

European Food Safety: Multilevel Governance, Re-Nationalization, or Centralization?

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Introduction

Many political scientists and economists agree that particularly in the European Union multilevel governance and subsidiarity are conducive to the effectiveness, efficiency, and democratic legitimacy of policy-making (e.g. Frey 2001). Multilevel governance refers to a form of governance in which policy responsibility is distributed among different levels of government and among the public and private sector. It involves a plurality of actors, for example, local, and national governments, international and supranational organizations, NGOs, trade associations, and firms. Subsidiarity means that decision-making takes place at the lowest possible and effective political and/or administrative level in a given political system.

In other words, multilevel governance and subsidiarity are said to effectively link political levels from local to supranational, the political system and civil society, and the public and the private sector. Decentralization in the form of subsidiarity is said to increase competition between national jurisdictions (EU member states), which, at its best, promotes economic and policy innovation as well as flexible policy adjustment to changing societal needs. As noted by Buonanno (2003) and other authors (Vos 2000, Kelemen 2000, Majone/Everson 2001), the EU has relied on multilevel governance and subsidiarity as an alternative to independent regulatory agencies used in other federal systems (e.g. the United States) to solve problems associated with the single market.

Focusing on food safety governance in Europe we challenge this optimism in regard to multilevel governance and subsidiarity. While fragmentation of public authority may be economically efficient in some areas, for example, some forms of taxation, some aspects of labor markets, or the provision of local public goods, it may, from a societal perspective, be less desirable in other areas. We argue that food safety is such an area. Public policies in this field aim at reducing risks that have individual, direct, tangible and short-term effects (Reinhardt 2000). The degree of public attention to food safety issues thus tends to be relatively high. Accordingly, public trust in the risk-minimization capacity of public and private institutions plays a greater role in food safety governance than in many other policy areas. We will show that this has important implications for the effectiveness of multilevel governance and subsidiarity in European food safety.

In studying the performance of multilevel governance and subsidiarity in European food safety policy we concentrate on what we see as the two most important dimensions: the national-supranational and the public-private dimension. We pay particular attention to market structures, and industrial self-regulation and compliance strategies. More specifically, the analysis centers on the following propositions.

Public demand in the EU for stricter food safety standards has grown substantially over the past ten years. In response to this demand, stricter standards have been set and implemented through a multilevel and subsidiarity-based governance system. This governance system bears the risk of a race to the top in EU food safety standards without significant positive effects on consumer trust. It also has coincided with increasing market concentration in food manufacturing and retailing. Driven

primarily by globalization and technological innovation, sectoral consolidation, in turn, has promoted industrial self-regulation and has put large firms in the driver's seat in EU food safety policy. However, the status quo in European food safety governance implies persisting uncertainty over whether firms can capture market benefits through proactive regulatory strategies and strict compliance or over-compliance with public standards. We illustrate market concentration processes with a focus on EU food manufacturing and retailing and self-regulatory and compliance strategies with Hazard Analysis and Critical Control Point (HACCP) systems. We submit that the EU and its member states face three policy options. They can either stick to their current approach, with implications as just noted. They can try, at considerable political costs, to move towards more centralized forms of governance in food safety. Or, EU member states can extend their scope of authority in food safety regulation (re-nationalization), which might lead to more regulatory competition and fragmentation of markets.

We start by briefly explaining why EU food safety standards have grown ever stricter in recent years. Empirical examples referred to include hormones in beef production and GM food. This section also shows that the EU's pre-existing institutional structure has translated the movement toward stricter food safety regulation into a governance system in which authority for risk-assessment and risk-management is fragmented and substantial policy responsibilities (and costs) are being shifted to the private sector. We then argue that stricter food safety standards in the EU have not resolved the underlying problem: consumer trust in the food supply remains rather low. The subsequent section connects the national-supranational and the public-private dimension of the EU's food safety governance system by focusing on the EU's policy options, notably in regard to multilevel governance and subsidiarity on the one hand and more centralized forms of governance (at the EU level) on the other hand. We use data on consumer perceptions in Europe, on market concentration in EU food manufacturing and retailing, and on HACCP to evaluate the plausibility of the propositions summarized above.

We end by discussing the pros and cons of centralized vs. multilevel governance in European food safety. We conclude that a regulatory agency model (centralization of risk-assessment and risk-management) may be less problematic than multilevel governance in terms of effects on markets. Centralization would contribute to a more stable regulatory and market environment, and it would foster firms' ability to appropriate market benefits by means of proactive regulatory strategies and strict compliance or over-compliance with public standards. Centralization may also increase transparency, accountability, and public participation. Finally, greater centralization in EU food safety policy would help in reducing externality problems in the EU food market by reducing problems of uneven *de facto* food safety standards among EU member states. For all those reasons, centralization may ultimately be more effective than multilevel governance in increasing consumer trust in the EU food supply and making the system less susceptible to crises.

Stricter Food Safety Regulation and Persistent Crisis

In explaining why EU food safety standards have grown stricter over time we focus on how EU member states whose constituencies are more risk averse can push the stringency of EU-wide regulation up. Because of the substantial degree of discretion of EU member countries in regulating food safety, risk perceptions of domestic constituencies can force the respective country to unilaterally install stricter product standards, which then sets in motion a policy process that usually results in stricter regulation EU-wide.¹

In integrated markets, and federal political systems such as the EU in particular, differences in product regulations between political subunits may impede the free movement of goods and bias competition. That is, jurisdictions with stricter standards may prohibit the import of products that do not meet their standards, while jurisdictions with laxer standards view these restrictions as protectionist non-tariff barriers to trade (Kelemen 2000:5; Vogel 1995, 1997). In some cases, conflicts over differential product standards can be solved through mutual recognition: each subunit grants access to goods lawfully produced in any other subunit within the same federal system. In other cases, regulations are harmonized at the federal level. Harmonization instead of mutual recognition occurs primarily when subunits with stricter regulation are unwilling to accept products (e.g. food) produced in countries with laxer regulation.

In principle, harmonization of product regulation can occur at any level of stringency, as long as the political subunits in a federal system can come to an agreement. We submit that the likelihood of harmonization at higher levels of stringency increases with the extent of policy-making autonomy of the subunits, the extent of opposition against downward harmonization in subunits with stricter regulation, and the extent of economic damage that would result from non-agreement [Author 2003]. This constellation of driving forces can be observed in many areas of EU food safety governance. EU regulations of hormones in beef production and food biotechnology are cases in point.

