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Science and Power in Global Food Regulation: The Rise of the Codex Alimentarius

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Abstract

The emergence of the global administrative sector and its new forms of knowledge production, expert rationality, and standardization, remains an understudied topic in science studies. Using a coproductionist theoretical framework, we argue that the mutual construction of epistemic and legal authority across international organizations has been critical for constituting and stabilizing a global regime for the regulation of food safety. The authors demonstrate how this process has also given rise to an authoritative framework for risk analysis touted as "scientifically rigorous" but embodying particular value choices regarding health, environment, and the dispensation of regulatory power. Finally, the authors trace how enrollment of the Codex Alimentarius in World Trade Law has heightened institutional dilemmas around legitimacy and credibility in science advice at the global level. Taken together, the case illustrates the importance of attending to the iterative construction of law and science in the constitution of new global administrative regimes.

Keywords

Codex Alimentarius, food regulation, WTO, regulatory science, Administrative Law

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Increasing global interdependence in such fields as trade, security, development, and environment has given rise to a new layer of transnational regulation and administration. As a result, new international bodies have emerged with varying degrees of authority to direct the regulatory choices of nation states (Kingsbury, Krisch, and Stewart, 2005). Scholars in law and international relations have begun to develop sustained interest in this global administrative sector and the powerful role of knowledge therein (e.g., Haas 1989; Esty 2002). Nevertheless, it has been scholars in science and technology studies (STS) who have identified the special importance of the *epistemic* within these international institutions. This work has connected the development of global knowledge-making, the politics of expertise, and standardized forms of reasoning with themes of legitimation and power distribution (e.g., Jasanoff and Martello 2004; Featherstone and Venn 2006; Miller 2007). There is less scholarship examining the processes by which scientific authority and legal authority work simultaneously to bring global knowledge regimes into being.

The international trading regime and its associated regulatory bodies are a key site of inquiry in this regard. The Codex Alimentarius Commission (Codex) is an international body based in Rome that promulgates standards, guidelines, and codes of practice in the realm of food safety. Established by the Food and Agricultural Organization (FAO) and the World Health Organization (WHO) in 1963, the power of the Codex in standardizing the regulation of health, trade, and environment changed radically in 1994 when the World Trade Organization (WTO) elevated its legal status within the global trading regime. Under the new Sanitary and Phytosanitary (SPS) Agreement, WTO member states can sue other members for maintaining food and environmental safety standards that are stricter than Codex standards. Legally, this makes the Codex an authoritative international agency for "food additives, veterinary drug and pesticide residues, contaminants, methods of analysis and sampling, and codes and guidelines of hygienic practice" (WTO 1994, Annex A(3)(a)). In the process, the Codex has become an important exemplar of a global administrative system that is enlarging its reach and power.

The political stakes of attending to the developmental process of the Codex, an example of what Featherstone and Venn call a "circuit of global knowledge" (2006) and what Miller calls an "international knowledge institution" (2007) are high: in the upcoming years, different players will struggle in this forum to normalize particular accounts of food safety and environment and standardize particular regulatory rationalities. More generally, a better understanding of the interplay of global knowledge institutions and emergent

regulatory regimes could help produce more effective and acceptable global governance in crucial domains such as environment and health.

Primary documents produced by the WTO, the Codex itself, and its scientific advisory committees illustrate that particular interactions of political and expert authority have been instrumental in shaping the developmental trajectory of the Codex during and after its uptake into WTO law. First, the emergence of a global food safety regime has relied on a process of mutual legitimation across organizations and their differing types of authority. Requiring a solution to the difficult political problem of how to promote regulatory convergence, the WTO relied critically on a particular ideology of regulatory science and the Codex's expert authority. In return, the Codex's invocation of the WTO's legal power proved crucial in producing a global "science-based" framework for risk analysis. Second, shifts in Codex's procedures on standard-making and science advice reveal an institutional struggle to preserve the Codex's identity as a technocratic agency even as its global power suddenly expanded. Taken together, the case illustrates the importance of attending to the iterative construction of legal and epistemic authority in understanding the constitution of global regulatory power.

Coproduction and the Global Food Safety Regime

In the last fifteen years, the Codex transitioned from a largely invisible standard-setting body to a global regulatory agency, enshrining an authoritative discourse of "risk analysis." To help explore how this occurred, it is useful to draw upon what STS scholars have called "the coproductionist idiom." Practices and norms traditionally organized under the two discrete headings of science and politics often interact closely to produce hybrid regimes of knowledge and power (Jasanoff 2004). STS scholars working in this idiom have long shown how the administrative agency at the state level has been an important site of boundary work, standardization, and deliberative discourses that powerfully order our world (e.g., Jasanoff 1990; Hajer 1995; Porter 1995). The analytics of coproduction have also been useful for unpacking the modalities of knowledge-based institutions in global governance (e.g., Fogel 2004; Miller 2004). So too does coproduction offer a useful theoretical framework for understanding the new global administrative space produced by the WTO and the Codex: this lens reveals crucial dynamics in the emergence of the Codex and its formalized regime of risk analysis.

