic advantage (Stigler, 1971; Peltzman, 1976). This can occur at the level of the individual firm or the industry through, for example, interest groups.

There is a paucity of studies that examine the impact of food safety regulations on industrial performance and firm strategies (with the exception of Starbird (2000) and many of the papers in this special issue). However, studies of the impact of environmental regulations provide some useful indicators of probable effects. This literature provides a variety of perspectives on the impact of environmental regulations. At one extreme, Walley and Whitehead (1994) suggest that firms rarely benefit from environmental regulations because the necessary investments generally yield negative returns and, in turn, loss of shareholder value. At the other, Porter (1990, 1991) and Porter and van der Linde (1995) argue that the potential for ‘innovation offset’ can generate first mover advantages in the

		Driver of Compliance Behaviour	
		Contribution to Industrial Performance	Administrative Enforcement
Net Economic Benefits of Compliance	High	Performance-driven compliance	Enforcement-driven compliance
	Low	Non-compliance	Conditional non-compliance

Fig. 2. Strategic response to environmental regulations.

form of enhanced product quality or lower costs of compliance for firms that comply early with environmental regulations.

Rugman and Verbeke (1998a,b) present an organizing framework that classifies the literature on corporate strategy and environmental regulations (Fig. 2). The horizontal axis depicts the trade-off between the impact of environmental regulations on industrial and environmental performance. The vertical axis distinguishes between dynamic and static managerial perspectives. The former is associated with longer-term perspectives on the effects of environmental regulations, whilst the latter refers to static perspectives that focus on immediate impacts. This provides four basic scenarios, as follows:

- In Quadrant A, regulations are imposed on firms that are required to comply but see little or no benefits from improved environmental performance. In this situation, firms do not invest in environmental capacity beyond that required by regulations.
- In Quadrant B, firms take a longer-term view of the impacts of environmental regulations. In this situation, firms aim to minimize the perceived negative impact of environmental regulations on performance.
- In Quadrant C, environmental performance is positively related to business performance, for example because of market demand and/or other external forces. In this situation, firms will voluntarily invest in environmental capacity.
- In Quadrant D, firms take a long-term perspective on the relationship between environmental regulation and business performance. For example, firms may regard new or anticipated regulations as an opportunity to gain competitive advantage through ‘innovation offset.’

This framework suggests that environmental regulations can have a wide of effects at the firm-level, although it may be unclear ex ante what these effects might be (Rugman & Verbeke, 1998a,b). In particular, there may be uncertainty as to whether environmental and industrial performance is complementary or conflicting.

The relationship between regulatory compliance and business performance reflects the firm-level capabilities and resources of individual firms. This suggests that regulations can provide selective advantages to advantageously situated firms. For example, there is

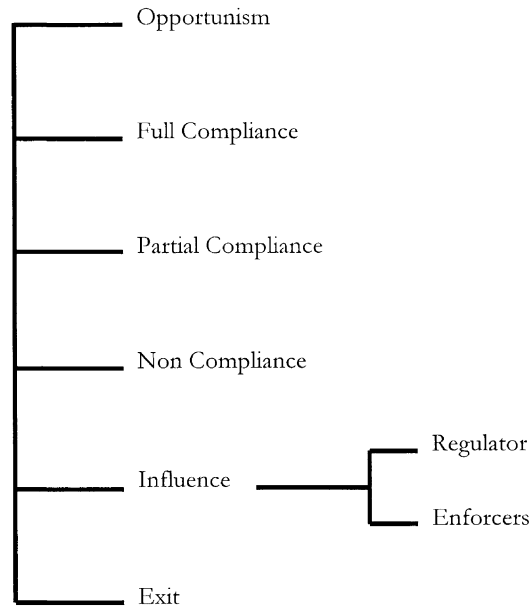


Fig. 3. Alternative compliance strategies.

evidence of economies of scale in compliance with many regulations that benefit larger firms. Likewise, firms that possess particular technologies or specialized expertise may achieve benefits over competing firms.

The literature on compliance decisions suggests firms adopt a ‘compliance culture’ that, whilst reflecting the balance of costs and benefits of compliance, determines the predominant compliance strategy that is adopted (see for example Henson & Heasman, 1998; Sproull, 1981). The alternative compliance strategies are summarized in Fig. 3 (Marcus, 1984).