Growth Hormones in Beef

In 1985 the EU banned the use of growth-promoting hormones in beef production. Ever since, the respective regulations have been justified as reducing health risks posed by the banned practices. The EU's regulatory activity in this area started in 1980, when four of the then ten EU member countries (Italy, Netherlands, Denmark, Greece) unilaterally imposed bans on beef hormones in the absence of EU-wide legislation. Regulatory heterogeneity within the EU created conflict among member states. Some of the countries with more permissive hormone regulation claimed that stricter regulation in other countries had created non-tariff barriers to trade (Brand/Ellerton 1989:3.1). At the same time, sparked by scandals over illicit hormone sales, hormone use in livestock breeding developed into a

¹ This explanation combines several propositions from the political economy literature on regulation and federalism. For example Scharpf (1996, 1997), Vogel (1995), Oye and Maxwell (1996), Kelemen (2000, 2001), Hix (1999).

controversial public health issue. Ensuing consumer boycotts against hormone beef and veal resulted in a substantial drop of sales and prices of veal and beef in many EU countries.²

Driven by their constituencies' preferences for hormone free beef, media attention, and lobbying by import-competing beef producers, EU member states with stricter regulation refused to relax their standards. In view of partial national autonomy of other countries in regulating beef hormones and domestic political pressure, member states producing hormone beef thus feared competitive disadvantages and eventually a loss of their European beef export markets. The majority of EU countries therefore consented to the EU-wide hormone ban, only the United Kingdom refused to give in. Majority voting in the Council of Agriculture Ministers, however, enabled EU regulators to overcome the UK's opposition. Eager to avoid further market losses, food producers, processors and retailers in particular supported the Commission's view, favoring stricter rather than laxer and heterogeneous rules [Authors 2004].

Food Biotechnology

The emergence of modern agricultural biotechnology in the 1980s initially resulted in heterogeneous policy-responses by EU member states. Since 1990, however, approval, labeling, and tracing regulation in this area has become increasingly stringent and harmonized at the EU-level. The EU's agri-biotech policy has ever since been characterized by a dynamic process in which some EU countries introduce stricter standards and push other EU countries into a trading-up process that results in stricter EU-wide regulation.

Authority in EU agri-biotech regulation is divided between the Council, the European Commission, and the European Parliament (EP). Given the allocation of votes in the Council and the EP, there has been no clear majority either for stricter or for laxer agri-biotech standards. Partial national autonomy combined with varying domestic political pressure, preferences of the EU Commission, and the co-decision procedure (majority requirement in the Council and the European Parliament), account for why a "ratcheting-up" trend, rather than deadlock, has occurred. Particularly at times when EU decision-making bodies were deadlocked on the issue EU member states with more risk averse constituencies introduced or threatened to introduce stricter national rules, thus increasing regulatory heterogeneity. This heterogeneity has been amplified by standards that food processors and retailers have set on their own (e.g., labeling standards) to reduce market uncertainty pending EU regulation. Regulatory heterogeneity and its trade effects have then motivated the establishment of harmonized minimum standards at the EU level. Unilateral imposition of regulation (and industrial self-regulation) stricter than existing minimum standards has subsequently induced EU countries to raise the respective base standard closer to the strictest national standard. And so on.

² Der Spiegel 1982/3:76, 1985/46:153. On the history and the legal aspects of the European beef hormones case see Vogel (1995, 1997), Brand/Ellerton (1989).

The EU Food Safety Governance System

In addition to setting issue specific food safety standards, such as the ones just discussed, the EU has in recent years also institutionalized a more generic governance system for food safety. Its General Food Law, adopted in January 2002 (EC NO 178/2002), sets forth principles and requirements for all future food laws in Europe. The most noteworthy institutional innovation is the establishment of the European Food Safety Authority (EFSA).

The EFSA's core task is to provide scientific advice to the Commission and member state governments, and to create a network for close cooperation with similar bodies in EU countries. More uniform risk assessment is meant to avoid regulatory barriers in the single market, and to prevent failures in protecting consumers against food-borne risks. However, for the time being, authority remains divided between the EFSA, the EU's supranational institutions, and national governing bodies.

The EFSA and national authorities are responsible for scientific risk-assessment. Regulatory power is shared by various parts of the Commission, the European Parliament, the Council of Ministers, and national, regional and local governments or regulatory agencies. De jure, monitoring and enforcement of compliance with public standards are divided in complex ways between the Commission and (with variation across individual EU countries) and national, regional and local governing bodies. De facto, monitoring and enforcement of food safety are primarily in the hands of national food safety authorities and the private sector. The Commission merely monitors member states' performance more broadly. As illustrated by HACCP (see below), the private sector has increasingly taken over the primary responsibility for ascertaining that all stages of the food chain satisfy the requirements set by European food law (Vos 2000). In the next section, we focus on the performance of this system.

Persistent Crisis

The ratcheting-up of EU food safety standards in recent years has not resolved the underlying problem: consumer trust in the EU food supply remains quite low. We argue that the EU's multilevel governance system for food safety is at least in part to blame.

Concerns of European consumers about the quality and safety of their food supply and the methods of food production are well documented in many consumer surveys (see particularly Eurobarometer 49/1998). In a recent Eurobarometer survey (57/2002), for example, respondents were asked to select from a list of 13 tasks the one they considered most important for the Common Agricultural Policy (CAP). 89% of the respondents listed food safety, 84% animal welfare, and 83% the fight against fraud in the agricultural sector (Eurobarometer 57/2002:21). Surveys also show that most consumers in Europe trust consumer NGOs more than national governments or EU institutions when it comes to information on food safety risks (Eurobarometer 49/1998).

The root-causes of low consumer trust and the crisis-prone nature of EU food safety governance remain contested. Most authors (Löfstedt 2004, Vos 2000, Vogel 1995) trace low consumer trust in the safety of the EU food supply and low trust in public authorities back to food safety problems and associated NGO campaigns. Some also point to uneven *de facto* food safety standards across EU member states, which has created externality problems in Europe's food market. In contrast, we emphasize the role of governance and market structures.³ We submit that consumer trust in the food supply is highly dependent on policy and the institutional and market environment in which consumers find themselves.⁴ We discuss institutional and market conditions in turn.

European food safety governance has developed in an ad hoc fashion and has been guided by a system of committees and jurisprudence of the European Court of Justice (Vos 2000:227). Motivated primarily by common market considerations it has taken place in the absence of a coherent and well-defined framework for risk regulation and food safety policy-making at the supranational level. In addition, the EU's single market program has constrained the autonomy of national governments in food safety matters, but at the same time has coincided with deregulatory tendencies in many EU member states. The subsequent intermingling between the food industry, agricultural interests, and public health protection has raised consumer awareness and undermined public confidence in the capacity and trustworthiness of domestic and EU regulators.