Birth of a Global Agency

The SPS Agreement has been described as one of the most ambitious achievements of the Uruguay Round of trade negotiations that created the WTO, in part because of its goal of rationalizing food safety regulation across its member states (Charnovitz 2000). Although the primary purpose of the General Agreement on Tariffs and Trade (GATT) is to prevent discriminatory trade practices (see e.g., Weiler 2000), negotiators in the domain of food safety aimed at a further substantive goal of rationalization and harmonization of food standards across nations. Producing convergent standards was seen as an important way of promoting the freer exchange of food across borders, while still acknowledging the necessity of state-based food safety regulation. The final text of the SPS Agreement reveals how science itself became the primary ideological resource for achieving rationalization (Wirth 1994; Walker 2003). Under Article 2 of the Agreement, members must ensure that any sanitary or phytosanitary measure "is based on scientific principles and is not maintained without sufficient scientific evidence" (WTO 1994, Article 2.2). Relying on the authority of science to discipline food safety regulation took pressure off lawyers and delegates, by appealing to a supposedly neutral arbiter to do the work of harmonization (Walker 2003).

Seeking acceptable means of harmonizing standards across WTO member states, SPS negotiators looked around the world for existing international food standards.[1] They found the Codex, a little known bureau of the FAO and WHO that had been producing voluntary food safety standards on pesticide residues, additives, etc., since the 1960s. Accordingly, within the SPS Agreement, the Codex was designated one of three "relevant international organizations" around whose standards the signatories would attempt to harmonize (WTO 1994, Article 3.4).[2] The guidelines and recommendations of Codex, if adopted by nations, would "be deemed to be necessary to protect human, animal, or plant life or health, and presumed to be consistent with the relevant provisions of this Agreement and of GATT 1994" (WTO 1994, Article 3.2). To satisfy the core science-based obligations, WTO members would have to either adopt existing international health and safety standards or justify deviant measures with risk assessment and "sufficient scientific evidence" (WTO 1994, Articles 3.2, 5).

The SPS negotiating history and text evince a strong commitment to a technocratic paradigm of global regulation that is in tension with the traditional regulatory sovereignty of states. Although the GATT-WTO system as a whole may represent the "the high water mark of the twentieth-century commitment to technocratic decisonmaking" (Esty 2002, 10), the SPS

Agreement stands as perhaps the most extreme example. The effort to rationalize food safety regulation presents a clear challenge to the principles of state sovereignty in a sphere of "social regulation." Where political legitimacy may be insufficient, a legitimacy based on technocratic rationality and the universal claims of science is implicitly offered in its place.[3]

Just how and why negotiators across the trading community came to agree on the "science-based" SPS text is not a trivial question, especially because individual European states had been resisting the introduction of American meat products containing hormones based mostly on consumer concerns. Achieving agreement on these provisions was no small feat, as sovereign member states were clearly risking the loss of regulatory discretion to the dictates of a newly constituted global regulatory rationality. The United States was pushing science as a means of trumping consumer-driven bans on beef and milk hormones in European states. Certainly, the fact that Europe was being represented by the European Commission (EC)—an entity that was engaged in its own difficult project of harmonizing "social regulation" across EU Member States (Joerges 1997)—had something to do with its willingness to embrace scientific universalism and risk analysis as a harmonizing force within the SPS Agreement. Given the alignment of interests across the United States and the EC, rationalization through risk assessment was a plausible enough ideological concept around which to forge agreement.[4] The SPS negotiators were able to find a mutually acceptable solution to the difficult problems of regulatory harmonization by identifying a universalist framework of epistemic warrant, namely risk analysis and enrolling an international regulatory body supposedly devoted to it.[5]

The central coproductionist point is this: although the trading regime claimed to be adopting pre-existing science-based standards at the international level, the WTO's legal and executive power was necessary to transform the Codex into a global agency that could generate such standards. The Codex had been an international body with fairly low visibility (e.g., Salter 1988; Hüller and Maier 2006). As its increase in power became imminent, the Codex began acting with an invigorated mandate and sense of itself as a "science-based" organization.

It was the rising trading system that drove the development of new norms and practices for the management of knowledge, expertise, and evidence in regulatory decision making at the Codex—in short, its regulatory epistemology. Derivative of the broader concept of "civic epistemology" (Jasanoff 2004), regulatory epistemology points to embedded ways of knowing, standards of proof and credibility within regulatory cultures at different scales of governance. As it became clear by 1991 that Codex

would play a significant role in the trade regime (FAO/WHO 1991; Victor 1999), major Codex actors agreed that it would have to formalize its science-based account of food safety regulation (CAC 1991). A patchwork of different risk analysis processes had come to operate in different areas of Codex regulation before the conclusion of the Uruguay Round (Hathaway 1993; Joint FAO/WHO Expert Consultation 1995; Jukes 2000). Moves to standardize these procedures were motivated directly by the anticipated outcome of the Uruguay round: there was a general recognition that the Codex standard-setting process needed to be more consistent, science-based, and transparent (see e.g. CAC 1991; FAO/WHO 1991; McNally 1991; Jukes 2000).

This move to shore up Codex science crystallized amidst controversies over growth-promoting hormones in beef cattle and recombinant Bovine Somatotropin (BST; Jukes 2000). In 1991, a Codex vote to reject standards on four meat hormones (CAC 1991) elicited an aggressive response from the United States.[7] Following this vote, the U.S. delegation submitted a strong proposal that all "draft standards recommended by a Codex Committee ... based on thorough scientific assessments by JECFA [Joint Expert Committee on Food Additives]" be universally adopted, "[u]nless new scientific information is presented by a delegation which calls into question the validity of the draft standard" (CCExec 1992, para. 56). The U.S. policy paper specified how Codex might make good on its pre-existing agreement to review "all Codex standards as to their current relevance and sound scientific basis, with a view to facilitating international trade" (CAC 1991, app. 4, para. 10; FAO/WHO 1991).

