

FOOD SAFETY POLICY: TRANSNATIONAL, HYBRID, WICKED

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Summary

According to the World Health Organization, there were an estimated 582 million cases of 22 different foodborne enteric diseases between 2010 and 2015. Over 40% of the people suffering from enteric diseases caused by contaminated food were children aged under 5 years of age. Highly industrialized livestock production processes bring with them antibiotic resistances that could soon result in an era in which common infections and minor injuries, which have been treatable for decades, can once again kill. Unsafe food also poses major economic risks. For example, Germany's 2011 E.coli outbreak reportedly caused US \$1.3 billion in losses for farmers and industries. Food safety policy ensures that at no point along the entire food chain—through production, storage, transportation, processing, and preparation—does food endanger human health. In an interdependent world of globalized trade and health risks, food safety is an extraordinarily complex policy issue situated at the intersection of trade, agricultural and health policy.

While traditionally considered a domestic issue, BSE and other major food safety crises that occurred before and around the turn of the century highlighted the need for transnational regulation and coordination to ensure food safety within regional and global single markets. As a result, food safety has received ample scholarly attention as a critical case of the transboundary regulation of what are often uncertain risks. The global architecture of food production also gives food safety policy an international and interactive character. Some countries or regions, like the European Union, act as standard-setters, whereas other, newly industrialized countries like China struggle to “do their homework”, and the poorest regions of the world strive for market access. Although national regulatory approaches differ considerably in terms of the degrees to which they rely on self-regulation by the market, overall, the sheer extent of the underlying policy problem makes it impossible to tackle food safety solely through public regulation. Therefore, private regulation and co-regulation play an influential role in the standard-setting, implementation and enforcement of food safety policy.

The entanglement of several interrelated policy sectors, the need for coordination and action at multiple – global, regional, national, local – levels, and the involvement of actors from the public and private, for-profit and non-profit fields, are the reasons why the governance of food safety policy is both characterized by considerable hybridity and why it requires both vertical and horizontal policy integration. Recently, scholarship has increasingly scrutinized how the resulting multiple and sometimes conflicting actor rationalities and the overlap of several regulatory roles affect the effectiveness and legitimacy of the decision-

making and implementation of food safety policy. By highlighting issues like regulatory capture and deficient enforcement systems, this research suggests another implication of the hybridization of food safety governance; namely, that food safety governance increasingly shares the characteristics of a wicked problem. Apart from the complexity and both high and notoriously uncertain risks, the multiple actors involved in food safety governance often diverge in how they define the problems and their strategic intentions. The major task ahead lies in designing recipes for integrated, context-sensitive and resilient policy responses.

Keywords: Food safety, hybridization, new modes of governance, regulation, wicked policy problems

Introduction

In a time of globalized food production and trade and what are often uncertain health risks, ensuring food safety is a complex regulatory challenge that touches a variety of sectors such as health, trade, agriculture, and the environment. One instance of this was the spread of Bovine spongiform encephalopathy (BSE) in cattle around the turn of the century. As a disease that can be transmitted to human beef consumers, this situation challenged food safety in the European single market. The crisis originated in the United Kingdom (UK) in the 1970s, when feed producers insufficiently sterilized meat-and-bone meal for cattle in order to save on energy costs. Even though the UK was quick in prohibiting the use of meat-and-bone meal for ruminants in 1988, compliance with the ban was insufficiently monitored and enforced and new cases were increasingly reported in the UK and in other countries. Though European governments reacted with a variety of measures, it was not until the European Union (EU) prohibited both the use of meat-and-bone meal and the export of beef from the UK that the disease was stopped from spreading. While these bans were lifted ten years later, since 2001 all EU member countries have been obliged to implement rigorous countermeasures and controls against BSE. It is estimated that by 2005, more than 150 people in the UK had died from the consumption of products contaminated with BSE. At the peak of

the crisis, 750,000 cows had to be killed per year because of the disease.

This article introduces the reader to different aspects of policies that seek to protect the public from such food safety risks, it describes recent developments, and outlines ways forward. The article mainly focuses on regulatory measures to reduce the risk of microbial contamination of human food (Doyle and Erickson 2008; Forsythe 2010). It does not directly address other food safety issues such as pesticide residues, Genetically Modified Organisms (GMOs), and bioterrorism (e.g., Alink et al. 2008; Deshpande 2002; Juneja and Sofos 2010; Nestle 2003). To answer the question of what food safety policy is (Stranks 2007), the article discusses the problems, processes, and stakeholders involved in food safety policy, recent challenges, and new governance structures in a globalized world, and in the European Union (EU) as an example of public food safety regulation. In response to several food crises, food safety policy around the globe has undergone major changes and advances. Public regulation such as that in the European Union (EU) has drawn on new regulatory structures, risk-based approaches, and the integration of food safety goals and measures into diverse policy sectors.

Currently, we are increasingly witnessing both border-crossing food safety regimes, comprised of networks of producers, and a general shift toward reliance on private, retail-driven regulation, where food corporations have the power to impose procedures and standards on primary food producers. These developments have fundamentally altered the existing power structures between public and private actors and have created new opportunities for, but also asymmetries between importing and exporting countries. One result is that there is competition between different regulatory spheres – for example, between public food safety laws and the requirements of private supermarket chains. The transnationalization of both public and private food safety regulation has also led to new modes of accountability: from at-the-border public control to the direct responsibility of suppliers for safe food, enforced through on-site inspections by retailers and third-party

certifiers.

The plurality of actors and regulatory approaches involved and the shared regulatory authority at global, regional, national, and local levels give food safety policy a high degree of hybridity. This hybridity has created challenges that give food safety policy the character of a wicked policy problem. Its wickedness stems specifically from, first, high degrees of complexity (e.g., coordinating UK, other national, EU authorities, and private feed and food producers to prevent BSE contamination); second, extraordinary uncertainty (e.g., with the causes and cures of new zoonotic diseases often unknown, see the avian flu); and inherently divergent perceptions and interests of the actors involved (e.g., producer versus consumer interests). However, there is also evidence of regulatory techniques that can improve the capacity of food safety governance structures to deal with multiple frames (“reflexivity”), adjust actions to uncertain changes (“resilience”), and respond to changing agendas and expectations (“responsiveness”). This article concludes that more research is needed to understand food safety regulation in practice (rather than on paper) and to identify the conditions under which transnational, private and hybrid regulation effectively protect food safety.

What is Food Safety Policy?

Food safety policy is defined as the goals, rules, and structures that are designed to ensure food quality and address the risk of food contamination in order to promote and protect the health of humans, animals and plants (Ansell and Vogel 2006; Cafaggi 2012; Redman 2007; van der Heijden et al. 1999). Food safety is widely recognized as crucial to effective health protection (Schmidt and Rodrick 2003; Uglund and Veggeland 2006). The Human Rights Council of the United Nations (UN) has recently devoted specific attention first, to the right to enough, and second, to the right to safe food (Cafaggi 2012). Yet, the World Health

Organization estimates that between 2010 and 2015, there were 582 million cases of 22 different foodborne enteric diseases (see Griffiths 2005). According to the United States Centers for Disease Control and Prevention (CDC), 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths result from foodborne diseases each year in the United States (US). Over 40 per cent of the people suffering from enteric diseases caused by contaminated food are children aged under 5 years of age. Food safety problems in developed and developing countries contribute to 1.5 billion cases of diarrhea in children and over three million premature deaths each year. In developing countries, approximately 1.8 million children die yearly of foodborne diseases caused by contaminated food and water (Fleckenstein et al. 2010; Lin 2014).