Surveys indicate that already in the late 1980s – that is, before Europe hit the headlines in the 1990s for its food safety scandals – European consumers were skeptical about governments' take on food safety. A 1989 UK Consumer Association poll, for example, found that three quarters of a national sample did not trust the government on food safety matters (Consumer Association 1991). Subsequent food safety scares, such as Dioxin in Belgian chicken feed and the mad cow disease, have augmented public distrust in European food safety governance and have affected public risk perceptions more broadly. Most importantly, they have hampered the credibility of regulators (Majone and Everson 2001; Löfstedt and Vogel 2001) and have put strong pressure on the EU to expand its scope of influence in regulating food safety across Europe – notably also because the EU's food safety scares were in the first instance a result of failure of national and local governing bodies.

In other words, public distrust has become one of the primary factors influencing the EU's food safety policy-making. Indeed, the EU's institutional reform efforts in food safety governance

3 While we agree that other causes are important too we regard them as proximate causes. Behind them lies a more fundamental institutional and market structure problem that has made European consumers more sensitive to food safety issues. Political entrepreneurs (consumer organizations in particular) have capitalized on the public saliency of food safety matters and have effectively communicated to the public that the EU's food safety scares are an indication of a crisis in European food safety governance [Author 2004].

4 Durodié (2000), e.g., notes that European consumers' high demand for risk-reducing regulation stems from low trust in regulators and policy-makers rather than low trust in science and technology. See also James, Kemper and Pascal (1999).

have been characterized by strong emphasis on increasing consumer trust. This has motivated strict forms of precautionary-type legislation (Löfstedt 2004:24). As noted above, the latest building block in this effort is the 2002 Food Safety Law. This law is meant to signal to consumers that the EU is moving decisively toward a consistent, effective, transparent, and legitimate food safety policy.

As to market conditions, EU countries on average import approximately 50 percent of their total food supply from other EU countries or from outside the EU. Food import shares vary strongly across EU members. The UK, for example, imports almost 50 percent of its food supply, Italy 15 percent.⁵ Particularly compared to the United States, however, food import shares in the EU are high: in 2001, US food import shares were 11 percent for all food products and only 4.6 percent for animal products (Jerardo 2003:2).

Several analysts note that high levels of self-sufficiency in food production and distribution are likely to make consumers more confident in regard to the reliability and quality of supplies. The fact that around 90 percent of US food consumption is produced domestically may thus be an important factor in explaining why the US food market is more crisis resistant than EU markets when food safety problems arise (Author 2004). In this light, the slogan “Buy American” may be more than a simple marketing tool. The larger import share in the EU food supply, conversely, may help in explaining the greater risk-awareness of European consumers. In effect, we observe that when food safety problems (scandals) occur many consumers in the EU tend to switch to nationally or locally produced food supplies. In the case of BSE in Germany, for example, the share of local butcheries in fresh beef sales rose from 13 to 20 percent between March and May 1996 (Loy 1999). Opinion poll data shows that these changes in the supply structure occur because local butchers are being personally trusted for providing safe products of regional origin (Böcker/Hanf 2000).

In comparison to the United States the EU’s food market is also more fragmented. It is made up of national markets in which member countries and domestic producers have incentives to draw product distinctions between country or region of origin to capture market advantages. The US food market, in contrast, is largely one national market, and there is less incentive, at the state or local level, to differentiate food products via safety or geographical attributes.

The fragmentation of the European food market has important implications for consumer food safety awareness. After all, it provides producers with the opportunity to capitalize on public saliency of food safety matters in Europe. Whenever a food safety problem in one country arises, producers in other EU member countries have at least some incentive to enhance their competitiveness by signaling to consumers, through labeling or other strategies, that their products are safer than the products of suppliers from other countries. In contrast, US producers are less likely to benefit from blaming other producers. In the beef market, for example, such behavior would probably inflict damage on the beef industry as a whole. It would do little to improve the competitiveness of suppliers at the state or local level.

⁵ See <http://atn-riac.agr.ca/europe/e2935.pdf>.

In summary, we submit that multilevel governance in European food safety policy, combined with high food import shares and a fragmented food market, has led to a marketplace that is characterized by relatively intense regulatory competition. Competitive strategies are played out between EU member states in terms of protection of national markets by means of domestic food safety regulation as well as differential administrative practices and implementation of EU and domestic regulation. Competition also takes place among sectors within the food market and between firms within particular food sectors. Before turning to the effects of multilevel governance on food markets and corporate strategy, we focus on possible future courses in European food safety regulation and the fundamental policy options involved.

Policy Options

Two dimensions of the EU's multilevel governance system for food safety are particularly important: the national-supranational and the public-private dimension. These two dimensions are usually treated separately in the literature.⁶ We connect these two dimensions by focusing on the EU's possible future courses in regulating food-safety and the fundamental policy-options involved: that is, choices between *multilevel vs. more centralized forms of governance (at the supranational, EU level)* on the one hand and *private vs. public governance and implications for markets (business uncertainty and distribution of market benefits)* on the other hand.

To simplify the analytical task, we submit that this boils down to a choice between three modes of food safety governance. First, the EU and its member states can stick to the current policy approach. However, the status quo bears the risk of a race to the top in EU food safety standards without significant positive effects on consumer trust. It also implies persisting uncertainty over whether firms can capture market benefits through proactive regulatory strategies and strict compliance or over-compliance with public standards. Thus it may stifle innovative and proactive food safety strategies in the private sector. Second, the EU can try, at considerable political cost, to move towards more centralized forms of governance in food safety. Third, EU member states can extend their scope of (national) authority in food safety regulation. This approach, which amounts to re-nationalization of food safety governance, is likely to increase regulatory competition between states and fragmentation of markets.

We will revisit these policy options in the concluding section, arguing that the EU should opt for greater centralization in food safety policy. In the next section, we show that, driven by changes in market forces, market concentration in EU food processing and distribution has been growing. The subsequent section on Hazard Analysis and Critical Control Point (HACCP) systems in the food industry focuses on the implementation of public standards and corporate compliance strategies in this particular area. It suggests that ever-stricter regulation may, in principle, be contributing to market consolidation. Yet, given that EU member states continue to enjoy considerable leeway when

⁶ See Loader and Hobbs (1999) on the private-public dimension, and Buonanno (2003) on the national-supranational dimension.

it comes to administrative practices and implementation of standards, multilevel governance may, to some extent, also be weakening the effects of stricter regulation on market concentration.