As the debate about the role of science in food regulation was playing out in the context of the Uruguay round and bovine "production aids," it began to merge with discussions about general methodology, especially the development of more formalized procedures for risk analysis. The Codex Executive Committee, when considering the U.S. proposal mentioned above, wrote that "[t]he draft GATT/Uruguay Round SPS decision, which invoked the concepts of risk assessment, equivalency and transparency, was ... very relevant in terms of making scientific determinations" (CCExec 1992, para. 57). After the issue was forwarded to the Codex Committee on General Principles (CCGP 1992, 1994) and back, the Executive Committee began to explicitly review the "implications of the Uruguay Round Agreements for Codex." This review concluded, inter alia, that "scientific analysis and advice, together with risk analysis, should form the basis of the development of standards" and that "a consistent approach to risk management in the specification of Codex Standards ... be developed and

documented" (CCExec 1994, para. 22-23). To be sure, risk analysis was not a new concept within the Codex. However, throughout the 1990s, the trade negotiations would push along the process of standardizing it at Codex.

By March 1995, just months after the new WTO came into being, there was self-recognition that its new status in WTO law had transformed the Codex from a voluntary standard-setting organization to a global agency. At that point, Codex convened the *Joint FAO/WHO Expert Consultation on the Application of Risk Analysis to Food Standards Issues*, which noted how,

> [f]or the first time, an international trade agreement, the SPS Agreement, explicitly recognizes that for establishment of rational harmonized regulations and standards for food in international trade a rigorous scientific process is required. Consequently, for food, CAC [the Codex Alimentarius Commission] is required to provide the scientific framework on which adherence to the SPS Agreement will be based. (Joint FAO/WHO Expert Consultation 1995, 5)

What is so interesting here is that the Codex had not developed a formalized "scientific framework" for food regulation prior to this moment. In fact, the consultation recommended "several changes in Codex practices to foster a harmonized approach within Codex, consistent with science-based risk assessment" (*Id*. at 1).

It is precisely the trading regime's power, with its new legislation and new binding adjudication system, and the delegation of that authority, that enabled the Codex to define the parameters of sound science for regulation. Just as the WTO addressed problems of legitimacy in the legal/economic order by identifying a common trust in scientific rigor and existing international expertise, so too the Codex addressed difficult questions regarding the role of science in regulatory process through legitimation received from the WTO. In effect, the SPS negotiators and the trading regime had to produce the very science-based agency it had identified as its foundation.

The New Risk Analysis Regime

The formation of the new food-risk regime deserves close tracking, for it helped establish a regulatory epistemology with truly global scope and authority. As we will see, the sustenance of the Codex's newly vested authority necessitated newly formalized strategies of purification and boundary work (Jasanoff 1990; Gieryn 1999). Furthermore, boundary-drawing rules helped stabilize a particular stance on the science-policy

relationship, facilitating the more rapid formation of standards, but marginalizing concerns that did not fit neatly into the risk framework.

The process for *Codex-wide Development and Application of Risk Analysis Principles and Guidelines* began in 1997 as an attempt to draft uniform standards for application both within the Codex and by member countries. Agreement proved difficult on such broad principles, so the two processes split. The *Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius* (FAO/WHO 2006a) were adopted in 2003,[8] while the *Working Principles for Risk Analysis for Application by Governments* were finally completed in 2007 (CAC 2007).

In both sets of principles, risk analysis is broken up into three "distinct but closely linked" components: risk assessment, risk management, and risk communication. Risk assessment is defined as a scientifically based process of moving from hazard identification to risk characterization. Risk management, however, is the process of weighing policy alternatives and selecting the appropriate prevention and control options. Risk communication involves both communication between risk assessors and risk managers and communication with other outside parties (CCGP 2007). The relationship between risk assessors and risk managers should be functionally separate, "in order to ensure the scientific integrity of the risk assessment . . . " (FAO/WHO 2006a, 104). However, it is recognized that the relationship between the two should be interactive, even iterative. For example, it is recognized that a "risk assessment policy" will have to be developed transparently to guide "choice of options and associated judgments for their application at appropriate decision points in the risk assessment such that the scientific integrity of the process is maintained." (FAO/WHO 2006a, 44) This statement acknowledges the value judgments that frequently underpin the conduct of risk assessment, and that these judgments should be jointly developed by technical and policy people.

A number of evaluative points about this global framework for food safety are in order. By emphasizing risk analysis as an interactive and iterative process across its three parts, the Codex risk principles avoid a stark conceptual separation of technical and political phases in risk analysis that can tend to hide value-based decisions within the risk assessment phase (Winickoff et al., 2005, 93-106). Nevertheless, the division between assessment and management remain, which may render particular value choices more opaque.

Furthermore, by adopting risk as the single dominant grammar of global food regulation, certain governance biases may be introduced. Risk discourse implicitly empowers some people as experts while marginalizing others as

inarticulate or irrelevant (Jasanoff 1999). Two groups who regularly find it difficult to express their interests in risk discourse are developing countries and consumers: developing countries due to the lack of access to measurement equipment and other technologies of quantification (see e.g., CAC 2007, 194) and consumers due to difficulties framing cultural, religious, and other concerns not strictly related to safety (e.g., Bureau and Marette 2000).

Finally, the adoption of the risk analysis framework tends to supplant other potential frameworks and has marginalized environmental, economic, and other potential factors in food safety regulation. For instance, the SPS agreement together with the newly entrenched framework at Codex has also suppressed mention of the precautionary principle, arguably because of the difficulty of standardizing precautionary approaches (Post 2006). For instance, the Principles and Guidelines for Microbiological Risk Management, mired in debate for a decade with the use of the term precaution as one of the major sticking points, was finally adopted at the 2007 session of the Codex, with no mention of the term[9] (CCFH 2006; CAC 2007).

