The Economics of Reducing Health Risk from Food

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1. Regulatory Targets and Regimes for Food Safety: A Comparison of North American and European Approaches

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Regulatory Targets and Regimes for Food Safety: A Comparison of North American and European Approaches

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To a greater extent than ever before, country-level regulation of food products is taking place in the context of international trade and international trading relationships. This context has several related implications for the economics of reducing health risk from food. First, countries must develop regulatory structures capable of assuring the quality of food products with domestic or diverse, worldwide origins. Second, countries must reconcile domestic demands for increased quality, with pressures from domestic producers and processors to make regulation efficient so they can maintain cost competitiveness in an international trade context. In this process, the regulatory experience of other countries may provide useful input into program design.

Third, and the major focus of this chapter, country-level regulation is under formal scrutiny as a potential nontariff barrier to international trade, particularly as tariff barriers have been progressively lowered under successive trade agreements. Thus country-level regulations are now subject to an additional judgement criterion related to their effect on the free flow of trade in food products. Overall, the international trade context for food regulation means that the economics of reducing health risk from food are more complicated and the benefit-cost calculations necessary to judge the efficacy of regulations more difficult to make. At the same time, careful economic evaluation of regulatory policies and private strategies to reduce risk has become more important to do.

Our focus is on the effect bilateral, trading bloc, and international trade agreements have and will have on the supply of food products with differing quality attributes, especially differing safety levels. In particular, we analyze and compare the varying approaches being taken to manage regulatory differences between trading partners, as a means of maintaining or improving food quality and as a means of controlling potential nontariff barriers to trade. The latter is often a difficult task, especially for safety-related regulations. As Kramer (1988: 1) points out "health and sanitary standards have gained such a secure and problematic position as nontariff barriers to trade precisely because of their ambivalent and non-transparent nature: they are one of the few types of trade barrier having any potential benefit to consumers." As groundwork for our chapter, we focus on a clear statement of the characteristics (attributes) of food products that government policies and private strategies seek to control. Targets are the quality levels they are trying to achieve. These targets can be set or influenced by different regulatory regimes (e.g., processing standards, information requirements).

Our central comparison of strategies to manage regulatory differences is between the approach of the European Union (EU) and North America under the North American Free Trade Agreement (NAFTA). (See Appendix 1.A for a Glossary of Acronyms.) The NAFTA approach is very similar to that of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT), which has established the new World Trade Organization (WTO). The comparison of European and North

American approaches is particularly useful as a starting point since the two trading blocs are relatively similar in terms of income levels and variances of member states (Worley et al. 1994). This analysis can form a base for study of trade relationships between trading blocs or countries with different income levels and possibly more diverse quality preferences.

Quality Targets: The Attribute Space for Food Products

Product quality is multidimensional or, to use Lancaster's (1966) language, is made up of a bundle of characteristics or attributes that determine the product's performance relative to its price. There is no definitive list of food attributes, since what are important characteristics will vary across circumstances and among individuals. The inability to be definitive should not, however, prevent a fairly clear delineation of the relevant attribute space. Surprisingly, such a delineation is often absent or implicitly assumed in discussions of food product quality, with some or a great deal of confusion being a common result.

We follow the economist's practice of using the term "quality" to refer to the overall mix of attributes possessed by a product. Several important subsets can then be identified within the overall set of attributes (see Table 1.1).[2] The first important subset is safety attributes including: foodborne pathogens, heavy metals, pesticide residues, food additives, naturally occurring toxins, and veterinary residues (Henson and Traill 1993). The class of regulations that deal with these safety attributes is generally referred to as sanitary and phytosanitary (SPS) regulations. The second set of attributes relates to the nutritional profile of the product and includes aspects such as calories, fat and cholesterol, sodium, carbohydrates and fiber, protein, vitamins, and minerals. We tentatively designate a third subset as value attributes. This is a diverse list that includes characteristics of the product itself that are of value to the consumer but are not food safety or nutrition attributes. Examples are purity (lack of nonhazardous contaminants), compositional integrity (i.e., lack of economic adulteration), size, appearance, taste, and convenience of preparation. The final subset is package attributes, which includes package materials, labeling, and other information provided.