Concentration in European Food Manufacturing and Retailing

The European food and drink industry, which buys and adds value to around 70% of all EU agricultural produce, is the largest manufacturing sector in the EU. Its production volume in 2001 was €620 billion, which amounted to 13% of total manufacturing and 13% of employment in manufacturing. France, Germany, Italy, the United Kingdom, and Spain accounted for 80% of production. The added value in 2001 was €145 billion.

The European food market is very mature, saturated (in terms of volume) and faces growing competition on export markets. Retailers hold a dominant position. These conditions have provided much room for consolidation and industrial concentration. In fact, analysts have in recent years noted a consolidation of market shares, increases in profit margins, wider geographic implantation of firms, and substantial mergers and acquisitions activity.⁷

Despite the economic weight of the food sector and rising concerns about market concentration, neither EU nor national authorities nor research institutions have systematically collected data on market concentration over a longer time-period. The sketchy data available thus far suggest, however, that the EU's food market is quite concentrated, and that concentration has increased significantly in recent years. It shows that average concentration ratios in food manufacturing increased substantially between 1987 and 2000 (the latest year for which such data is available). The trend towards multi-nationality is also strong. Moreover, also the food retail sector in the EU has experienced rapid concentration over the past decade. As noted by one source:

“ {in 1989} the top 10 of European retailing held a market share of less than 20%, only a few companies – Metro, Aldi and Carrefour – were operating internationally at that time...With the market share of the 10 largest multinational trading companies in Europe having more than doubled to 45 % between 1987 and today, it is forecast that over the next 10-15 years the level of concentration throughout the European market will rise to 70-75 % market share...The trend towards concentration also continues unabated on the industry side. 100 groups now account for more than 45 % of the sales in the total European market of approx. 882 billion Euros. The remaining 55 % is shared between 18,000 small and medium sized manufacturers. The Top 25 already have a market share in excess of 30 % and the trend is increasing.”⁸ As to food retailing the same source provides market concentration figures as shown in Figure 2.

7 See <http://www.ciaa.be/uk/documents/press/press28-11-03.htm>.

8 See <http://www.emd-ag.com/e/markt002.shtm>; <http://www.emd-ag.com/e/markt001.shtm>.

Figure 1: Market shares of Top 10 European Retailers (1998 market shares by volume in the food area)

	Market share in % (only food)
North Europe (Austria, Belgium, France, Germany, Great Britain, Ireland, The Netherlands, Switzerland)	32.0%
North America (Canada, USA)	22.4%
Scandinavia (Denmark, Finland, Norway, Sweden)	17.4%
Southern Europe (Greece, Italy, Portugal, Spain)	14.4%

Source: ACNielsen (<http://www.acnielsen.com/services/retail/>);
<http://www.emd-ag.com/e/markt002.shtm>

These concentration ratios are high for a sector that, particularly in Europe, is by nature geographically dispersed, fragmented, and subject to differing national and/or local regulation. More important, concentration has increased over time. The long run equilibrium may be one or two major firms per country, in larger EU countries perhaps three to five. This point has nearly been reached in Germany, France, the UK, Austria, the Benelux countries, Sweden, and Denmark. Concentration is still growing in Greece, Italy, Spain, Finland, Ireland, and Portugal.

Thus far, we have observed that growing stringency of food safety regulation in the EU, dominated by multilevel governance, has coincided with increasing market concentration in food processing and distribution. This raises two questions: first, does stricter regulation reinforce mechanisms of market consolidation; second, to what extent does multilevel governance enable these mechanisms to function, more specifically does it constrain or foster them? In addressing these questions the following section centers on Hazard Analysis and Critical Control Point (HACCP) Systems.

Hazard Analysis and Critical Control Point (HACCP) Systems

Many food processors and retailers in advanced industrialized countries have in recent years established corporate food safety systems at a cost of billions of Euros.⁹ They have done so in part voluntarily, in part as a result of government regulation prescribing such measures. Hazard Analysis and Critical Control Point (HACCP) systems have become the key element in most corporate food safety systems. HACCP is a process control technique based on total quality management principles. Firms use this procedure to identify and evaluate hazards that affect product safety, establish controls to prevent hazards, monitor performance of controls, and maintain records of such monitoring. The HACCP system is predicated on food producers having an adequate system of sanitary operating procedures. It can ascertain food safety only in conjunction with good manufacturing practices and good hygiene practices. HACCP focuses on measurable indicators and may thus offer a cheaper and more timely way of controlling food safety than standard product sampling and testing. This appears most important for food-borne microbial pathogens and chemicals because these occur rarely and testing costs are high.

In December 1995 EU Directive 93/43 mandating five of the seven principles of HACCP¹⁰ for parts of the food industry entered into force. In mid-2000 the European Commission followed up with a package of five measures to update and consolidate 17 existing hygiene directives. The introduction of HACCP in all areas of EU food production, with the exception of agriculture and retail trade, was the principal part of this package. It is likely to shift the regulator's task from direct safety inspection and enforcement more to oversight of proper operation by plants of their respective HACCP systems.

Most EU countries have in the meantime adopted at least some implementing measures for HACCP in meat plants, with substantial grace periods for smaller firms. However, EU plans to prescribe fully developed HACCP systems for all levels of the food supply chain are still pending as the Union is seeking to combine this process standard with product performance standards and systems of certification and traceability.

Surprisingly, research on the extent to which the EU's HACCP rules have been implemented, on when and why firms are exceeding government set standards, and on what the cost implications are for different parts of the food industry and different types of firms is still at an embryonic stage. For example, very few EU countries, with the partial exception of the UK, have carried out any

⁹ See Ollinger and Ballenger (2003).

¹⁰ HACCP involves seven principles. For a detailed description see <http://www.fsis.usda.gov/OA/background/keyhaccp.htm>.

systematic regulatory impact assessments of overall costs and costs for different types of food firms.¹¹

HACCP Implementation

To start with, it appears that implementation of HACCP varies strongly across countries, food industry sectors, and types of firms. A working paper by the British Food Standards Agency (FSA, 16 Nov. 2001), for example, notes that the introduction of HACCP will have minimal cost implications for food businesses and consumers and poses no problem for small businesses.¹² If this were true, one should expect high levels of implementation. Yet, in implementing HACCP regulation in meat plants in 2002 most governments in the EU, including the British government, granted generous grace periods for smaller plants. And because the UK's (and other EU countries') definition of small plants was wide, around 75% of food firms were granted such grace periods. At the very least, these grace periods indicate potential implementation problems with smaller food firms.