The trajectory of the debate surrounding the so-called "other legitimate factors" tends to corroborate this point. In 1995, a general decision of the Commission entitled *Statements of Principle Concerning the Role of Science in the Codex Decision-Making Process and the Extent to which Other Factors Are Taken Into Account* states that "food standards ... shall be based on the principle of sound scientific analysis and evidence ...," but that the "Codex Alimentarius will have regard, where appropriate, to other legitimate factors relevant for the health protection of consumers and for the protection of fair practices in food trade" (FAO/WHO 2006a, 164). The "other legitimate factors" language emerged against the backdrop of the beef and milk hormones controversies, from the insistence by certain delegations, led by a number of European countries, that issues beyond science—particularly environmental impacts, economic feasibility, and ethical concerns—be considered relevant to food safety.[10] However, in the last half decade, the debate surrounding other legitimate factors has begun to fade as risk standardization has advanced.

The foregoing analysis suggests that far from taking up a pre-existing regime of science-based food regulation, the WTO actually brought one into being. Discursive choices and analytical methodologies often form critical elements in institutional efforts to shore up new structures of technical authority (Porter 1995; Jasanoff 2005). The Codex case corroborates this insight. With the WTO's help, risk analysis has become the very grammar of Codex decision making and of the emergent global regulatory regime for food. Although parties may differ in their positions about what should be

included in a risk analysis, the idea that standards must be based on a risk analysis is now unquestioned (see e.g., CAC 1997, 162).

Stabilization of Codex Decision-Making Procedures

As others have noted, the new role of Codex in the trading regime transformed its ethos from more of a "gentleman's club," to an overtly politicized organization (e.g., Powell 1997; Veggeland and Borgen 2002). Less noted, however, have been Codex efforts to negotiate a difficult dilemma wrought by these changes: how to stabilize its primary identity as a technical rather than political agency, even as its enhanced legal status heightened its political import. In its struggles to rediscover procedural normality and to implement geographical representation on expert committees, we see the Codex staking its claim as a bona fide global agency through the development of hybrid procedures mixing technocratic and democratic elements. Yet, we also see continuous self-positioning as a science-based organization amidst the increasingly difficult political work it must accomplish.

The Codex, whose membership currently stands at 181 nations, is open to all Member Nations and Associate Members of FAO and/or WHO. All nations are entitled to send one representative with an attendant delegation to annual commission-wide meetings. The commission elects a chair and three vice-chairs, and each of the seven Codex geographic regions elects their own coordinator and regional representative to the Executive Board. These fourteen regional representatives, plus the chair and vice-chairs make up the Executive Board. In addition, other subsidiary bodies, called committees, focus on specific subjects or commodities and do the work of drafting or finalizing standards for submission to the Commission as a whole. General Subject Committees perform "horizontal" work that applies across the board to all commodity standards. The CCGP, Codex Committee on Food Additives (CCFA), and Codex Committee on Residues of Veterinary Drugs in Foods (CCRVDF) are examples of General Subject Committees. Commodity Committees perform the "vertical" work of developing standards for specific foods. For example, the Codex Committee on Fats and Oils, and the Codex Committee on Milk and Milk Products are Commodity Committees (FAO/WHO 2006a).

A number of standing and ad hoc expert committees, coordinated by the FAO and WHO, support the work of the Codex. The most important of these committees are the Joint FAO/WHO Expert Committee on Food Additives (JECFA), the Joint FAO/WHO Meetings on Pesticide Residues (JMPR), and the Joint FAO/WHO Meetings on Microbiological Risk

Assessment (JEMRA). Although not officially part of the Codex, the activities of these committees are coordinated by the FAO and WHO to advise the Codex as needed. The process for drafting and approving a new Codex standard is shown in figure 1.

The WTO-Wrought Disruption in Codex Procedure

The formal decision rule within the Codex is "one country, one vote," and a majority of attending members can set standards and a two-thirds majority can make changes to the organization's procedural structure (FAO/WHO 2006a). Indeed, the use of voting indicates how the Codex has been, from the beginning, a hybrid space of politics and technocratic expertise with explicit mandates to consider both science and economic impacts as it develops standards (Salter 1988). Nevertheless, prior to the enactment of the SPS Agreement, consensus in decision making both within the Codex and its scientific advisory committees was the strong customary norm. Nations did not always agree about the standards being debated. Nevertheless, the nonbinding nature of the regulations created no incentive for nations to block them by disagreeing. Rather, they simply abstained from voting, allowing standards to pass, but refrained from implementing them domestically.

The passage of the SPS agreement changed decision-making practices starting in the 1990s, as outcomes there took on new legal import within trade law. Where decision by consensus previously reigned, bursts of voting occurred in 1995 and again in 1997 for a number of meat hormones, a standard for natural mineral waters, and guidelines for food import and export inspection certification systems (see figure 2). In the immediately post-SPS Codex, it seemed, abstention was no longer sensible behavior for a dissenting nation. A 2002 FAO-and-WHO-sponsored evaluation of the Codex traced these changes to the trading regime (Traill et al. 2002).