As noted, this classification is neither definitive nor all inclusive but is intended to be useful in discussing food quality issues. Particular quality issues may embody attributes

TABLE 1.1 Quality Attribute Space for Food Products

Quality Attribute Subsets
1. Food Safety Attributes
Foodborne Pathogens
Heavy Metals
Pesticide Residues
Food Additives
Naturally Occurring Toxins
Veterinary Residues
2. Nutrition Attributes
Calories
Fat and Cholesterol
Sodium
Carbohydrates and Fiber
Protein
Vitamins
Minerals
3. Value Attributes
Purity
Compositional Integrity
Size
Appearance
Taste
Convenience of Preparation
4. Package Attributes
Package Materials
Labeling
Other Information Provided

from more than one attribute subset. For example, consumers who purchase organic produce may be concerned with food safety, nutritional, and value attributes. Several other aspects of growing, processing, and handling technology may similarly impact on multiple attributes (e.g., irradiation, animal welfare).

Our classification swims against the regulatory tide but we think it important to do so. In regulatory circles, "quality" is used narrowly to refer to non-safety related attributes of food products and, often, to issues of purity, with "safety" being distinguished as separate from quality (Hooker and Caswell 1995).[3] The result is a piecemeal and often confusing approach to food quality regulation.

Sorting Out Regulatory Regimes

Quality targets are met by quality assurance programs carried out by food producers, processors, distributors, and consumers. The target levels and the means of achieving them may be set or influenced by government regulatory requirements. Ideally, such regulatory requirements respond to and attempt to correct market failures and pass benefit-cost tests of desirability.

In the context of international trade and trading relationships, as well as on the domestic level, a clear delineation of regulatory strategies, or regimes, facilitates discussion. Here, too, there is no definitive list or approach. A common distinction is between regulatory regimes that focus on process or product performance standards. Further distinctions include input standards, information requirements, and pecuniary measures (e.g., taxes or subsidies) (Henson and Traill 1993). Following the product through to the consumer, regulations may also target conditions of sale (e.g., temperature of refrigerated-display cabinets) or services at the point of sale and conditions of use (e.g., safe handling of products by final user) (Foote 1984). Excluding pecuniary measures and following the product through the chain of production and distribution, the set of regulatory regimes is shown in Table 1.2.

TABLE 1.2 Regulatory Regimes for Food Products

Regulatory Regimes
1. Input Standards
2. Process Standards
3. Product Performance Standards
4. Information Requirements
5. Conditions of Sale or Services Requirements
6. Conditions of Use Requirements

Putting together the attribute space (regulatory targets) of Table 1.1 and the set of regulatory regimes of Table 1.2 yields a matrix of regulatory targets and regimes (Table 1.3). While some cells do not represent viable target/regime combinations, the matrix does describe the broad array of combinations available to regulators on the local, country, trading bloc, and international levels.

In the international context, a third dimension is added to Table 1.3 representing the management or lack of management of differences between country-level regulatory policies. Two major questions arise. First is the legitimacy of the country-level regulation. In other words, does the national government have a legitimate interest in regulating a particular target attribute and is the regulatory regime it has chosen appropriate for the achievement of its goal? In the absence of trading bloc and international trade agreements this question does not arise because the country is the ultimate arbiter of its own interests. Under several trade agreements discussed in detail below, international bodies are beginning to play a more important role as arbiter, judging whether regulations are legitimate or constitute unjustified nontariff barriers to trade. This question is also a central one between states,

TABLE 1.3 Regulatory Targets and Regimes Matrix

Regulatory Targets	Regulatory Regimes					
	Input Standards	Process Standards	Product Performance Standards	Information Requirements	Conditions of Sale or Services Requirements	Conditions of Use Requirements
Food Safety Attributes						
Nutrition Attributes						
Value Attributes						
Package Attributes						

provinces, or other sub-groupings in countries with federal systems (Foote 1984, Caswell and Kleinschmit 1993). It has been addressed in its federal and international contexts by a wide variety of authors (e.g., Kinsey 1993, Swinbank 1994b, Temel and Phumpiu 1994). This question hinges on the identification of legitimate regulatory actions, which suggests a heavy reliance on sophisticated benefit-cost analysis.