The globalization of economic activities, advancements in food science and transportation technology, the multinationalization of the food industry, and the advent of the World Trade Organization (WTO) have transformed the production, transportation, trade, and consumption of food. Population growth and distortions in commodity markets have contributed to the growth of industrial livestock production, where intense pressure for low-cost and efficient production prevails and antibiotics and synthetic growth hormones are commonly used (Davies 2011). Industrialized food production generally creates an increased availability of food, but with it come public health risks (Hayashi 2009), including a dangerous increase in the amount of antibiotic-resistant bacteria, environmental concerns such as waste, air pollution, water and soil contamination, energy inefficiencies, pesticide use, and the decline of biodiversity (Muller et al. 2009). Unsafe food also poses major economic risks (Richards et al. 2009; Scharff 2012): Germany's 2011 E.coli outbreak, for instance, reportedly caused US \$1.3 billion in losses for farmers and industries.

Processes and Stakeholders

To tackle these policy problems, food safety policies must govern the whole production and

supply chain for food, including its production, harvest, processing, storage, transportation, trade, retail sale and preparation both commercially and in private homes (Philipps and Wolfe 2001; Robson 2013).¹ These governance structures comprise a set of normative objectives and standards (standard-setting), processes for detecting deviations thereof (monitoring), and mechanisms for correcting non-compliant behavior (enforcement). They involve public or private regulators who are responsible for these functions, and regulated entities (regulatees) whose job it is to adopt the rules and comply with them (Verbruggen 2016). In an interdependent world of globalized trade and health risks, food safety is an extraordinarily complex policy issue situated at the intersection of various sectors such as health, agriculture, fisheries, industry, trade, and competition policy (Ugland and Veggeland 2006). Additionally, all steps of the human food supply chain leave an impact on the environment. Therefore, food safety policy includes diverse tasks such as preventing food-borne and microbial diseases (Labbé and Garcia 2001; Lund et al. 2000) as well as preventing the contamination of food from the use of pesticides on the farm, the use of commercial or industrial chemicals, and the use of hazardous waste (Hayashi 2009; Hiu 1994; Robson 2013).

Food safety policy involves and targets consumers, producers, and governments the world over (Havinga 2015). Agri-food policymaking has become less predominantly concentrated on the interests and needs of farmers over time (Daugberg and Feindt 2017; Mühlböck and Tosun 2017; Tosun 2017). Havinga (2006) distinguishes three important institutional actors: state (governmental agencies involved in rule-making, monitoring, or enforcement, states, and International Governmental organizations [IGOs]), the food industry and farmers, and third parties (private auditing and certification organizations, retailers, and consumer organizations). On the one hand, public food safety regulation is administered by state actors and developed through legislative processes and administrative decision-making.

¹ Food safety is not the same as the broader phenomenon of food security, meaning the ability to access sufficient amounts of safe and nutritious food (Fuchs and Kalfagianni 2010).

Food safety standards are monitored by (different) governmental organizations, such as regulatory agencies that can legally sanction non-compliant behaviour. The archetype of a public regulator is one that sets its own standards and has the legal power to monitor or enforce the compliance of regulatees (Verbruggen 2016). This classical public model would reserve rule-making to the legislature, monitoring compliance to an inspectorate, and enforcement to the criminal and administrative justice system.

On the other hand, in addition to public regulation, the food sector has a long history of quality control by manufacturers, trade associations, and corporatist organizations, particularly for perishable foods. Hence, systems of certification for producers, manufacturers, traders, controlling laboratories, and products are common. Private and semi-public organizations carry out controls and create rules and standards (Havinga 2006).

Challenges in a Globalized World

Around the turn of the millennium, a series of crises concerning human food and animal feed rendered food safety a major public concern (Ugland and Veggeland 2006). The BSE crisis was only one of them, but it illustrates that as globalized food supply chains amplify the seriousness, scale, frequency, and impact of food safety incidents, the latter have become extremely challenging to cope with (Jackson 2009; Lin 2014; Newell et al. 2010). From 1986 to 2008 about 190,000 bovine cases of BSE occurred in 21 countries, and more than 200 human cases were reported in 11 countries. Other food safety issues also gained salience, for example the contamination of animal feed from the use of dioxin alongside various risks from the use of pesticides, hormones and chemicals as animal food additives. In 2008, melamine-contaminated dairy products from China affected 46 countries, causing more than 50,000 cases of infant hospitalization and six reported deaths (Lin 2014). Such crises occurred alongside the globalization of food supply chains, the growing concentration of economic power among food retailers, and new concerns among consumers about animal welfare,

dietary habits, the environment, and fair trade. The crises exposed serious weaknesses in the established design and application of food legislation in many countries (Verbruggen 2016). Not only did these developments heighten consumer awareness and concerns over food safety, they also increased distrust of government oversight, and amplified associated reputational costs on branded food suppliers (Lin 2014).

As Lin (2014) outlines, the general perception of failing public regulation forced governments and the industry to review and reform existing mechanisms to regulate food safety. Many countries revamped food laws and restructured their regulatory systems by, for example, enhancing border inspection and implementing import restrictions and integrated food chain controls. For example, in China, the new Food Safety Law of 2009 replaced the old Food Hygiene Act. Still, numerous problems plague such national food law regimes as the existing public infrastructure as well as financial and technical capacities are often insufficient in ensuring food safety especially in developing countries. In other countries too, jurisdictional overlaps between different agencies can create inefficiencies in handling routine food safety surveillance tasks and in responding to crises of foodborne hazards. Other problems include ineffective law enforcement (see Thomann 2015b), a lack of cooperation between agencies and/or local and central levels of government, and fragmented regulations in different sectors relevant to food safety.

Such systemic limitations undermine the ability of public institutions to provide efficient and effective food safety governance. With globalized food production and consumption, national or regional regulatory failure such as in the case of BSE can cause food safety problems that spill over into other countries and have far-reaching economic, health and environmental implications. Unilateral national policies alone are simply insufficient to effectively cope with food safety problems in a highly interdependent world. Marks (2015: 937) notes that “today, supply chains are long and diffuse and most of the qualities that

consumers demand cannot be tested once the product has been placed on the grocery store shelf. (...) as consumers search for a range of attributes and assurances, governments struggle to ensure the safety of foods coming from a massive and growing food industry. Ultimately governments realize that they need additional resources to manage and certify the broad range of industries and certifications”.

New Governance Structures

All this has led to dramatic changes in the governance of food safety since the 1990s. First, national systems of food governance have been increasingly subject to transnational influence. The establishment of international regulatory bodies, such as the WTO or the EU, transferred regulatory power from domestic to international actors. Second, private governance has challenged, complemented or at times superseded public food governance. The increased influence of food safety standards set by private bodies illustrates the following: Nowadays, major retail and trade associations take leading roles in defining required product characteristics and process standards regarding how food is produced and how the process is managed. Third and related, the diversification of actors within the private sphere has brought about competition between the standards set by different private regulators (Cafaggi 2012; Verbruggen 2016).

The resulting changes in regulatory techniques concerned a broad range of both command-and-control and more risk-based strategies (Thomann 2017). Risk-based strategies are systematised decision-making frameworks and procedures that prioritise regulatory activities and deploy resources based on an assessment of the risks that regulated firms pose to the objectives of the regulator. For example, food safety inspectors could use data about food safety incidents in order to identify livestock farms that should be inspected more regularly than others. Modern food safety policies also range from public to private and they can range from requiring minimal intervention to requiring the imposition of highly prescriptive

obligations (Havinga 2006). There are both public (e.g., national food law) and private food safety standards (e.g., private certification schemes), as well as direct regulation where the government directly supports or limits certain activities (e.g., public regulation) and indirect regulation where third parties are responsible for delivering regulatory goals (e.g., product liability laws) (Buzby and Frenzen 1999; Havinga 2006). Examples of indirect regulation are the liability and due diligence provisions of the UK's Food Safety Act of 1990, later adopted by the EU, which make suppliers responsible for ensuring the safety of all food (Marks 2015).