Moreover, those few surveys that have been carried out to date show that implementation of HACCP remains highly incomplete. An Irish survey in August 2001, for example, showed that 36% of food businesses did not have any food safety management in place, and that 52% had not heard of HACCP. Only 38% believed that they should be responsible for developing food safety management systems.¹³

A 2002 strategy paper by the British FSA (FSA paper 01/07/02) for achieving wider implementation of HACCP aims at implementing documented HACCP based controls in 30% of UK food businesses by April 2004. This target, which is said to compare favorably with other EU countries, suggests implementation of HACCP is a major problem. The FSA paper notes particular difficulties with smaller food businesses. In a 2000 FSA survey 48% of red meat slaughterhouses and 59% of poultry meat slaughterhouses in England, Wales and Scotland claimed to have full or partial HACCP systems in place. The corresponding percentage in Northern Ireland was 100%.¹⁴

11 The most advanced research on HACCP in the EU includes a cost-benefit analysis of HACCP for 12 firms in the UK, Italy, and the Netherlands. The small number of cases (12), however, does not permit any generalizations in respect to the questions raised in this paper. See J.W. van der Kamp et al., Presentations at EU workshop on Explaining Costs and Benefits of HACCP, Brussels, 26 January 2003.

12 www.foodstandards.gov.uk.

13 www.fsai.ir.

14 www.foodstandards.gov.uk.

Why Do Firms Implement HACCP?

Data on HACCP implementation is obviously scarce. But the evidence we have suggests that implementation varies across different parts of the food sector and across EU countries. Why do food firms implement or fail to implement HACCP? What role does firm size play in this context? Does HACCP promote industrial concentration by imposing higher implementation costs on smaller firms? We first outline several generic reasons for why firms may want to implement HACCP. We then focus on implementation costs and effects of firm size.

In many advanced economies, and particularly in Europe, the industrialization of food production, long supply chains that cross a myriad of national boundaries and regulatory systems, periodic occurrences of food safety problems, and other factors have led to a consumer trust deficit.¹⁵ Many food firms have sought to address this deficit by adopting business strategies that enhance trustworthiness and enable them to allocate blame and costs efficiently should one of their products turn out to be unsafe or experience declining consumer acceptance for other reasons.

Many firms have addressed trust deficits through branding, which involves a privatization of consumer trust. However, branding also involves a privatization of risk, particularly if firms move from individual brand products to turning the entire firm into a brand. In other words, branding shields food firms at least to some extent from food safety problems caused by other firms – in the best case, brand producers may even increase their market share as food safety problems with non-brand products grow. On the downside, firms experiencing safety problems with one of their own brand products cannot externalize the costs involved to the entire food market. And they cannot free-ride on positive externalities generated by a generally safe food supply in the respective market.

This is why food firms relying on brand products tend to be more interested in stricter corporate food safety systems than non-brand firms and are likely to be more willing to adopt strict HACCP and other food safety control measures. These systems allow firms to partition, allocate, control and reduce risks throughout the value chain. Surveys on the beef, poultry and dairy sectors in the United States support the proposition that brand-product food firms are the leaders in HACCP implementation and over-compliance with government-set standards.¹⁶ Unfortunately, no comparable surveys exist for Europe. However, it is hard to see why empirical findings for Europe should be different from those for the United States.

In the food market *perceived* safety problems are at least as important as real risks because food is a credence good – consumers are rarely able to reliably assess on their own the safety of food products. Firms may thus have an incentive to enhance their competitiveness in this market by signaling to consumers through branding and other competitive strategies that their products are safer than the products of other firms. As noted above, market and regulatory fragmentation in the EU's single market may in fact promote such behavior. However, there are also constraints on

15 Unnevehr and Jensen (1999).

16 Ollinger and Mueller (2003).

competition on food safety. Focusing on food safety as a competitive issue may backfire because it can make consumers more nervous about food safety. In addition, the firms involved may risk ending up in an expensive race to the top in food safety standards. Interestingly, the Global Food Safety Initiative¹⁷ and other private industry initiatives explicitly aim at limiting corporate competition on food safety issues. This indicates that at least some firms are competing on food safety standards and that such behavior is making parts of the industry nervous. Brand retailers also seem to worry that if they excessively drive up standards by competing on food safety they may lose market shares to food discounters – as long as governments are reluctant to follow up and impose higher standards on all firms in the sector.

As noted above, sectoral consolidation has in recent years resulted in a small number of large food processors and retailers, often with global business activity. Figure 3 shows the turnover and market shares of the 15 largest food trade groups in the Western and Central Europe.

Figure 2: The 15 largest food trade groups in Western and Central Europe

	Trade groups/ Total sales in million EURO	Turnover	Market share in %
1	EMD	95'393	10.7 %
2	Carrefour	58'709	6.6 %
3	Metro	49'856	5.6 %
4	EURO Group	47'342	5.3 %
5	Agenor	45'939	5.1 %
6	IRTS (Auchan-Casino)	44'585	5.0 %
7	NAF	40'615	4.5 %
8	Tesco	38'698	4.3 %
9	Aldi	30'007	3.4 %
10	Edeka	28'736	3.2 %
11	Leclerc	25'300	2.8 %
12	Sainsbury	23'224	2.6 %
13	Wal-Mart Europe	23'180	2.6 %
14	Tengelmann	14'957	1.7 %
15	Ahold	13'935	1.6 %
	TOTAL TOP 15	580'476	64.9 %

Source: <http://www.emd-ag.com>; <http://www.acnielsen.com>.

Firms of this nature need to cope with multiple jurisdictions involving a plethora of food safety standards. Thus they have strong incentives to seek private and/or public international food safety standards, such as HACCP, so that they can operate with the same standards in all plants and stores under their control. Several studies suggest that implementing HACCP may also produce economic efficiency gains for firms, notably, by reducing costs of raw materials inspections, raw materials inventory and other input costs.¹⁸

¹⁷ <http://www.globalfoodsafety.com/>.

¹⁸ Whether such gains are high enough to provide competitive advantages remains disputed in the relevant literature.

Finally, food processor and distributor firms may use higher food safety standards (including also over-compliance with government-set standards) to enhance their autonomy: adopting tougher standards may motivate governments to „leave firms alone“ and not to adopt and/or enforce stricter public standards – in other words, firms may buy political legitimacy and public good-will through stricter private standards. Stricter standards may also help firms in shielding themselves from vagaries associated with changing government regulation and variation in enforcement over time and jurisdictions.¹⁹

Firm Size and Economies of Scale

Firm size plays an important role in most of these generic explanations of variance in HACCP implementation. As indicated by substantial grace periods for smaller firms and survey results on obstacles to HACCP implementation smaller firms appear to be less willing and/or able to implement full-scale HACCP systems. The available information on the marginal costs of HACCP implementation and changes in industrial structure provides additional support for this proposition.