The options in Fig. 3 acknowledge that firms have strategic choices in responding to regulation. They can ‘fight all of the way’ and ‘only do what is required’ or ‘be progressive’ and ‘lead the industry.’ These extreme responses have been characterized as ‘reaction and defense’ or ‘accommodation and pro-action’ (Marcus, 1984). More generally they are referred to as stonewalling, the use of public relations and public and administrative processes to buffer the corporation from the uncertainties of regulatory change, and opportunism, the effort to transform regulatory constraints into opportunities for gain. In practice, firms rarely employ pure strategies such as these, but adopt mixed approaches that shift between stonewalling and opportunism at different points in time and in response to alternative forms of regulation. The choice of compliance strategy will reflect both the nature of the firm, for example size, organizational structure and managerial objectives, and a variety of external factors, for example the level of existing regulation and the speed of change in regulatory requirements (Marcus, 1984).

Recognizing and seizing the opportunity provided by government regulation represents one of the most active and positive responses. In this strategy the firm enthusiastically complies with the requirements laid down by the regulation and may even lead efforts to get

others to comply, in an effort to improve its competitive position. A common approach is to pre-empt regulation, introducing higher standards in anticipation of future regulatory requirements, yielding first mover advantage. The major uncertainty associated with this strategy is the success of the opportunities seized by the firm. Immediate and full compliance may or may not result in competitive advantage for the firm. Pre-empting a regulation may actually reduce competitiveness if there are last minute changes to the regulation that were not anticipated and the firm has already invested significant resources in compliance.

The intermediate strategies all involve quiet compliance with the regulation to differing degrees. Whilst the level of compliance is a continuum, three alternative levels of compliance are presented as illustrations. The level of compliance will reflect the firm's predictions of the nature and level of compliance costs on the one hand and the costs of non-compliance on the other. The costs of non-compliance will reflect the level of enforcement action and the costs imposed on the firm should it be found guilty of non-compliance, including any penalties applied by the courts, the costs associated with litigation plus the costs of then having to comply. Presumably, as the degree of compliance declines, the compliance costs actually imposed on the firm will decline, but the potential costs of non-compliance will increase. Firms that choose zero compliance will have devoted no resources to compliance but will face the greatest risk from enforcement action.

Challenging a regulation is a classic example of stonewalling (Marcus, 1984). For example, the firm may dispute the need for or legitimacy of a new regulation, whilst in other less extreme cases it may challenge the action required to comply with the regulation. This strategy will permit the firm to delay any compliance activities, although the costs of such negotiations may be significant, particularly if involving litigation. Presumably, should the firm lose its case, it will have to comply fully with the regulation.

Finally, the firm may exit the market, ceasing all activities that are subject to the new regulatory requirement. At the extreme this may involve ceasing trading altogether. However, short of that extreme, firms may move into different markets or adapt their products so they do not fall under the jurisdiction of the new regulation. This strategy is generally very costly and will only be considered in cases where the costs of compliance or non-compliance are prohibitive.

4. Private food safety controls

The food supply chain has responded to demands for enhanced levels of food safety, both from public regulation and market requirements, through the introduction of more sophisticated systems of quality management, including the application of food safety/quality metasystems (Caswell, Bredahl, & Hooker, 1998). Examples include Hazard Analysis and Critical Control Point (HACCP) and statistical process control (Caswell & Hooker, 1996). The increasing application of such systems reflects the economic and social incentives faced by individual businesses that operate within the food supply chain. Certain of these incentives may be common to all firms that operate in a particular sector, for example regulatory developments, whereas others may be business-specific, for example the requirements of major customers.

The incentives for food suppliers to implement more sophisticated food safety controls such as HACCP operate at two levels (Henson & Caswell, 1999; Segerson & Miceli, 1998; Segerson, 1999). First, they can be market-driven, through, for example, demand-side shifts linked to enhanced reputation or supply-side shifts linked to improvements in efficiency. Second, controls can be mandated by public food safety regulations governing production processes or end-product safety, or liability legislation. In many circumstances these incentives are both interrelated and operate simultaneously, and the controls implemented by individual businesses will reflect the inter-play between them (Henson & Northen, 1997, 1998).

In many cases the implementation of food safety controls such as HACCP is undertaken as a form of self-regulation or to achieve third-party certification. Self-regulation includes internal control systems that assure product safety, where the company sets, monitors, and self-certifies the control parameters. It can take place at the level of the individual firm or be instituted by trade organisations that encompass a significant proportion of the total market supply. Certification involves the setting of food safety standards and their monitoring and certification by parties outside the firm, for example customers, industry trade associations, or private or public standards-setting/certification agencies. Such certification may be voluntarily sought by the company or required by those with whom it does business.

The impact of market- and regulatory-based incentives on adoption of food safety controls will depend on perceptions of internal costs and benefits of adoption versus non-adoption (Caswell et al., 1998), as well as the potential for improvements in industrial performance (for example, market share, profitability, etc.) (Rugman & Verbeke, 1998b). In turn, this will reflect, for example, the characteristics of the firm, its objectives, the type of product it manufactures, and the environment in which it operates. For example Henson and Holt (2001) indicate that the adoption of HACCP in the UK dairy-processing sector has been motivated by a number of broad regulatory and market-based incentives. First, improvements in internal efficiency relating to reduced product wastage and improved product quality. Second, direct requirements imposed on businesses by regulatory agencies and major customers. Third, the need to be recognized as conforming to best practice, to meet third-party accreditation of customers and/or because it is recognized to be the industry standard of ‘good practice.’