Indeed, a general and important characteristic of new food safety policies is that they emphasise the primary responsibility of food producers for food safety. For example, Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP) serve to improve food production. Traceability schemes and food safety standards address food safety risks such as microbiological hazards (Fuchs and Kalfagianni 2010). Firms are required to work with a system of risk assessment based on the principles of the Hazard Analysis Critical Control Points (HACCP) - a typical case of “enforced self-regulation” (Antle 1999; Wallace et al. 2010). Under enforced self-regulation, the regulator compels the regulatee to write a set of rules, while the regulatee internalizes the costs and duties associated with rule enforcement (Thomann 2017). The HACCP standard requires that all food businesses along the supply chain except primary producers set up self-assessment systems that are tailored to their business processes so they can identify the (potential) hazards in their individual operations, implement and monitor controls, and document this process (Verbruggen 2016).

Public Regulation: The Example of the EU

The European Union (EU) has undertaken comprehensive reforms in its approach to food safety (Ugland and Veggeland 2006: 612 ff). In response to several food crises, the EU issued regulation 178/2001/EC, which currently provides the general legal framework for food safety regulation in the EU (for detailed descriptions, see MacMaoláin 2015; van der Meulen 2014;

Ugland and Veggeland 2006). Secondary EU legislation details the obligations of member states and their authorities to implement and control food safety directives (Thomann 2015a). The European Food Safety Authority (EFSA) was created to provide EU institutions and member states with scientific and technical opinions on food policies and the resolution of food safety incidents (Abels et al. 2016; Verbruggen 2016) and thus plays a key role in EU food governance (Fuchs and Kalfagianni 2010: 19). The Health and Food Audits and Analysis Directorate, which exists under the European Commission's Directorate General for Health and Food Safety (DG SANTE) carries out inspections in member states in order to ensure that effective official control systems are in place and also evaluates compliance of member states with EU food safety legislation. DG SANTE drafts and proposes EU laws on product and food safety. The European Forum of Food Law Enforcement Practitioners (FLEP), founded in 1990, provides an informal network for national food law enforcement practitioners to exchange information, foster learning and cross-border co-operation, and develop mutual trust in the resolution of practical control problems.

In the member states, national ministries and departments and food safety agencies set and administer food safety rules. The national food safety agencies are either independent regulatory agencies or the executive service of a ministry (Abels and Kobusch 2015; Verbruggen 2016). They interact with one another either formally through EFSA or informally through FLEP (Abels et al. 2016). The enforcement of food safety laws is done by agencies or ministries, and sometimes by local enforcement officers at the state, city, or community level (Verbruggen 2016). Member states differ notably in how they implement, enforce and complement EU food safety requirements, resulting in "customized" domestic solutions. In terms of putting EU law into practice, member states also place different emphasis on indirect and private regulation (Thomann 2015a). Hence, the EU example illustrates how international coordination co-exists with local diversity in food safety policy. Despite this diversity, however, it is clear that the scope of food safety regulation no longer

stops at national borders.

Transnational Food Safety Regulation

Economic globalization has made national boundaries permeable and therefore open to the flow of goods, services, humans, investment, information and of course, food. As the global sourcing of food ingredients has become feasible, global food supply chains have emerged. Yet the highly industrialized and globalized patterns of food production and consumption within regional and global single markets have rendered food safety problems an issue beyond the scope of traditional state-centric regulation. Because contaminated food outbreaks do not respect national boundaries, unilateral measures adopted by national governments cannot effectively address the problem of global food safety (Lin 2014). This makes food safety a critical case for the transnational regulation of what are often uncertain risks (Barlow and Schlatter 2010). With food safety becoming a global regulatory issue, various forms of public, private, and hybrid global food safety regulations have emerged in a multilevel system in which different co-regulatory modes operate (Cafaggi 2012; Kobusch 2015). In these co-regulatory modes, the regulator and the regulatee share the responsibility for the design and the enforcement of food safety regulation (Thomann 2017).

Transnational Public Food Safety Regulation

On the public side, there exists a well-established body of regulations by International Organizations (IOs) such as the EU, the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO) and the Codex Commission, a global standard-setting organization responsible for setting thousands of standards and guidelines to protect health and ensure fair trade practices (Cafaggi 2012; Figuié 2014; Millstone and van Zwanenberg 2002; Skogstad 2001). The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) is the only and the main multilateral treaty that

regulates trade and thereby indirectly monitors and regulates food safety (Stanton 2012).

Under the “SPS-default” standard, countries adopt the standards set by the WTO, the Codex Alimentarius Food Safety Standards (“Codex standards”), which run parallel to the WTO Agreement. Created in 1963 by the FAO and WHO, the Codex Alimentarius contains purely voluntary numerical standards (food safety limits such as maximum residue limits on pesticides and veterinary drugs, maximum levels for contaminants and food additives) as well as process standards (e.g., hygienic practices in the management of food production operations and procedures for establishing compliance with these operations). Its 159 members cover 99 per cent of the world's population, and it promulgates 336 standards and guidelines that are used to resolve trade disputes and to draft national legislation. Some countries adopt higher (“SPS-plus”) food safety standards as part of their bilateral or regional agreements. These higher food safety standards include more detailed or demanding provisions than the SPS Agreement requires, or that contain other regulatory or cooperative elements (Marks 2015).

It has been noted that these public institutions, despite their international scope, have difficulties in efficiently and effectively addressing the policy problems surrounding global food safety issues. For example, the SPS agreement does not require governments to take positive steps to ensure food safety, but mainly seeks to create exceptions and to facilitate food trade. Also, the scientific basis of the Codex standards, the legitimacy of its substantive and procedural rules, the accountability of its structure and operations, and the transparency of its decision-making process have been challenged. Indeed, Codex holds legal status as a quasi-legislator whose standards are de facto mandatory for WTO members. In contentious food safety issues, in particular, the backing of WTO dispute settlement system incentivizes Codex member states to use the Codex platform as a means to pursue their trade interests instead of food safety. When it comes to politicized, controversial disputes over issues like beef growth hormones (BGH) and GMOs, the Codex is problematic due to the frequent use of majority

vote, poor developing-country participation, and potential conflicts of interest over scientific authority. Symptomatic of these problems is that the WHO, the United Nation's special agency mandated with managing global health issues, has refrained from adopting any binding legal instruments on food safety for over 65 years (Lin 2014).

Transnational Private Food Safety Regulation

Given these drawbacks, a transnational system of private regulation has emerged which complements the international public regulation of the food sector, is strongly retail-driven, and cuts across commodities. Agrifood and retail food corporations are powerful and increasingly legitimate political actors in global private food governance (Fuchs and Kalfagiani 2010). In this system, rules are made at the transnational level by combining international soft law, private codes and guidelines. The transnational system of private regulation has entailed a shift from product to process standards, which no longer directly target the product and its quality, but rather the process of producing the product. By including all the nodes in the production process, this shift has increased the need for a supply chain approach. This approach includes private initiatives mainly designed through inner supply contracting, promoted by multi-national retailers, and involving the whole chain up to the farmers (Cafaggi 2012).

In this vein, a minority of countries – for example, the United States, Canada, the Netherlands, and the United Kingdom –are adopting a new level of standard (“SPS-plus plus”) to achieve higher standards by means of third-party certification and other private practices found in supply chains, supermarket programs, grocery standards, and voluntary codes and guidelines (Marks 2015). Additionally, as Cafaggi (2012: 7) highlights, “today, contracts for exchanges within the food supply chain (...) are meant not only to complement State and international public regulation, but also to ensure the enforceability of (...) international soft law, the Codex Alimentarius provisions and transnational private

regulation”.