Large firms, particularly those in concentrated markets, tend to have much more influence on their suppliers than small firms. Thus they can impose quality standards quicker, more effectively and at lower cost throughout their supply chain. In other words, implementation of HACCP will be easier for large firms in concentrated markets. One indication for this is that implementation of HACCP has reportedly been more difficult in the seafood industry, which is less concentrated and more disaggregated, than for example in the red meat and poultry sectors. Studies on the US meat and poultry sector have also shown that only small plants may at times benefit from skimping on food safety efforts. Larger plants with poor quality controls have a higher probability of exiting the market.²⁰ In other words, large firms appear to have greater incentives and are better able to implement HACCP. Again, no comparable studies exist for the EU. But there are few reasons to assume that such studies would produce very different results than studies on the US meat and poultry sector.

Moreover, several authors observe that marginal HACCP implementation costs are lower for larger than for smaller firms. As noted by Unnevehr and Jensen (1998):

“The large investments and technical skills needed for implementation have economies of scale that favor larger firms...The fixed costs of adding control technologies and for HACCP training may be prohibitively large for small firms. Thus its mandate may pose a greater burden on small firms, and lead to further concentration in the processing industry...HACCP regulations may also create incentives for greater vertical coordination to control food safety throughout the production process...These incentives dovetail with other emerging forces favoring greater coordination, such

19 The extent to which proactive corporate strategies, particularly those relying on green marketing, can be successful in the longer term without backup from formal government regulation remains disputed.

20 Ollinger and Ballenger (2003).

as increased demand for uniformity of product or for specific quality characteristics to meet niche market demand...Thus HACCP regulations will reinforce these two structural trends for food industries in industrialized countries.”

A 1998 USDA study supports this assertion. It suggests that HACCP cost ratios for small/large US producers were 3:1 in the beef sector and 10:1 in pork production. In the same time period it observes growth in the number of large plants at the expense of small plants in both sectors, and large increases in margins. In the US poultry sector, where HACCP implementation cost ratios were approximately even, we observe less market concentration and a slower growth of margins.²¹

Again, no systematic studies on scale economies and effects of HACCP implementation on the structure of the EU food industry exist. However, the indirect evidence discussed here suggests that HACCP may, in principle, be promoting industrial concentration by providing larger food processor and distributor firms with a competitive advantage. Additional research will have to show whether larger firms might even be in a position to actively use HACCP as an instrument of regulatory competition.

In the United States large food producers pushed for mandatory HACCP standards and their phase-in in 1998, after having first supported their industry associations' resistance against mandatory public standards. Smaller businesses resisted the Pathogen Reduction/HACCP rule issued by the USDA's Food Safety and Inspection Service. With a view to HACCP implementation cost ratios and changes in plant numbers and margins (see above) one might argue that large firms have indeed been using stricter public HACCP standards as a strategy of gaining competitive advantage vis-à-vis smaller firms.²²

Effects of Multilevel Governance

The available evidence on HACCP suggests that stricter food safety standards may promote industrial concentration. But this evidence does not show whether and to what extent this effect is shaped by multilevel governance. This gap leaves room for two propositions: Multilevel governance may foster market consolidation, notably by providing cost advantages to large firms in complying with strict EU standards and heterogeneity in administrative practices and implementation. Conversely, fragmented authority in implementing HACCP and other food safety standards may soften or even neutralize the potentially positive effect of stricter regulation on industrial concentration. By implication, we do not know whether large firms are increasingly in the driver's seat in EU food safety governance because of or despite of multi-tiered governance.

21 Communication with James Foster and Kenneth Oye, MIT, Center for International Studies. See Ollinger and Mueller (2003); Hooker et al. (2002); <http://www.fao.org/DOCREP/003/x0465e/X0465E08.htm>. The USDA/ERS has been publishing contradictory assessments on whether HACCP implementation imposes a cost disadvantage on smaller businesses.

22 Communication with James Foster, Center for International Studies, MIT.

Unfortunately, currently available data do not allow for rigorous testing of these propositions. Confirmation of the first proposition would require empirical evidence that in time-periods when the EU's food safety governance system was more centralized market concentration was lower; or, that EU (or other) countries in which regulatory systems are more centralized experience lower market concentration.

As to the first proposition, however, one could argue that on the public-private dimension of multilevel governance HACCP has clearly been shifting responsibilities (and costs) to the private sector. On the national-supranational dimension HACCP is leaving much room for local, regional and national authorities in operationalizing, monitoring, and enforcing HACCP standards. Large food firms could, in principle, benefit from this trend.²³ Their total factor productivity is higher to start with. They operate largely out of EU countries that mandate stricter versions of HACCP – imposing those standards throughout their value chain, in whatever country they operate, enables them to comply with any particularistic local or national food safety regulation anywhere in the EU. And their marginal costs of implementing stricter food safety standards are smaller.

Not surprisingly then, the (limited) surveys of HACCP implementation that exist show that large firms have, on average, implemented HACCP quicker and more comprehensively than smaller firms. And they have exceeded minimum government-set standards more frequently than smaller firms. As exemplified by food safety governance reforms in France, Germany, and the UK (Rothstein 2003) national food safety systems in Europe are beginning to take account of these changes by formally providing more room for industrial self-regulation.

Conversely, there is some indirect evidence for the proposition that European food safety governance in its present form may adversely affect the potential of large firms to capture market benefits by means of proactive regulatory strategies or strict compliance with government-set standards. Accordingly, fragmentation of regulatory authority in the EU might weaken the positive effect of stricter regulation on industrial concentration.

Under the current EU food safety governance system, member states maintain a large number of non-transparent waivers and grace periods and provide highly uneven levels of support for smaller firms in implementing food safety controls. In some cases, compliance with national administrative practices may even involve non-compliance with the EU's HACCP standards. Formal or de facto cross-national heterogeneity of standards and administrative practices may in fact reflect national attempts to protect smaller and less efficient food firms from larger and more efficient businesses. And financial and technical support for smaller businesses at the local or national level may offset potential cost advantages of larger firms in implementing HACCP. Moreover, it is rather unlikely that firms engaging in strict compliance or over-compliance can obtain a competitive advantage by means of green marketing strategies alone. HACCP is clearly a case in point. In other words, it remains open whether proactive regulatory and compliance strategies of large firms can effectively translate into market advantages in the framework of EU multilevel governance in food safety. At

23 See also Bunte (2000).

the very least, uncertainty remains high over whether firms can ultimately capture market benefits by means of strict compliance or over-compliance strategies. This, in turn, bears the risk of stifling innovative and proactive private sector approaches to more stringent food safety standards.²⁴

Possible Impacts of Regulatory Centralization on Markets, Food Safety, and Consumer Trust

The EU and its member states will ultimately have to choose between three modes of food safety governance: the status quo, which is based on multilevel governance; more centralized (supranational) forms of food safety governance; and re-nationalization in this policy-area. In view of the disadvantages of multilevel governance and re-nationalization discussed above we now explore whether greater centralization could be helpful in terms of effects on markets, food safety, and consumer trust.