This newfound legal status not only made compromise more difficult, it brought previously enacted standards into question: would standards enacted before the Codex's uptake into WTO law provide the legal default standard, and would they be enforced even when the challenged country voted against the standard? These issues emerged explicitly within WTO litigation. In *EC Beef Hormones*, the first case brought under the SPS Agreement, the EC argued before the Panel that,

> the Codex and the SPS Agreement did not interact properly, because a member of Codex, which had different views about other considerations (e.g. health concerns of consumers) and in good faith abstained from blocking the adoption

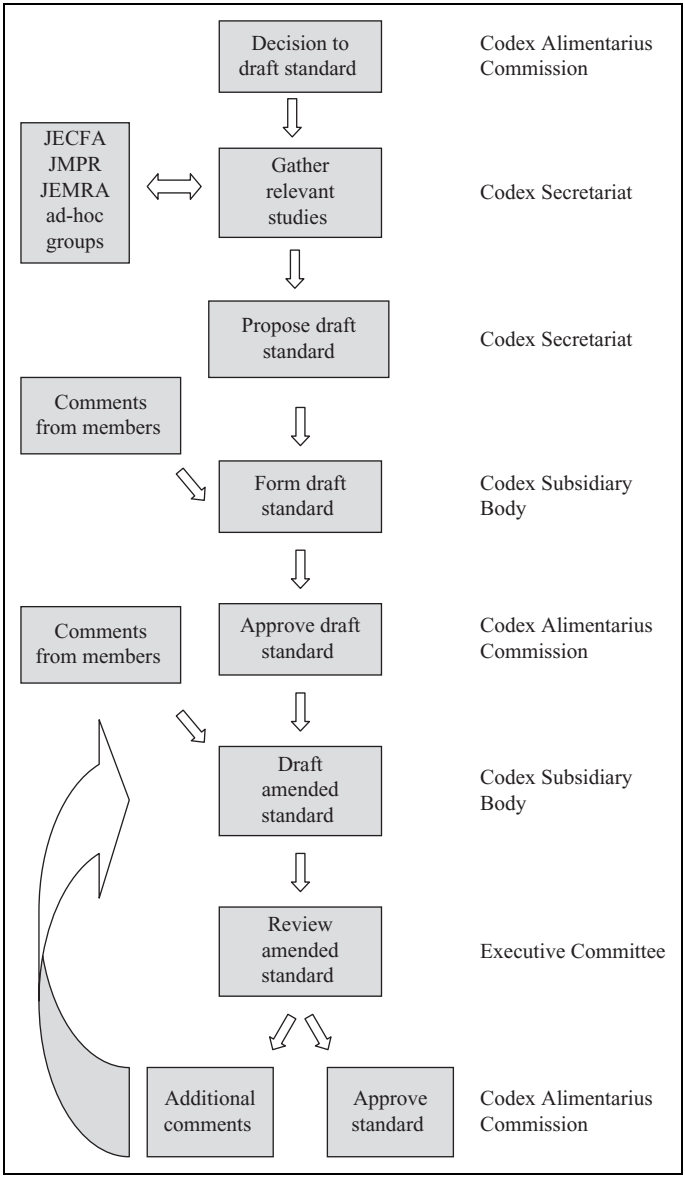

Figure 1. The Codex Standard-Setting Process
Source: Adapted from (FAO/WHO 2006a).

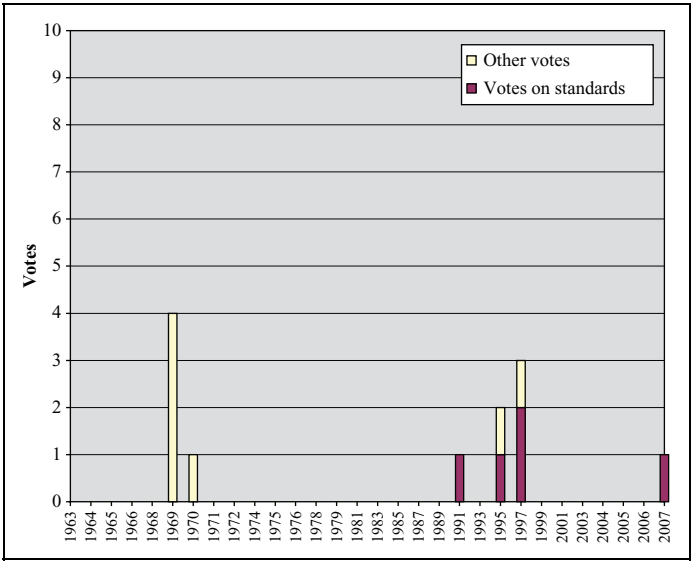

Figure 2. Voting in the Codex Alimentarius Commission

> of a Codex standard knowing in advance that in doing so it would not be required to follow the standard whose adoption it did not block, would later find itself to have an obligation to follow under the SPS Agreement. (WTO 1997)

In fact, the WTO Panel, as well as its Appellate Body, held that abstentions and even dissenting votes did not excuse a country from needing to justify its departure from an existing Codex standard.

The mid-1990s votes, and the *Beef Hormones* ruling, led to a questioning of the procedural rules within the Codex. In the 1999 Codex meeting, "India, supported by China, Malaysia, and other delegations expressed the view that, when decisions could not be reached by consensus and voting was required, a two-third majority should be introduced, in view of the importance of Codex texts as a reference in international trade" (CAC 1999, para. 61). The 2002 Codex evaluation also supported this strategy, noting that "the occasional use of simple majority voting of delegates present to adopt standards has led to some of the most controversial Codex decisions, given the narrow margins by which standards were passed" (Traill et al. 2002, para. 132). This is no doubt a reference to the 1995 Codex standards for five of the six hormones in the *EC-Hormones* case, which passed 33-29 with seven countries abstaining (WTO 1997). However, as we will

see, the institution has avoided formal reform and has instead moved to shore up consensus procedures.