A telling example of transnational private food safety regulation is the Global Food Safety Initiative (GFSI). The GFSI was formed in 2000 by food industry leaders as an international food safety and traceability benchmarking effort to provide suppliers with global food safety certification. The GFSI seeks to strengthen consumer confidence in the food bought in retail outlets. It provides a simple set of standards, harmonized between countries, and saves money for suppliers (Havinga 2006). The GFSI recognizes private food safety schemes such as GlobalGAP, BRC, SQF1000, SQF2000, and PrimusGFS.1 (see below) by assessing the food safety standards of each scheme and the governance and management structure of the owners. Suppliers certified by a GFSI-recognized scheme know that it conforms to a global scheme standard and meets internationally recognized minimum food safety requirements developed by multiple stakeholders. In recent years, food processors, retailers, and foodservice entities have increasingly turned to GFSI standards (Havinga 2006). Wal-Mart, for instance, requires that suppliers comply with GFSI-benchmarked schemes, which has led to some success: Two years after adopting the GFSI standards, there was a 34 per cent reduction in the number of recalls the company made across the same supplier base (Marks 2015).

New Modes of Accountability

The trend toward transnational food safety regulation, and especially its private forms, has affected how accountability is exercised (May 2007). Power has shifted from the national to the transnational and from public to private sphere. Multinational liability often requires that due diligence requirements extend beyond corporations into contractual relationships with suppliers along the chain. The move from at-the-border public control to the direct responsibility of suppliers for on-site inspections by retailers and third-party certifiers means that control over compliance is ever more in the hands of the supply chain management and firms in importing countries. Retail-driven regulation has burdened producers, mainly located

in exporting countries, with higher costs for safety monitoring procedures. Civil liability regimes remain more centered around the supplier or the importer. For instance, in the UK the legal system for food safety control, Food Business Operators (FBO), is held responsible for producing food that causes food poisoning even if the FBO does not cause the poisoning.

Private monitoring in international regulatory contracts often includes third-party rather than first-party monitoring. This means that it strongly relies on the intervention of third parties: certifiers, but sometimes also NGOs and the media. Particularly with respect to moral and social issues related to food safety, such as animal welfare, environment, labour conditions and ethical trading, sanctioning system are increasingly directed at deterring, blaming and shaming infringers rather than compensating consumers for losses suffered. In such settings, civil society and other market actors play a significant role in ensuring proper monitoring and nonjudicial enforcement, for example, through reputational mechanisms (e.g., websites) (Cafaggi 2012). In Germany, for example, consumer-oriented NGOs have used media channels to uncover supposed “organic” egg producers who had not complied with the welfare and hygiene standards.

This notwithstanding, conventional consumer protection mechanisms remain in place, such as adjudication by national courts, administrative regulation, criminal liability, product liability and sales law provisions for unsafe products. The co-existence of public and private, transnational and domestic regulation affects both the design and the enforcement of contracts and ultimately, the shape of the food chain itself. Domestic contract laws fill gaps where regulatory contracts do not explicitly regulate food safety matters, and many other fragments of domestic legislation also affect international regulatory contracts (Cafaggi 2012). Overall, however, Cafaggi (2012) argues that the consolidation of transnational, retail-focused private regulation calls for closer coordination and a new conceptual framework: The unit of regulatory analysis should become the supply chain rather than the single multi-national firm.

As a consequence, new regulatory instruments should capitalize on multi-party contractual networks (horizontal among farmers or vertical between farmers, processing food firms, and retailers).

Asymmetries Between Importing and Exporting Countries

The global architecture of food production also gives food safety policy an interactive character. In this global order, some countries or regions, like the EU, act as standard-setters, whereas other, newly industrialized countries like China struggle to “do their homework” (Li et al. 2010) and the poorest regions of the world have no choice but to comply (Otsuki et al. 2001; Unnevehr and Hirschhorn 2000).

In developing countries, one food retailer is often the sole purchaser of a given type of product. For example, in Guatemala, the Chiquita Brand (United Fruit) has historically maintained a monopoly. Market control grants these retailers the power to govern. They are able to impose demands on producers and producing countries that are hard to avoid.

Compliance with these demands is certified through independent auditors and controlled through yearly auditing. If suppliers do not comply with the standards, they are ultimately excluded from the supply chain or the export market (Fuchs and Kalfagianni 2010: 14; see Tosun and de Moraes 2016 for a case study of Brazil). Along global food supply chains, when there is an economic power asymmetry between the procurer and supplier, transnational private food safety standards are effectively binding requirements (Lin 2014). Many suppliers and exporters in developing countries are generally unaware of the public or private nature, source, or process of “law” in an importing country. All they know is that to sell their product in a developed country market, they are required to comply with certain rules and standards.

On the one hand, this has the potential to create competing public and private regulatory spheres at the transnational level, a crucially important phenomenon which is still under-researched. Cafaggi (2012) points out that suppliers in developing economies must meet many

different standards to be able to access distribution systems in multiple regions. Often, large retailers develop their own regimes to exercise competitive pressure over rivals. This fragmentation of standards makes it extremely hard for producers to comply with common principles in order to manage risks such as preventing outbreaks and pandemics. It can improve the quality of products, but it also creates transaction costs in producing countries, which in turn create barriers to market access. The costs of compliance and certification present a hurdle for developing export-oriented schemes especially for small producers in developing countries (Stanton 2012).

On the other hand, Henson and Jaffee (2008) point out that given the typically weak food safety and quality management capacities in developing countries, research has focused more on the potential impact of food safety standards acting as a “barrier” for developing countries to access high-value food product markets. However, in an ever-changing and increasingly complex standards environment, producing countries have developed strategic responses to food safety standards. These responses vary among countries and exporters, their perspectives on and capacity to deal with emerging requirements. “Reactive” responses by governments reflect a culture of “stonewalling” until threats become “real”, which then requires what is often a lacking capacity to swiftly implement the changes necessary to achieve compliance.

Conversely, some leading exporting firms that have had the foresight and necessary resources and have seen a potential “first-mover” advantage have also developed more proactive responses. For these larger, more diversified firms, emerging standards can be “catalysts” for upgrading their capacity and competitive repositioning. The Indian fishing industry’s response to EU food safety requirements illustrates this. Due to the problem of hygiene standards of exports, many Indian processors have spread their risks by diversifying their market base between the EU, the US and Japan, and have increased sales to ‘less challenging’ markets such as those of China, the Middle East and Singapore. Hence, while transnational standards

do pose a threat of market exit for smaller firms, they may create positive gains for larger firms. These responses can provide lessons for the direction of technical assistance and support programmes to guide the responses of developing country exporters more generally (Henson and Jaffee 2008).

In summary, the impact of using transnational standards in developing countries is complex and evolving, and their impact both negative and positive (for comprehensive discussions, see Henson and Humphrey 2010; Maertens and Swinnen 2012; Stanton 2012). Key to understanding the local welfare implications of increasingly high-standards food trade is the way in which supply chain structures and governance systems respond to these developments. There is also robust evidence for positive employment effects, productivity and welfare gains, increased household incomes, reduced volatility of household income and poverty, and technology spillovers especially for smallholders in developing countries. A comprehensive assessment of these effects is difficult because often the data for precisely identifying these effects is lacking (Maertens and Swinnen 2012).

Hybridity in Food Safety Regulation

We have seen that overall, the sheer extent of the underlying policy problem makes it impossible to tackle food safety solely through public regulation. Accordingly, the growing influence of the private sector in food safety means that the focus on the state for providing food safety is no longer accurate (Marks 2015: 929). Although national regulatory approaches differ considerably in the degrees to which they rely on market self-regulation, private regulation and co-regulation play an influential role for the standard-setting, implementation and enforcement of food safety policy (Martinez et al. 2007). The entanglement of several interrelated policy sectors, the need for coordination and action at multiple levels – global, regional, national, and local – and the involvement of actors from the public and private, for-

profit and non-profit fields, are the reasons why the governance of food safety policy is a paradigmatic case of hybrid regulation.