5. Impact of food safety failures and product recalls

In the event of a food safety failure, the impact on suppliers can be significant, particularly where products are recalled from the market. Recalls can take a number of forms. In some instances they may be required by regulatory agencies. In others, firms may recall their products voluntarily, either because of the threat of regulatory action or to minimize the impact of failures of product safety.

In the event of a recall, firms involved can potentially incur significant costs, which can translate into a loss of share market valuation (Salin & Hooker, 2001). First, there may be costs associated with the recovery and disposal or reprocessing of potentially contaminated products that have already been placed on the market. Second, in the event that cases of

food-borne illness actually occur, the firm may face costs from liability claims and/or enforcement proceedings. Finally, negative publicity can reduce market demand and a loss of brand capital. Consequently, the costs associated with product recall are complex, can extend into the long term and are potentially significant.

The most common measure of the economic impact of product recalls on publicly traded firms is the resultant impact on share prices. A number of studies have explored the impact of recalls in a variety of industries including automobiles (Pruitt, Reilly, & Hoffer, 1986) pharmaceuticals (Dranove & Olsen, 1994) and consumer products (Pruitt & Peterson, 1986; Davidson & Worrall, 1992). Thomsen and McKenzie (2001) assess the impact of recalls on suppliers of meat and poultry products in the United States over the period 1982–1998. Recalls associated with a potentially serious food safety hazard are found to have a significant negative impact on share values of implicated firms. However, there is no evidence of negative stock market reactions to recalls involving less severe food safety hazards. Henson and Mazzocchi (forthcoming) examine the impact of a government announcement of a possible link between BSE and human health on the share value of corporations involved in the meat and dairy sectors in the UK in 1996. The announcement is found to have a significant impact on share values of corporations in a wide range of product sectors.

It has been suggested that recall insurance could provide a mechanism through which firms can offset the potential costs associated with recalls (Buzby et al., 2001). Many firms are insured against the costs associated with recalls, and in particular the potential costs of litigation and damages. In such circumstances, however, the economic incentives for firms to produce safe food are limited to the value of lost brand capital. In addition, firms with a history of recalls may face escalating insurance premia and/or may be refused insurance cover. Skees et al. (2001), in this special issue, however, argues that recall insurance can motivate earlier recalls and/or the adoption of more effective food safety management systems such as HACCP.

6. Conclusions

This paper has sought to provide an overview of selected issues associated with private sector management of food safety. It has concentrated in particular on the nature of compliance decisions, strategic response to food safety regulation and the potential impact of food safety failures. The role of private food safety controls is also explored, with emphasis on the relationships between regulation and adoption of private control measures, although this issue is examined in more detail in a number of the other papers in this special issue.

Currently, there is a paucity of research on private sector response to food safety regulation and thus much of this paper draws on the more general literature on regulatory compliance and previous studies in the areas of, for example, environmental regulation. That research has been undertaken typically focuses on the adoption of private controls, rather than exploring the wider strategic response, including the degree and manner in which firms comply with regulatory requirements and the consequent impact on their competitive

position. Nevertheless, such issues are an important factor influencing the impact of food safety regulations and the actions of private businesses to manage food safety. This special issue throws some light on this, but it also serves to highlight the need for further research on this issue.