Stabilizing Consensus

After passage of the SPS agreement, and the rise in frequency of voting, a number of scholars predicted that voting would play an increasingly important role in the newly "politicized" organization (e.g., Stewart and Johanson 1998; Motaal 2004). However, the data support no such conclusion: rather, there was a blip of voting around 1995, and then a retrenchment back to consensus outcomes (see figure 2).[11]

The Codex has actively mobilized efforts to prevent votes from occurring. In 1997, following a particularly contentious vote on the milk hormone, BST, the Commission tasked its Committee on General Principles with improving procedures to obtain consensus (CAC 1997, para. 125; Jukes 2000). This process led in 1999 to a decision to amend the Codex Rules of Procedure by adding rule X.2: "The Commission shall make every effort to reach agreement on the adoption or amendment of standards by consensus. Decisions to adopt or amend standards may be taken by voting only if such efforts to reach consensus have failed" (CAC 1999, 97). Years of additional discussion led to the 2003 general decision entitled *Measures to Facilitate Consensus* (CAC 2003, 123-4). This decision, now part of the procedural manual, recommends *inter alia* "[r]efraining from submitting proposals ... where the scientific basis is not well established on current data and, where necessary, carry out further studies in order to clarify controversial issues;" and that "matters should not be passed on to the Commission until such time as consensus has been achieved at the technical level." This decision highlights the Codex's attempt to mobilize adherence to consensus and understanding that "technical consensus" is central to political consensus. That these attempts to avoid voting are now taken quite seriously is illustrated by the fact that the draft residue limit for BST has been held at the final stage of the process since 1997, so as to avoid bringing it before the committee, where it would inevitably result in a vote.

Although the concept of consensus clearly does legitimizing political work on its own, the related idea that Codex standards flow rationally from universally accepted scientific knowledge is useful for both the Codex and the WTO. The instrumentality of the Codex is perceived to depend on its ability to produce convergence toward credible and authoritative standards that are "scientifically sound." Convergence validates the trust given to it

by the trading regime and reinforces its theory of food regulation as a technocratic practice, guided by universal reason.

Thus, the work to re-establish consensus decision making goes hand-in-glove with its post-WTO self-presentation as, above all, a *scientific* organization. The 2006 Third Edition of *Understanding the Codex Alimentarius*, an explanatory document targeting the public, states that the "carefully crafted Statutes and Rules of Procedure ensure that [the Codex] pursues its clearly defined objectives in a disciplined, dispassionate, and scientific way" (FAO/WHO 2006c, 13) and that "Codex standards are considered scientifically justified and are accepted as the benchmarks against which national measures and regulations are evaluated" (FAO/WHO 2006c, 31). Achieving consensus serves to demarcate the Codex as an expert agency, which in turn helps legitimate its newfound regulatory power.

The recent and anomalous vote on Emmental Cheese labeling in 2007 illustrates the weight put on consensus in the current Codex. This vote, the first on a standard in a decade, occurred when Switzerland refused a proposal by the Chair to simply note its opposition to the proposed standard and instead refused to allow the standard to go forward by consensus. According to the Codex procedures, in such a situation, the dissenting party must make a counterproposal. If this counterproposal is seconded, a vote ensues between the original proposal of the Chair and the counterproposal. After Switzerland made its counterproposal to send the proposed standard back to the relevant subcommittee for further discussion, a tense few minutes ensued, during which it did not seem that any party was going to second the counterproposal. Finally, the delegation of Jamaica seconded the proposal, sending the issue to a vote.[13] Remarkably, in spite of delegations' reluctance to second the issue, twenty-three members, or quarter of the voting countries voted along with Switzerland. Thus, even when standards pass by consensus, there are likely to be many members who would vote against it if a vote were to occur, but who elect not to in order to maintain the norm of consensus.

The vote was widely regarded as a black mark on the meeting. After the fact, many delegates expressed their displeasure that the vote had occurred, calling it a "negotiating failure." More than one delegate referred to what they thought would be the coming political fallout in this and other fora resulting from the vote.

Voting and Consensus in Science Advisory Bodies

The expert committees providing science advice to the Codex have also reconsidered the role of voting and consensus.[14] These bodies produce

the reports that the Secretariat gathers at the request of the Codex subcommittees (see figure 1). The reports combine exposure pathway and intake data with health and toxicological data to recommend amounts of substances that can be ingested daily over a lifetime without appreciable risk. This process frequently involves evaluating a set of previous studies and summarizing findings for the committee. With much agreeing evidence, this process may not be particularly controversial. When the evidence is mixed, the advisory body is in a more difficult position. Disagreement among scientists on these committees has generally been dealt with by simply reporting the disagreement. However, in the wake of the *Beef Hormones* case, explicit procedures for *resolving*, as opposed to reporting, this type of disagreement began to surface.

Each assessment that comes out of an advisory body represents an agreement on the part of the scientists writing the report. In the event of disagreement between these scientists, the Joint FAO/WHO Workshop on the Provision of Scientific Advice to Codex and Member Countries suggests that "[v]oting could be used where consensus cannot be reached. Meetings should strive for consensus wherever possible, but where consensus cannot be achieved, this should be documented" (FAO/WHO 2004, 21). This type of disagreement is inappropriate to represent with error bars and uncertainty intervals. If a single finding must emerge from such disagreement, it must instead be settled by interpersonal decision-making procedures. Requiring different degrees of majority or consensus introduces an important element of *democratic process* to what is ostensibly legitimated as an expert activity (Guston 2006). This suggested push toward formal voting procedures on expert bodies is an illustration of how changes in global trade law engendered changes in the practice of international science advising.