Private Food Safety Governance

All the developments described above, together with changing consumer attitudes, the need for commodity-specific regulations and the adoption of an integrated food chain approach, led to the emergence of private modes of food safety governance involving supply chains and trade associations (Holleran et al 1999). Traditional public command-and-control regulation has been increasingly replaced by more flexible, complementary market-oriented mechanisms. Examples include codes of conduct enacted by trade associations at national and global levels, supply chain agreements, and framework contracts. Retailers such as Carrefour, Tesco and Wal-Mart have emphasized their responsibility to ensure food safety in their Corporate Social Responsibility (CSR) reports, established the HACCP, and traceability systems (Lin 2014; Unnevehr and Jensen 1999; Verbruggen 2016).

There are two main types of private food safety standards: legally-mandated private standards and voluntary private standards. The former are developed by the private sector and then made mandatory by public bodies; examples include some ISO or fair trade standards. The latter are developed and adopted by private bodies – for example, Tesco's Nature's Choice/Nurture and Carrefour's Filières Qualité (Henson and Humphrey 2010). In this latter vein, purely non- state or voluntary, market-based regimes are driven by private actors such as firms, associations, or NGOs, and are free from active state involvement (Verbruggen 2016). Multinational food companies, supermarket chains and non-governmental organizations (NGOs) employ private standards, certification protocols, third-party auditing, and transnational contracting practices.

The motivation for private actors to develop such standards include reputational cost concerns (such as in the aftermath of the BSE crisis), which led private actors along food supply chains

to engage in games of product differentiation and marketing strategies (Lin 2014; Loader and Hobbs 1999). Globalization has created a demand amongst multinational food companies and retailers for contracts that could increase efficiency and coordination, streamline their operations, reduce transaction costs, and harmonize their standards, while also offering food with attributes other than food safety (environmental, social, and animal welfare dimensions). This also means that new private standard setters – most importantly, large Western retailer groups – are emerging, moving away from traditional coalitions of trade associations. Especially given the advent of food safety crises, such private governance systems encourage enterprises belonging to the chain to avoid shirking, and also help them maximize collaboration by effectively sharing risks among the enterprises belonging to the chain (Cafaggi 2012).

Private food safety governance may comprise the creation of industry codes of conduct that are monitored by peers and enforced through reputational (market) sanctions (Verbruggen 2016). An example is the food safety requirements that Dutch supermarkets impose on their suppliers (Havinga 2006: 528): “Several respondents and documents from supermarket organizations stress that food safety is a non-competitive issue. Their message is: all food in each supermarket (in The Netherlands) is safe”. Accordingly, what Cafaggi (2012) calls “contractual governance” is often promoted by retailers and drafted together with producers. Audit services (auditors, certifiers, consultants) is another important actor category. They monitor how the private standards adopted under transnational certification schemes are implemented at the national and local level (Lytton and McAllister 2014). Finally, individual companies in the food industry may design firm-specific systems of food safety control (HACCP systems) that can in turn be enforced by national food safety agencies (Verbruggen 2016).

Private Food Safety Schemes

A highly institutionalized form of private food safety regulations are what are called private food safety schemes that include a set of standards plus a governance structure for certification and enforcement with these features including accreditation, certification, standard setting, adoption, implementation, conformity assessment, and enforcement (Marks 2015: 930). Prominent food schemes include the Global Good Agricultural Practices (GlobalGAP; the most widely implemented transnational food safety standard for agri-food in the world), the British Retail Consortium (BRC) Global Standards, International Featured Standards (IFS), Safe Quality Food (SQF) and Tesco's Nature's Choice (Fuchs and Kalfagianni 2010: 8-9). Some transnational schemes such as GlobalGap also have national spin-offs or accept national standards as equivalent. Such national standards include ChiliGAP, ChinaGAP and KenyaGAP, the “Red Tractor Farm Assurance” scheme in the UK, the Qualität und Sicherheit (Quality and Safety) scheme in Germany, and the Dutch IKB Varken (IKB Pigs) scheme. Major retailers govern the schemes (e.g., Ahold/Delhaize, Carrefour, Tesco, Wal-Mart), together with multi-national brand-name manufacturers (e.g., Kraft, Nestlé, Unilever), and/or global audit service providers (e.g., Bureau Veritas, Lloyds, SGS). In addition, national assurance schemes are administered by national trade associations or audit service providers such as the American Institute of Baking (AIB) in the US and RiskPlaza in the Netherlands (Verbruggen 2016).

Changed Power Structures

In the US, the five largest supermarket chains almost doubled their market share between 1997 and 2005, and in the EU, the top five retailers control more than 70 percent of the grocery retail market. In individual countries, the concentration is even higher. In Latin America, the top five chains per country control 65 percent of the supermarket sector. High retail concentration implies a high degree of economic power. In addition to the ability to dictate prices, their oligopolistic or even monopolistic position allows retailers to impose their

own standards on suppliers (Fuchs and Kalfagianni 2010). As more and more consumers are shopping in retail stores and expressing demand for certain product attributes, a large portion of buyers in global agri-food markets now require that their suppliers meet private requirements. In Europe, for example, over 85% of all Western European retailers require GlobalGAP certification (Marks 2015; Lin 2014). Quality and safety directors of major food retailers in OECD countries estimate that between 75 and 99 per cent of all food products supplied are certified on the basis of the private food standards part of the schemes (Fulponi 2006; Verbruggen 2016).

Although private standards are, in theory, not mandatory for suppliers, given the enormous market and economic power of multinational food companies, many have a de facto mandatory status (Lin 2014). In fact, whereas public regulation has moved from detailed input to broad output standards, private regulation often entails detailed prescriptions leaving little or no discretion to suppliers. This way, large food producers and retailers gain full technological control over the manufacturing process (Cafaggi 2012). As Cafaggi (2012) highlights, private contractual food safety arrangements differ in how they re-allocate regulatory power between farmers, producers and retailers. He argues that the structure of the market, the value created in the supply chain, and the chain's degree of integration affect the choice of private instruments regulating food safety.

The GFSI was established to ensure more coordination among these schemes and reduce costs of multiple (and partly overlapping) audits for food business operators. It assumes a meta-regulatory role: the benchmarking against the GFSI guidelines has resulted in a growing convergence of and coordination between the major private food safety schemes. The GFSI also provides a global platform for the promotion of the 'GFSI system' and the exchange of information on the safeguarding of food safety. It also contributes to the continuous improvement of private food safety schemes since it forces actors to discuss and include

requirements related to, for example, auditor integrity and training, the prevention of food fraud, and the prevailing food safety cultures in firms. Still, retailers and brand-name companies continue to impose their own food safety assurance systems, mainly through CSR strategies (Verbruggen 2016).

Hybrid Food Safety Governance

In practice, however, food safety regulation is rarely purely “public” or “private”; rather, it is almost inevitably the outcome of a process involving different sites of regulation and different kinds of actors that interact with one another in relation to one or more regulatory functions (Verbruggen 2016). Transnational and national governments, the food industry and retailers are currently exploring new ways of regulating food safety regulation by involving both public and private organizations (second- and third-party actors, such as firms, associations, and NGOs) active in rule-making, monitoring compliance, and enforcement (Havinga 2006). For example, US regulatory agencies let industry and NGOs participate in decision-making, by means of notice and comment, public consultation and negotiated rule-making, in order to strengthen scientific and technical expertise. Similarly, robust and effective regimes of private self-regulation often use the threat of government action (Verbruggen 2016). For example, the UK’s Responsible Use of Medicines in Agriculture (RUMA) Alliance has issued comprehensive and transparent guidelines for the responsible use of antimicrobials in livestock production. Livestock farmers comply with these guidelines not least in order to avoid violating EU standards for drug residues in food.