Some opponents of centralization in European food safety governance argue that centralization would accelerate the consolidation of food markets, to the extent that concentration ratios would become economically damaging. They claim that large firms operating from very competitive home markets and strict regulatory settings (mostly firms from richer EU countries, e.g. Germany) would overrun generally smaller firms from less competitive home markets and laxer regulatory settings (mostly from poorer EU countries, e.g. Greece) if all EU countries had to rigorously implement the same strict food safety rules. We contend that the effects of regulatory centralization on market concentration depend on the form of centralization. If properly designed centralized regulation would not necessarily increase market concentration.

Greater centralization in European food safety governance would simplify the regulatory environment. Thus it could also make the lives of smaller food firms easier, particularly if they are export-oriented – remember that the import share in most EU countries' food consumption is around 50%. More generally, further centralization in European food safety governance would provide a more stable regulatory and market environment that would benefit all types of food firms and sectors by reducing overall business uncertainty.

However, as noted above multilevel governance and heterogeneity of de facto standards might serve to protect smaller and less efficient food firms from larger and more efficient firms. Centralization, in contrast, might lead to somewhat stricter de facto standards in poorer EU countries where food firms are on average smaller and less productive. This might favor larger firms that have, voluntarily or because of stricter standards in their home market, already implemented stricter standards. Such competitive effects could be mitigated through uniform and transparent grace periods for smaller firms that would have to be phased out over time, and targeted technical and financial support.

In a food market where countries import an average of around 50% of their total food supply from abroad, such as in the EU, the potential for externality problems is very serious. As indicated

²⁴ This problem, per se, does not imply that multilevel governance slows down EU-wide expansion of large food firms.

by the EU's recurrent food safety problems, local deficiencies in food safety controls frequently reverberate throughout the EU. Centralization would result in more uniform risk-assessment and risk-management throughout the EU. But would it also lead to higher levels of food safety in terms of a reduction of food safety risks?

Opponents of centralization argue that supranational authorities in Europe have insufficient resources and political backing from EU member states to comprehensively set and effectively monitor and enforce compliance with EU-wide food safety standards. At present, this is clearly true. However, centralization would have to involve the shifting of resources to the supranational level so as to expand the EU's capacity for monitoring and enforcing compliance with food safety standards, at least at levels currently practiced by the US FDA. It would also have to involve a reorganization of regulatory authority that equips the EFSA with much more influence in regulatory standard setting, monitoring, and enforcement, perhaps in ways comparable to the European Central Bank vis-à-vis central banks in individual EU countries.²⁵

Opponents of centralization also claim that it would reduce transparency and increase the risk of regulatory capture. This argument is questionable. As noted above, it is rather the current system with its wide dispersion of authority across the public-private and local to supranational dimension that lacks transparency. In fact, studies on business regulation in Europe argue that the risk of capture, notably in terms of protection of national markets by means of domestic regulation, administrative practices and implementation, decreases when overall policy authority is moved from the local or national to the EU level.²⁶ Regulatory processes at the EU level are more open to competing interests (e.g. other firms from other EU countries, national and EU-wide trade associations, NGOs, the European Parliament, and so on). A statement by the Confederation of the Food and Drink Industries (CIAA) in the EU illustrates these points:

“CIAA believes that the only way to ensure that the requirements of consumer health protection are fulfilled throughout the entire food chain is by making all food businesses, regardless of their size, geographical location or point in the chain, comply with the same Community hygiene rules. CIAA agrees that the progressive implementation of the HACCP principles by all operators is the central part of the proposal... Exemptions should be established at the European level in a transparent manner, as part of a risk-based approach that offers the necessary flexibility to ensure that hygiene rules are proportionate to the risk involved.”²⁷

Finally, the arguments and empirical evidence discussed in this paper suggest that centralization may eventually be more conducive to consumer trust in the EU food supply. It would help in mitigating problems of informational overload of consumers. Under current conditions of regulatory and market fragmentation and competition, consumers find it very difficult to decipher

25 The FDA currently has around 9'000 employees, the EFSA is planned to have a staff of 250 and a budget of €40 million.

26 E.g. Hix (1999).

27 CIAA, Memorandum to the Italian Presidency of the EU, July 2003, www.ciaa.be.

the mass of product quality/safety claims by businesses who seek to differentiate their products on the basis of local or national origin, production methods, and other characteristics. It would also reduce the extent of competition between EU member states on food safety, which currently adds to the public saliency of and consumer concerns over food safety issues in Europe.

Conclusion

In contrast to the conventional wisdom among proponents of multilevel governance and subsidiarity we have argued that regulatory centralization in European food safety policy may perform better in several respects: in terms of avoiding business disincentives for adopting proactive and/or strict compliance strategies that would otherwise increase the competitiveness of innovative firms and would benefit consumers; in terms of increasing transparency, accountability, and public participation, diminishing local or national protectionism, and increasing consumer confidence in the European food supply; and in terms of reducing externality problems in the EU food market by minimizing problems of uneven de facto food safety standards among EU member states.

Major difficulties in establishing the European Food Safety Authority (see Buonanno 2003) indicate that centralization of food safety governance at the EU level is a long shot. The existing mode of governance reflects a delicate balance between inter-governmentalism and federalism in the EU. However, the current EU food safety governance system motivates strict forms of precautionary-type legislation, but has, so far, not substantially increased consumer trust. It also involves the risk of stifling proactive and innovative private sector approaches to food safety regulation. Hence it might adversely affect the competitiveness of the European food industry as well as food safety. The EU is in fact beginning to acknowledge the costs of its current approach to food safety governance. The 2000 Lisbon goal, for example, stresses the need for increasing the competitiveness of European industry by creating a clear, effective, and practical regulatory environment (European Commission 2001). The same holds for the 'Better Regulation Package' adopted in 2002. The latter emphasizes the use of regulatory impact assessments and stresses the need to improve the implementation of regulation.