Perhaps more interesting has been the science advisory bodies' push back against this suggestion. As far as we can determine, no formal votes have taken place in the Codex expert bodies. At the sixty-fifth meeting of the JECFA, a safety evaluation of flavoring agents took place. During this evaluation, an irresolvable difference of expert opinion occurred, and after much failed attempt to reach consensus, the chair asked for a show of hands of who was not in agreement. The minority opinion of two scientists was recorded in the report. When asked about this event, a member of the JECFA secretariat said that this had not been a vote, and that the JECFA was not a voting body, insisting: "you cannot vote in science; you can only disagree."[15] Within the ethos of the Codex advising bodies, voting is perceived to undercut its scientific authority.

Representation on Expert Committees

These procedures to determine the content of the reports that Codex committees use to draft standards obviously heighten the importance of committee composition. Who is being chosen and how have become critical questions, just as they have in national contexts (Jasanoff 1990). But issues of political representation are playing out in different ways at the global level.

The major Codex science advisory bodies are joint expert committees of the FAO and WHO. Experts are selected by the Directors General of the FAO and WHO from rosters of experts within their respective organizations, with oversight from the executive board of their respective organizations.[16] The procedure for the selection of JECFA experts states that a balance between scientific expertise and other experience (particularly regulatory) is essential (FAO 2003). To be placed on a roster, an interested individual must submit an application in response to a current call for experts on a given issue. Other than travel expenses, time and resources used to gather the relevant studies, and draft summaries are not compensated. There is also an explicit requirement for a certain level of scientific expertise and experience.

Some scholars have noted that these policies on compensation and experience lower participation from developing country participants on advisory bodies (Boutrif 2003; Post 2005) and the issue recently emerged as a theme in a review of Codex science advising procedures. This was the so-called Joint FAO/WHO Consultative Process on the Provision of Scientific Advice—a multiyear process involving circulating papers in an e-forum, workshops, and the generation of reports containing recommendations that were regularly presented to the Codex. As part of this process, a "Meeting on Enhancing Developing Country Participation in Scientific Advice Activities" was convened in 2005, issuing its final recommendations to the 2007 Codex Committee meeting. Inclusiveness of minority scientific opinion and a diverse set of skills were core findings. The report also recommended that in the selection of participants, "due consideration should be given to geographical and socioeconomic balance, but not to the extent that it compromises scientific integrity" (FAO/WHO 2007, 11).

The emerging discourse about "inclusiveness" in expert committees has created an obvious tension with the Codex's concern with scientific credentials as the key criterion of committee membership.[17] The authority of advisory committees in the U.S. policy system, for instance, derives in part from their ability to claim the label "science" rather than "politics" (Jasanoff

1990). The notion that party-affiliation or geographical origin matters on these committees challenges their promotion as disinterested science.

Perhaps for this reason, official Codex statements have framed the geographical representation issue in ways that preserve the demarcation of advisory committees as a pure, scientific space. First, the goal of representation is presented as *credibility building*, rather than correcting science slanted to the interests of the North. The background discussion piece for an e-forum of the "Consultative Process on the Provision of Scientific Advice" states that the smaller proportion of experts from developing countries "contributes to the perception that the advice provided could be biased" (Gonzalez 2003, 1). The fact that the report worries only about the "perception" is telling: they do not actually worry about a departure from sound science due to a Northern bias but rather gaining the trust of developing countries.

In addition to credibility building, the need to reconcile representation with "scientific integrity" gives rise to a second framing: geographical representation as *capacity building*. When the benefits of greater participation are discussed in official reports and recommendations, they emphasize the creation of an "enabling environment" at home for new science and new science-based standards. For example, the report on the aforementioned "Meeting for Enhancing Developing Country Participation" recommends that a "practical booklet should be prepared by FAO/WHO and distributed that describes the importance of scientific advice as a tool toward increasing awareness of various member government agencies, organizations and institutes" (FAO/WHO 2006b, 16). Any reference to representation of developing countries on the committee is relegated to discussions about data availability in which insufficient data from developing countries may lead to their not being represented in scientific findings.

These framings of the representation issue highlight an important difference between science advising in international and domestic contexts. By shifting to talk of capacity building, a scripted and off-the-shelf discourse within the public international bureaucracy, the FAO/WHO advisory bodies try to accomplish what U.S. advisory committees were not able to do: call for ideological and political "balance" within advisory committees without undermining their epistemic authority. Because this body can argue that developing country participation brings scientific influence to national policymaking (an argument that does not make sense for political balance in the domestic setting), potentially conflicting parties are able to call for the same thing: greater participation. Thus, discourses of representation and sound science are made to converge rather than conflict, achieving the

reconstruction of science advisory committees as hybrid zones of knowledge making and political negotiation.