Hybridity has several dimensions (Verbruggen and Havinga 2017): first, it means that actors from distinct – public and private, for-profit and non-profit – societal spheres are involved in regulation, with diverging rationalities (i.e., motivations, interests and preferences) and different definitions of the problems. Second, hybrid regulation distributes regulatory authority and tasks to different levels (e.g., territorial) using functional, hierarchical or path-

dependent criteria, where actors can simultaneously take on several regulatory roles. For example, in Switzerland, for-profit veterinarians are both the regulatees of food safety provisions and help enforce them vis-à-vis livestock owners (Sager et al. 2014). Third, hybridity sometimes refers to the combination of several regulatory approaches. While hybrid arrangements have emerged to overcome problems associated with state, industry or NGO-driven food safety governance, empirical research on the added value of hybrids is still scarce (Verbruggen and Havinga 2017).

An example of hybrid food safety regulators is accreditation bodies that are functionally public but have a semi-public law status. Accreditation is the attestation that a certification body meets the requirements to carry out specific conformity assessment activities. Accredited third-party certification is now the industry standard. Global audit service providers who provide audit and inspection services around the globe are effectively national-transnational hybrids. This industry consists of multi-national firms such as the Bureau Veritas Group, Det Norske Veritas, Lloyds, Registro Italiano Navale, SGS, and the TÜVs (Technischer Überwachungsverein). They have national subsidiaries or contracted auditors and inspectors on all continents. While these actors are all incorporated into national legal orders, they provide services across borders. Finally, the International Organization for Standardization (ISO) is a meta-organization of national (public or private) standardization bodies that sets transnational voluntary food safety standards that are available on payment of a fee. The ISO 22000 standard on “Food Safety Management Systems – Requirements for Any Organisation in the Food Chain” serves as a baseline for other standards in the domain. ISO also provides private, widely used standards for certification and accreditation services. ISO itself, however, is a private association under Swiss civil law whose members are national public, quasi-public or private standardization bodies (Verbruggen 2016).

Verbruggen (2016) outlines the synergizing effects of combining transnational and hybridized

regulation, a phenomenon he calls “regulatory enrolment”. One possible combination is that of *transnational public and national public regulators*. For example, the EU and ESFA rely on resources such as information, wealth, strategic positioning and organisational capacity to ensure uniform and coherently applied food safety rules by national governments and food safety authorities. The Commission has established a “Rapid Alert System for Food and Feed” for efficient information sharing that enables swift, collective and efficient strategies to address food incidents (see also Uglund and Veggeland 2006). An example of the combination of *transnational public and private regulators* is the interplay between Codex standards and transnational private certification schemes. States, private certification scheme owners around the globe, and the GFSI have based their schemes on the HACCP and related standards for Good Agricultural Practice (GAP) and Good Manufacturing Practice (GMP) because they are promoted by the Codex International Code of Practice General Principle of Food Hygiene (Verbruggen 2016).

A case of enrolment of *national private actors by a transnational public actor* is the promotion of “Guides to Good Hygienic Practice” in Regulation 852/2004/EC, which lays down the general hygiene requirements (Soon et al. 2012) to be respected by food business operators in the food supply chain based on HACCP principles. The design and implementation of a HACCP system demands great expertise and financial resources, which small and medium-sized enterprises (SMEs) typically lack. Therefore, Regulation 852/2004/EC offers SMEs the choice between either their own company-specific food safety management system, or a Guide to Good Hygienic Practice adopted and implemented by the food industry or a specific subsector, subject to approval by a national competent government authority. In 2015, over 400 national guides provided cost-efficient alternatives for food business operators to design individual company HACCP management systems (Verbruggen 2016). Another example is retail traceability standards. The EU General Food Law explicitly states that food business operators should have the primary legal responsibility to ensure food

safety and that they should actively participate in implementing food law requirements by verifying that such requirements are met (Fuchs and Kalfagianni 2010: 12).

The fact that public food safety authorities enforce compliance with the privately established HACCP systems illustrates the interplay between *national public authorities for food safety enforcement* and *national private food business operators*. *National public actors* are also increasingly enrolling *transnational private actors*: Public enforcement agencies in Canada, the Netherlands, the United Kingdom, and the United States (Stewart and Gostin 2011) have designed various collaborative regulatory arrangements with private assurance schemes to deploy their resources more efficiently and innovatively. While these assurance schemes have primarily been national in scope, recently, public food safety controls have been coordinated with transnational private certification schemes. For example, the Dutch Food and Consumer Product Safety Authority (NVWA) uses information from private systems of food safety control for its own enforcement activities. Compliance under private regulatory systems leads to a reduction in the frequency of official inspections. Thus, the NVWA “enrols” the information, wealth, strategic position and organisational capacity of these schemes (Verbruggen 2016).

Finally, *transnational and national private actors* may mutually strengthen their capacity to achieve their respective regulatory goals. For example, GlobalGAP provides a benchmarking process through which national schemes are recognized as equivalent to GlobalGAP certification. As a result, farmers certified by the benchmarked national schemes benefit from the worldwide acceptance of GlobalGAP in markets for fruit, vegetables, dairy, beef, poultry, pigs and plants. The strategic positioning, organisational capacity, authority and legitimacy of GlobalGAP gives them access to global supply chains for primary produce and the most profitable markets (EU, North America, Australia) (Verbruggen 2016).

Food Safety: A Wicked Problem

The transnationalization and hybridization (i.e., the process of becoming increasingly hybrid) of food safety policy are not only responses to insufficient prior responses to addressing food safety with public regulation. Indeed, they also create new and significant problems. Recently, Hamm (2009) has pointed out that food safety is best understood as a “wicked” policy problem. Wicked policies are characterized by having elements and subsystems that are highly complex and interdependent; by being extraordinarily uncertain in terms of the prevailing risks, the consequences of actions that would address those risks, and the constantly changing patterns; and by being subject to highly divergent and fragmented viewpoints, values and intentions among the actors involved (Head 2008: 103). As a consequence, attempts to solve one problem often create new problems, which are each unique and require tailor-made solutions. Multiple stakeholders diverge in their perceptions about what the problems and their causes are. Their judgements influence which solutions are adopted (Hamm 2009; Tosun 2017). I will now illustrate some implications of the complexity, uncertainty, divergence and fragmentation inherent in food safety policies.

Complexity

The global and interconnected dimension of food safety policy results in a high degree of complexity. One consequence is the co-existence of multiple and multi-levelled regulatory regimes and actor structures whose rules and goals can compete with one another. As a consequence, bilateral agreements may not achieve higher levels of food safety. For example, the Transatlantic Trade and Investment Partnership (TTIP) was found to erode EU food safety standards since the latter could create unfair advantages for trade partners that are not bound to them (Marks 2015: 925). At national and subnational levels, there are typically multiple agencies responsible for coordinating and enforcing different food safety laws, labels, and standards. For example, in the United States, food additives and pesticide residues are

regulated at the federal level, while local health departments and health commissions are responsible for enforcing laws regarding the cleanliness of food preparation areas, expiration dates, and the storage of eggs as well as dairy (DeWaal 2007; Robson 2013; Stewart and Gostin 2011; Zweigenbaum 2011). Coordination is, therefore, a key issue.

More generally, the complex interdependencies between socioeconomic and policy forces in the food system create a wide array of poorly understood drivers and policy options for advancing public health. The fact that so many variables are at play makes it particularly challenging to identify the public health outcomes of particular policies. Additionally, one policy can negate the effectiveness of another policy. For example, the benefits of local community incentives for organic products in convenience stores could be overwhelmed by federal policies that create a favorable business environment for the production of highly processed foods. For individual professionals implementing and enforcing food and agricultural policy, it is particularly hard to understand and consider the numerous policy drivers that impact the food system, ranging from agricultural commodity policies to local food safety ordinances. Confronted with this complexity, these actors often focus on narrow objectives and disregarding the larger system, rather than considering the full range of interdependent policies that affect the system from a systems-based perspective (Muller et al. 2009).