References

- Baron, B., & Baron, P. B. (1980). A regulatory compliance model. *Journal of Contemporary Business*, 9, 139–150.
- Buzby, J. C., Frenzen, P. D., & Rasco, B. (2001). *Product liability and microbial food-borne illness*. Washington, DC: Economics Research Service, US Department of Agriculture.
- Caswell, J. A., Bredahl, M. E., & Hooker, N. H. (1998). How quality management metasystems are affecting the food industry. *Review of Agricultural Economics*, 20(2), 547–557.
- Caswell, J. A., & Hooker, N. H. (1996). HACCP as an international trade standard. *American Journal of Agricultural Economics*, 78(3), 775–779.
- Caswell, J. A., & Johnson, G. V. (1991). Firm strategic response to food safety and nutrition regulation. In J. A. Caswell (Ed.), *Economics of food safety* (pp. 273–297). New York: Elsevier.
- Cole, R. J., & Sommers, P. (1981). Business and government regulation: A theory of compliance decisions. *Journal of Contemporary Business*, 10(1), 143–153.
- Davidson, W. N., & Worrell, D. L. (1992). The effects of product recall announcements on shareholder wealth. *Strategic Management Journal*, 13, 467–473.
- Dranove, D., & Olsen, C. (1994). The economic side effects of dangerous drug announcements. *Journal of Law and Economics*, 37, 323–348.
- Fearne, A., Hornibrook, S., & Dedman, S. (2001). The management of perceived risk in the food supply chain: A comparative study of retailer-led beef quality assurance schemes in Germany and Italy. *International Food and Agribusiness Management Review*.
- Hayes, D. J., Jensen, H. H., Backstrom, L., & Fabiosa, J. (2001). *International Food and Agribusiness Management Review*.
- Henson, S. J., & Caswell, J. A. (1999). Food safety regulation: An overview of contemporary issues. *Food Policy*, 24, 589–603.
- Henson, S. J., & Heasman, M. (1998). Food safety regulation and the firm: Understanding the compliance process. *Food Policy*, 23(1), 9–23.
- Henson, S. J., & Mazzocchi, M. (forthcoming). Impact of bovine spongiform encephalopathy on agribusiness in the United Kingdom: Results of an event study of equity prices. *American Journal of Agricultural Economics*.
- Henson, S. J., & Northen, J. (1997). Public and private regulation of food safety: The case of the UK fresh meat sector. In G. Schiefer, & R. Helbig (Eds.), *Quality management and process improvement for competitive advantage on agriculture and food*. University of Bonn.
- Henson, S. J., & Northen, J. (1998). Economic determinants of food safety controls in the supply of retailer own-branded products in the UK. *Agribusiness*, 14(2), 113–126.
- Macaulay, S. (1993). Business adaptation to regulation: What do we know and what do we need to know? *Law and Policy*, 15(3), 259–270.
- Marcus, A. A. (1984). *The adversary economy: Business responses to changing government requirements*. Westport: Quorum Books.
- Northen, J. R. (2001). Using farm assurance schemes to signal safety to multiple retailers. *International Food and Agribusiness Management Review*.
- Peltzman, S. (1976). Toward a more general theory of regulation. *Journal of Law and Economics*, 12, 211–240.
- Porter, M. E. (1990). *Competitive advantage of nations*. New York: Free Press.
- Porter, M. E. (1991). America's green strategy. *Scientific American*, 4, 168.
- Porter, M. E., & van der Linde, C. (1995). Towards a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, 2(4), 97–118.

- Pruitt, S. W., & Peterson, D. R. (1986). Security price reactions around product recall announcements. *Journal of Financial Research*, 2, 113–122.
- Pruitt, S. W., Reilly, R. J., & Hoffer, G. E. (1986). Security market anticipation of consumer preference shifts: The case of automotive recalls. *Quarterly Journal of Business Economics*, 25, 14–28.
- Rugman, A. M., & Verbeke, A. (1998a). Corporate strategy and international environmental policy. *Journal of International Business Studies*, 29(4), 819–834.
- Rugman, A. M., & Verbeke, A. (1998b). Corporate strategy and international environmental policy. *Journal of International Business Studies*, 2(4), 819–834.
- Salin, V., & Hooker, N. H. (2001). Stock market reaction to food recalls. *Review of Agricultural Economics*, 23(1), 33–46.
- Segerson, K. (1999). Mandatory versus voluntary approaches to food safety. *Agribusiness*, 15(1), 53–70.
- Segerson, K., & Miceli, T. J. (1998). Voluntary environmental agreements: Good or bad news for environmental protection? *Journal of Environmental Economics and Management*, 36(2), 109–130.
- Skees, J. R., Botts, A., & Zeuli, K. A. (2001). The potential for recall insurance to improve food safety. *International Food and Agribusiness Management Review*.
- Smyth, S., & Phillips, P. W. B. (2001). Competitors co-operating: Establishing a supply chain to manage genetically-modified canola. *International Food and Agribusiness Management Review*.
- Sparling, D., Lee, J., & Howard, W. (2001). *International Food and Agribusiness Management Review*. Murgos Farms Inc.: HACCP, ISO 9000 and ISO 14000.
- Sproull, L. S. (1981). Response to regulation: An organisational process framework. *Administration & Society*, 12(4), 447–470.
- Starbird, S. A. (2000). Designing food safety regulations: The effect of inspection policy and penalties for non-compliance on food processor behavior. *Journal of Agricultural and Resource Economics*, 25(2), 616–635.
- Thomsen, M. R., & McKenzie, A. M. (2001). Market incentives for safe food: An examination of shareholder losses from meat and poultry recalls. *American Journal of Agricultural Economics*, 82(3), 526–538.
- Walley, N., & Whitehead, B. (1994). It's not easy being green. *Harvard Business Review*, 72(3), 46–52.