Conclusion

The emergence of the global food safety regime relied on a process of mutual legitimation across organizations and their differing sources of authority. The World Trade Organization invoked sound science and the Codex as a preexisting source of expertise that upheld it. But far from simply enrolling and empowering an existing expert organization, the WTO was instrumental in producing one. Furthermore, through a process of coproduction of both epistemic and legal authority, both the WTO and the Codex have given rise to an authoritative discourse of regulation and an attendant regulatory epistemology. The resulting standardized risk analysis within the Codex is a direct result of the ambitious goals set by SPS negotiators to rationalize and harmonize the regulation of consumer and environmental risk in the trading regime. Furthermore, the near-ubiquitous demand to base Codex standards on scientific risk analysis renders the regulation of food legible to a set of policymakers who seek to impose universally applicable standards in the interest of economic efficiency. These of course are not incorrect goals as such. But as scholarship by Scott (1998) and others has shown, large-scale rationalization projects may try to do too much: systems of standards may be in harmony with each other but discordant with the political reality within member states. Hence, it is critical to remain attentive to the ways particular accounts of science-for-regulation become naturalized at all levels of social organization. It is precisely this sort of attention that has helped produce a risk analysis framework that is far less rigid than first proposed.

We have also traced a narrative of knowledge regime stabilization, namely how the accretion of power at the Codex ushered in a phase of unsettlement around its working procedures, and its science advice. Validation of the Codex's newly vested authority necessitated new strategies of boundary work as it organized risk analysis into technical and policy phases and as it worked to re-establish procedures that seemed in accord with a technocratic ethos. Accordingly, the Codex has actively tried to re-establish consensus within its standard-setting procedures and avoid decision-forcing procedures in its science advice. Finally by framing calls for developing country participation in expert bodies as capacity building, Codex could retain its image as a technocratic rather than a political agency, productive of scientific convergence rather than disunity.

Like Latour's (1987) skeptic, if we go looking for the source of scientific legitimacy, we find that it is not readily localizable. It is spread out across a

network of actors, tools, and institutions. The WTO locates it within the Codex, the Codex looks to its expert advisory bodies, and the expert advisory bodies in turn look to the contingently defined scientific community. What we see is a process of nesting delegations of epistemic authority. At each step, the parent institution derives political legitimacy from a "nest" of experts, while the experts derive political authority from their parent institutions. As the work of these bodies takes on increasing power in the sphere of health and environment, expert consensus becomes harder to achieve, and so purer expert bodies are needed.

The move, however, toward democratic elements within Codex expert process signals the fact that such delegations have their pragmatic limits. Perhaps these new procedures harness the necessary sense of transparency, representation, and accountability within these hybrid bodies to enable them to do their political work. Considering both the power embedded within Codex functions and activities, the embrace of democratic elements should not be dismissed as inappropriate or out of place. To the contrary, they signal the critical importance of attending to the politics and procedural legitimacy within international knowledge institutions. We have in part been showing that these politics are taking on a particular character in global fora, where geopolitical divides are stark, where trade interests are strong, and where acceptable forms of science-for-regulation must somehow be negotiated.

As the political importance of the Codex has increased, these rules of procedure have come to the fore, becoming new sites of conflict in a struggle to define the rules for legitimate knowledge production within the WTO legal framework. These developments signify that Codex has achieved a sort of explicit status as a global governmental agency, a place of both politics and expertise that must balance efficiency with the other substantive values of a global community.

Notes

1. Interview with members of the SPS Secretariat, Geneva Switzerland, 2006-7.
2. The others are enumerated as the International Office of Epizootics and Secretariat of the International Plant Protection Convention (WTO 1994, Annex A(3)).
3. As a positive term, legitimacy of an institution describes a social fact—the actual acceptance of the authority by its subjects (Esty 2002). In a normative sense, the concept of institutional legitimacy is usually founded either upon a notion of just political process (e.g., elections for political representatives or deliberation), and/or a conception of rationality and technocratic efficacy (Livermore 2006). Technocratic legitimacy in a positive sense usually rests on the social authority of science and in a normative sense on the expected benefits of basing policy on

technical knowledge. Here, we are talking about political and technocratic legitimacy in the normative sense.

4. SPS interviews.
5. Of course, this belief in the pragmatic ability of "sound science" to settle disputes on contested regulatory questions was naive, as the ample STS work on regulation might have predicted; and these same "science-based" provisions have been litigated strenuously over the first decade of the agreement (Winickoff et al. 2005).
6. Standards for these four hormones, along with one other, were passed by vote in 1995 and then played a central role in the 1997 WTO dispute, *EC Measures Concerning Meat and Meat Products* (*Beef Hormones*).
7. On the negotiating history of the principles, see (Gerstetter and Maier 2005)
8. A 1999 draft of these principles and guidelines gave a working definition of the precautionary principle, and included the following as principle 7 "In case where scientific knowledge on the risks is insufficient, risk management decisions may be adopted on an interim basis as part of a precautionary approach." (CCFH 1999, 3)
9. The EC called upon this language in the *EC Beef Hormones* Panel case, claiming that "Members which had different views about other considerations (e.g. health concerns of consumers) could abstain from accepting the relevant standards." (WTO 1997, para. IV.86)
10. These data were compiled from the reports of the Commission. They exclude votes to modify the procedural manual, as these changes must be done via voting.
11. This material is based on one of the author's in-person observations in 2007.
12. As described above, the three standing bodies are the JECFA, JMPR, and JEMRA.
13. Personal interview–July, 2007.
14. For the FAO, these rules are given in Article VI of the FAO constitution: (FAO 2001). For the WHO, these rules are given in the "Regulations for Expert Advisory Panels and Committees" (WHO 2004, Sect. 31).
15. Codex explains in its public material that "those selected must be pre-eminent in their specialty, have the highest respect of their scientific peers, and be impartial and indisputably objective in their judgment." (FAO/WHO 2006c, 23) The issue of equity in representation across North and South is highly reminiscent of discussions within other global knowledge institutions, most obviously the IPCC (see e.g., Biermann 2002).

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