Finally, whereas private modes of food safety regulation have effectively resulted in tailor-made governance tools along the complex food chain, they have also created losers in the process. As mentioned earlier, the evidence about the impact of private food safety standards on developing countries is inconclusive (Hensen and Humphrey 2010; Stanton 2012). On the one hand, GFSI schemes and other private food safety schemes and standards reinforce existing, unjustified and unnecessary barriers to international trade for developing countries (Marks 2015: 965). The high implementation costs of such private certification schemes also

tend to push small farmers, especially landless and female-headed households, out of the market in favor of large agribusinesses and food processors. These developments demonstrably contribute to the ongoing rural exodus and hence, the building of urban slums in countries with long-term economic maldevelopment. The benefits in terms of food safety and diversity accrue disproportionately to a small segment of the global population. Conversely, “the majority of the global poor (also representing the majority of global population) gain little—and many may lose—from retail authority in global food governance” (Fuchs and Kalfagianni 2010: 9-10). On the other hand, in some sectors and regions, smallholders have maintained or even enhanced their role in export value chains. Private standards can also act as catalysts for upgrading processes and competitive positioning in international markets for developing countries (Maertens and Swinnen 2012). More generally, private standards represent a new form of value chain governance that will not disappear, but further evolve in the future (Henson and Humphrey 2010).

But even in developed producing countries, the shift in responsibility to the producer and the scientification of regulations has been detrimental to some small food processors. For example, many small producers in the United States lack the expertise and resources to invest in adapting their plant equipment to the HACCP. For them, potentially insurmountable challenges posed by HACCP regulations eliminated the viability of particular products and forced some of them out of business. Hence, reliance of the HACCP on science has not only limited the participation of a particular kind of small actor, but has also precluded the possibility that the regulatory system might learn from their experience. The HACCP thus produced a particular kind of stakeholder that can viably exist in the system, while eliminating others (Wengle 2016).

Uncertainty

Uncertainty is an inherent feature of any attempt to ensure safe food. The rise of new and

previously unknown threats to food safety, as well as their perception in the public discourse, have played a key role in the emergence of contemporary modes of food governance (Figué 2014; Scallan et al. 2011). These threats frequently present situations in which the relationship between activities and their potential hazards cannot be established before the risk arises. However, uncertainty may lead to conflicts among policy makers who have different perceptions, which in turn can turn the issue into one that is highly politicized. For this reason, the precautionary principle, driven by “serious suspicions of danger”, is key. The precautionary principle is an abstract legal principle that enables policy makers to take regulatory action before risks materialize in order to prevent unnecessary harm. Typically such policies impose constraints on the actions of target groups (e.g., bans on the production or sale of certain products). For example, the poor management of food scandals has led to a politicization of food safety issues, which has led EU policy makers to address these risk on the basis of the precautionary principle in order to restore the public’s trust and the policy makers’ legitimacy (Tosun 2013).

Uncertainty not only affects policymaking, but also both public and private implementation and enforcement practices. For example, given the enormous amount of production sites, risk-based sampling inspection procedures are a promising and increasingly popular method for performing food safety inspections in primary production (Starbird 2005). However, these procedures also require that data about prior risk behavior is available, which is best achieved through data-sharing between public and private regulators. There is, hence, a close relationship between complexity and uncertainty in food safety policy.

Divergence and Fragmentation

The hybridization of food safety governance has created a fragmented actor landscape. The multiple actors involved often diverge in how they define the problems and their strategic intentions (“rationalities”). On the one hand, the food industry, the retail industry, and

government share an interest in guaranteeing the safety and quality of food. Major food safety issues and recalls affect retailers, manufacturers, and governments, even if none are to blame for the problem (Havinga 2006). On the other hand, the hybrid nature of food safety governance results in multiple and sometimes conflicting interests and goals of actors. It can also create an overlap of several regulatory roles that affect effectiveness and legitimacy in the decision-making and implementation of food safety policy.

As Cafaggi (2011) highlights, contractual networks can result in conflicting goals and interests. On the one hand, there is the private dimension represented by food safety and quality supply management. On the other hand, there are states and regional (European) liability and regulatory systems requiring networks to provide organisational responses to meet the goals of public regulation. As a result, there is often a different logic applied to the practice of food safety governance depending on whether the actor is private or public. By involving both public, food safety interests, and market interests, hybrid structures tend to multiply the regulatory actors' social roles and resulting accountabilities, which are often difficult to reconcile (Thomann and Sager 2017; Thomann et al. 2017).

The literature provides many examples of such divergences. For instance, when private auditors are paid for by their auditees, their lack of independence prevents an objective audit. Auditors have a financial interest in getting (re)hired by suppliers. As profit maximizers, suppliers naturally opt for the cheapest certification they can obtain. At the same time, auditors also have a professional obligation to report food safety risks. This can lead certifiers to lower their standards of inspection in order to avoid losing their customers whose activities they are supposed to assess and monitor (Marks 2015). In Switzerland, private veterinarians monitor how well livestock producers comply with food safety regulations, but do so for a profit. This can lead to situations in which the economic dependence of the private veterinarians on the farmers as their customers impedes effective enforcement of the rules

(Sager et al. 2014). Lytton and McAllister (2014) document similar problems for private third-party auditing in the United States.

Marks (2015: 950ff) documents other perils associated with third-party certification. For example, over-reliance on the “checklist” mentality and auditor incompetence were crucial factors in the deadly 2011 Colorado Listeria Outbreak that was ultimately sourced to Colorado-based cantaloupe farmers. Additionally, the absence of a requirement to disclose can be problematic: when systems, auditors, and inspectors are not required to advise and alert a public agency of situations involving major non-compliance and serious risk to public health and safety, non-compliant firms may slip through the cracks in the system.

The multi-level structures through which food safety policy is implemented also creates very diverse and fragmented policy outcomes. In the EU context, member states “customize” EU food safety rules to adapt them to their local contexts, interest constellations, and regulatory styles. While this “legitimate diversity” is an intended aspect of the European experience, little is known about its causes and its consequences for jointly ensuring food safety in the European single market (Thomann 2015a). Havinga (2014: 51) additionally highlights “that in order to understand what happens on the ground it is important to look beyond transposition or direct effect and also to investigate the implementation of regulations and to dig deeper than just their transposition”. For example, the practical application of industry guides for good hygienic practice is quite different in the Netherlands and Scotland. This is because their different food governance networks used the flexibility of EU regulation either to maximize or to minimize the use of industry guides (Havinga 2014). Thomann (2015b) also finds striking differences and a general deficit in the subnational implementation of Swiss food safety inspection requirements. Taken together, these kind of findings suggest that much more attention needs to be paid to how food safety policy is implemented in practice, and what the implications are.

Ways Ahead

We have seen that wicked problems pose specific challenges that require new processes and ways of thinking. This includes the ability to work across agency boundaries, the ability to debate the appropriate accountability framework, to engage stakeholders and citizens in understanding the problem and identifying possible solutions, to develop skills in communication, to engage in big picture thinking and the ability to work cooperatively. Policy makers need to develop a better understanding of behavioural change, a comprehensive focus and/or strategy, and ultimately accept uncertainty and the need for a long-term focus (Head 2008; e.g., Yiannas 2010). Using the example of sustainable food production of the Common Agricultural Policy, Termeer et al. (2015) identify reflexivity, resilience, and responsiveness as essential governance capabilities. I will now outline new approaches to reflexivity, resilience and responsiveness in contemporary food safety policy.

Reflexivity

Reflexivity is the capability to deal with multiple frames (Termeer et al. 2015). Because of the challenges for individual national, international, public, and private regulators to devise effective and legitimate food safety governance systems, there has been an increase in the level of bottom-up coordination of regulatory activities among nations (Verbruggen 2016). For example, Ugland and Veggeland (2006) illustrate how the EU has engaged in increased policy integration. Policy integration enhances policy consistency, meaning that normative and behavioural structures are coupled and the various policy activities cohere with some common objective. Policy integration capitalizes on policy interdependence, where various policy components are interlinked and causally linked with official objectives. It also takes into account structural connectedness, where policy is made in the context of a network of actors and institutions. Integration happens within policy sectors (intrasectoral policy integration) and across policy sectors (inter-sectoral policy integration). In the EU, the food

safety policy issue first had to be dealt with independently and in an integrated fashion within policy sectors before it could be successfully spread across different policy sectors.