We end with a caveat: the root causes of why many food safety problems in Europe develop into system-wide crises remain contested. As long as we do not have a clear understanding of these root causes it is difficult to determine whether centralization or multilevel governance would ultimately perform better. At the very least, we have tried to show that there should be no presumption that food safety is harder or costlier to achieve at the EU than at the individual member state and/or local level.

References

- Antle, J.M. (2001) *Economic Analysis of Food Safety*. Handbook of Agricultural Economics, vol. 1.
- Author (2000).
- Author (2003).
- Authors (2004).
- Böcker, Andreas and Claus-Hennig Hanf (2000) “Confidence Lost and – Partially – Regained: Consumer Response to Food Scares”. *Journal of Economic Behavior & Organization*, vol. 43: 471-485.
- Buonanno, Laurie (2003) *Politics versus Science: Apportioning Competency in the European Food Safety Authority and the European Commission*. Paper presented at the Second General Workshop on ‘European Food Safety Regulation: The Challenge of Multilevel Governance’, UC Berkeley, November 7-8.
- Brand, Amanda and Andre Ellerton (1989) *Report on Hormone Treated Meat*. Brussels: Club de Bruxelles.
- Bunte, F.H.J. (2000) “The Vertical Organization of Food Chains and Health and Safety Efforts”. Unnevehr, L.J. ed. *The Economics of HACCP*. Eagan Press.
- Author (2004).
- Cohen, R. (1980) “Boycott Shows EEC’s Consumer Power”. *The Globe and Mail*. October 16.
- Consumer’s Association (1991) 1989 Poll in: *Consumers and Food Policy*. London, Consumer’s Association.
- Durodić, Bill (2000) “Plastic Panics: European Risk Regulation in the Aftermath of BSE”. Morris, Julian. *Rethinking Risk and the Precautionary Principle*. Oxford: Butterworth-Heinemann: 140-166.
- Eurobarometer (1998) *Public Opinion in the European Union*. European Commission, DG X, No. 49, Brussels.
- Eurobarometer (2002) *Europeans and the Common Agricultural Policy*. European Commission, DG XI, No. 57, Brussels.
- European Commission (2001) *Communication from the Commission: Realizing the EU’s Potential: Consolidating and Extending the Lisbon Strategy*. Brussels, European Commission (COM 2001 79 Final).
- Frey Bruno S. (2001) *Liliput oder Leviathan? Der Staat in der Globalisierten Wirtschaft*. Zurich: Institute for Empirical Research in Economics, University of Zurich, Working Paper 85.
- Hix, Simon (1999) *The Political System of the European Union*. Basingstoke: Macmillan Press.

- Hooker, Neal H., Rodolfo M. Nayga Jr, and John W. Siebert (2002) "The Impact of HACCP on Costs and Product Exit". *Journal of Agricultural and Applied Economics* 34/1: 165-174.
- James, Philip, Kemper Fritz, and Gerard Pascal (1999) *A European Food and Public Health Authority: The Future of Scientific Advice in the EU*. European Union, DG Health and Consumer Protection, Brussels.
- Jerardo, Alberto (2003) *Import Share of U.S. Food Consumption Stable at 11 Percent*. Outlook Report No. (FAU7901), Economic Research Service, United States Department of Agriculture.
- Kelemen, R. Daniel. (2000) "Regulatory Federalism: EU Environmental Regulation in Comparative Perspective". *Journal of Public Policy*, 20/2: 133-67.
- Kelemen, R. Daniel. (2001) "The Limits of Judicial Power: Trade-Environmental Disputes in the GATT/WTO and the EU". *Comparative Political Studies*, 34/6: 622-50.
- Loader, Rupert and Jill E. Hobbs (1999) "Strategic Response to Food Safety Legislation". *Food Policy*, 24: 685-706.
- Löfstedt, Ragnar E. and David Vogel (2001) "The Changing Character of Regulation: A Comparison of Europe and the United States". *Risk Analysis*, vol. 21, no. 3: 399-405.
- Löfstedt, Ragnar E. (2004) *The Swing of the Regulatory Pendulum in the Europe: From Precautionary Principle to Regulatory Impact Analysis*. Working Paper 04-07, AEI Brookings Joint Center for Regulatory Studies.
- Loy, J.P. (1999) "Die Auswirkungen der BSE Krise auf die Verbraucherpreise für Rindfleisch in Deutschland". Berg E., W. Henrichsmeyer und G. Schiefer eds. *Agrarwirtschaft in der Informationsgesellschaft*. Schriften der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues, Bd. 35, Landwirtschaftsverlag Münster-Hiltrup: 249-256.
- Majone, G. and M. Everson (2001) "Institutional Reform: Independent Agencies, Oversight, Coordination, and Procedural Control". De Schutter, O., N. Lebessis and J. Petterson eds. *Governance in the European Union*. Luxemburg, Office for Official Publications of the European Communities.
- Ollinger, Michael, and Nicolve Ballenger (2003) *Weighing Incentives for Food Safety in Meat and Poultry*. USDA, April.
- Oye, Kenneth, and James Maxwell (1995) "Self-Interest and Environmental Management". Keohane, Robert, and Elinor Ostrom, eds. *Local Commons and Global Interdependence*. London: Sage: 191-222.
- Reinhardt, Forest L. (2000) *Down to Earth: Applying Business Principles to Environmental Management*. Harvard Business School Press, Boston, Massachusetts.

- Rothstein, Henry (2003) „Precautionary Bans or Sacrificial Lambs? Participative Regulation and the Reform of the UK Food Safety Regime.“ *CARR Discussion Paper Series*, Centre for the Analysis of Risk and Regulation, LSE DP15.
- Scharpf, Fritz W. (1996) “Politische Optionen im vollendeten Binnenmarkt”. Jachtenfuchs, Markus, and Beate Kohler-Koch, eds. *Europäische Integration*. Opladen: Leske & Budrich: 109-140.
- Scharpf, Fritz W. (1997) “Introduction: The Problem-Solving Capacity of Multi-Level Governance”. *Journal of European Public Policy*, 4/4: 520-38.
- Unnevehr, Laurian J. and Helen H. Jensen (1999) “The Economic Implications of Using HACCP as a Food Safety Regulatory Standard”. *Food Policy*, vol. 24: 625-635.
- Vogel, David (1995) *Trading Up: Consumer and Environmental Regulation in a Global Economy*. Cambridge, MA: Harvard University Press.
- Vogel, David (1997) *Barriers or Benefits: Regulation in Transatlantic Trade*. Washington: Brookings Institution.
- Vos, Ellen (2000) “EU Food Safety Regulation in the Aftermath of the BSE Crisis“. *Journal for Consumer Policy*, 23: 227-255.

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