The shift toward transnational private regulation has generally brought about a tighter linking of food safety and environmental and social policies. Commercial contracts along the supply chain now include clauses regarding all of these aspects (Cafaggi 2012). Similarly, countries like the UK, Norway, and Finland have reformed their food safety systems by linking policy areas and drawing on a new ecological public health approach. More joined-up approaches to public health and a sustainable food supply facilitate integrated policy advice. Prior institutional reforms to UK food policy reflected a bounded approach to policy integration. At the local and community levels in the UK, local food initiatives advanced policy alternatives in an ad hoc fashion (Barling et al. 2002).

One instance of this is local and national food policy councils which have proven effective in developing comprehensive food systems policies that can improve public health. These councils reflect a holistic approach to food production, land use, agricultural development, livestock management, food distribution, retail, and food assistance. The councils examine the existing food system and its correlation to public health indicators; they determine assets, gaps, and inconsistencies; and they identify policies or programs that could benefit public health and local food economies. While facing viability and endurance challenges—specifically, funding, staffing, and government support—food policy councils can provide breadth and synergy to address dynamic and complex issues. They close the gap among stakeholders and policy-makers. Conversations and networking among diverse councils offer a productive and creative venue to advance policies (Muller et al. 2009).

Another strand of literature emphasizes the role of issue definition and (competitive) framing for food safety policy change (Dunlop 2007; Figuié 2014). Using the example of the sale of raw milk, Rahn et al. (2016) show that a frame emphasizing consumer choice and food

freedom can be more effective than a frame emphasizing public health risks. Their study highlights the advantages of considering psychological and policy processes simultaneously to understand policy change.

Resilience

Resilience refers to the capability to adjust actions to uncertain changes (Termeer et al. 2015). The precautionary principle increasingly characterizes food safety regulation. The precautionary principle illustrates a preference for an ex ante preventative approach over a regime of the ex post detection of violations. This minimizes risks and improves the effectiveness and efficiency of control at the source of the hazard. One example of this is traceability systems that have heightened the transparency of the regulatory process and the allocation of tasks along the chain. Traceability increases consumer confidence, ensures competition by differentiating products, decreases costs when product recalls are necessary, and improves risk management when hazards emerge (Cafaggi 2012).

Experimentalist and network governance also increase resilience. Experimentalist governance is a recursive process of provisional goal-setting and revision based on learning from the comparison of alternative approaches and advancing them in different contexts (Sabel and Zeitlin 2010). The EFSA and its scientific cooperation with Competent Authorities (CAs) in the member states is an interesting example. These authorities are jointly responsible for risk assessments. Three factors determine the success of such cooperation: a strategic vision, wider institutional structures fitting daily work, and mechanisms to facilitate and enhance cooperation among partners. This experimentalist governance model represents a carefully designed architecture of networking between the national and European levels that incorporates national capacities into European science making (Abels et al. 2014: 91-92).

The HACCP technique, which has been widely adopted, is another example of resilience designed to detect hazards at the optimal point of the food chain (Cafaggi 2012). According to

Wengle (2016), it bears central features of experimentalist governance: a new form of regulation that is flexible, responsive, and involves stakeholders in iterative and direct democratic deliberation. While producers are required to design and implement HACCP plans according to a particular methodology, they are free to decide the particular steps and processes. The criteria that are used to justify a HACCP plan are based on food science. The HACCP is based on self-regulation because responsibility for guaranteeing food safety lies wholly with producers. Its scientific approach to controlling food-borne hazards means that every regulatory decision and every plant-level procedure has to be justified with scientifically valid studies. This system allows rules to be challenged with information from new studies, and innovations can be validated with new research.

Responsiveness

Responsiveness means the capability to respond to changing agendas and expectations (Termeer et al. 2015). Nowadays in Europe, Green parties in particular, have proactively pushed for the consideration of the needs and interests of a diverse set of stakeholders during the process of agri-food policy making (Daugberg and Feindth 2017; Tosun 2017). In the food safety sector, policy learning reflects responsiveness (Dunlop and James 2007; Sabel and Zeitlin 2010). Havinga (2006) effectively describes a process in which Dutch retailers emulated the British food safety assurance scheme (British Retail Consortium standard) in 2001. It was less expensive than developing its own standard, and it had proven to function well. Similarly, in 2003, the American Food Marketing Institute acquired the Australian food safety standard, SQF.

Arguably, food safety regulation has generally become more responsive. Modern food safety laws in the EU, US, and Canada build on private systems and leave flexibility for national governments and for food business operators to adapt the regulations to local circumstances. This flexibility is another feature of experimentalist governance (Zeitlin 2015). In particular,

private food safety schemes are able to react immediately to new problems. Conversely, adapting public regulations takes much more time – even if public authorities can take immediate measures where public health is in danger. For example, after the horse meat fraud in 2013 in which foods advertised as containing beef were found to contain undeclared or improperly declared, private food safety schemes immediately stipulated that a policy of authenticity checks be required for certification. Finally, private schemes and the GFSI have responded to various criticisms (for example, about the reliability of audits and certification, difficulties for smaller businesses and farmers in developing countries, and insufficient motivations of food business operators) by developing special programs or including new requirements.

Toward Effective Food Safety Governance of Food Safety

In summary, food safety policy is witnessing a new regulatory paradigm defined by privatization, decentralization, public participation, horizontal coordination, experimentation, and a solution-oriented focus. Though this new paradigm is orchestrated by governments, other public, private, and nongovernmental entities are engaged in co-regulation. The state incorporates a decentralized range of actors and institutions, both public and private, into the regulatory system, and relies on these actors for regulatory expertise. An orchestration of public and private actors and institutions is favoured over the direct promulgation and enforcement of rules and “soft law” complements or substitutes for mandatory “hard law” (Marks 2015: 940-941).

Food safety can be seen as a wicked policy problem. First, the complexity of new modes of food safety regulation has created competing regulatory regimes which can level each other out and require high levels of coordination between actors. This complexity also makes it difficult for individual actors to understand what action they have to take to improve food safety. By being closely tied to specific modes of production, these new modes have created

both winners and losers around the globe. Second, uncertainty is often attached to food-related health risks; uncertainty affects both decision-making and enforcement of food safety policy and is further augmented by complexity. Third, the fragmented actor landscape in food safety policy has important implications for how actors behave when putting it into practice. The resulting diversity goes hand in hand with inherent trade-offs between different competing actor rationalities and goals.

In response to this “wickedness”, some new forms of food safety governance also show an increased capacity to deal with multiple frames by involving policy integration, joined-up and local initiatives, and competitive framing. Traceability systems, experimentalist and network governance and HACCP plans help adjust actions to uncertain changes. To respond to changing agendas and expectations, actors engage in policy learning and build flexible private systems of governance, schemes, and GFSI.

More research is needed to identify the conditions under which such regulatory structures ensure effective food safety (e.g., Scharff et al. 2009). Evidence suggests that the conditions required to effectively protect the public interest by self-regulation in the food industry include an overlap of norms, objectives, and interests of public and private regulation; effective monitoring and enforcing the compliance of companies; the potential for self-evaluation; compliance with due process standards; and information management and data sharing (Havinga 2006; Verbruggen 2013). Lytton and McAllister (2014) highlight the usefulness of buyer vigilance and other mechanisms to ensure adequate accountability structures, including tort litigation, liability insurance, accreditation, benchmarking, media coverage, and network configurations. This way, public, private, and civil society actors can jointly provide adequate solutions to the wicked and transnational problem of food safety (Havinga et al. 2015; Head and Alford 2015).

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