The second major question that arises in the international context is how differences in regulation, and specifically differences in justified regulation, will be managed so as to facilitate trade. We refer to this management process as regulatory rapprochement. Answers to the management question and differences in European and North American approaches to it are the focus of the remainder of the chapter.

Methods of Regulatory Rapprochement

Barriers to trade posed by tariffs have been steadily declining under evolving international trade relationships. The recently completed Uruguay Round of GATT, for example, continues this process by reducing tariff levels on agri-food products and initiating tariffication of some nontariff barriers to trade. In this setting, concern has focused on the potential for an opening of the floodgates of other types of nontariff barriers to trade (NTBT). To keep the gates closed, trade agreements and trading blocs have turned to adoption of provisions, such as those in the GATT/WTO agreement on sanitary and phytosanitary (SPS) regulations,[4] that are a basis for closely monitoring such NTBT to ensure that the gains from reduced tariffs are not eroded. These provisions also place a strong emphasis on increasing the openness and transparency of domestic-level regulations (Hooker and Caswell 1995).

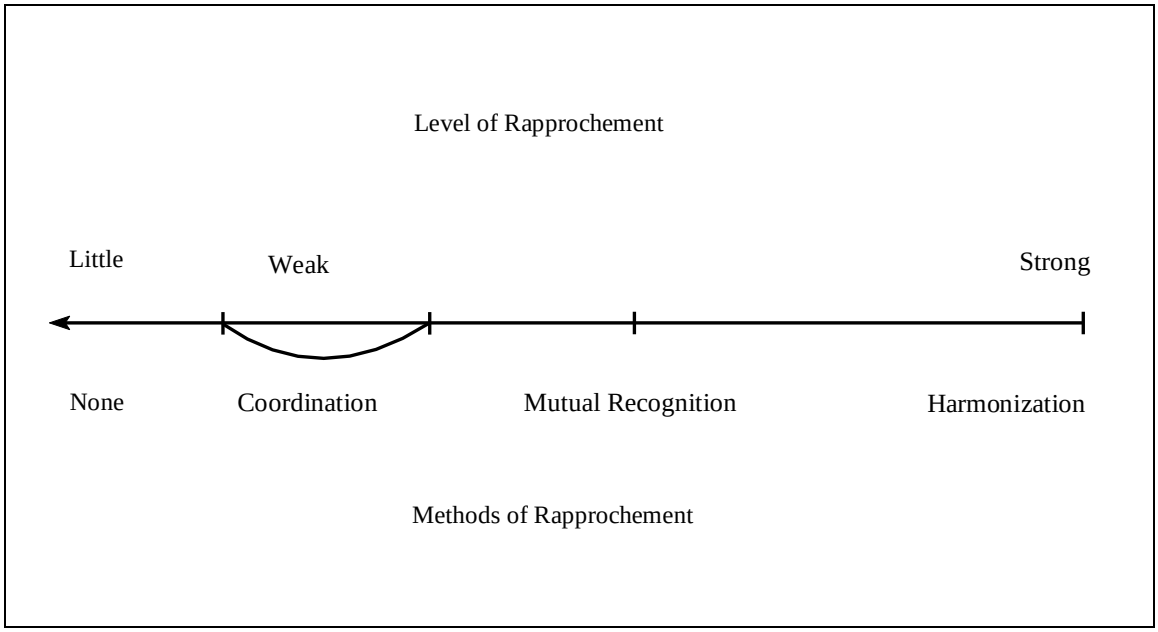
A concerted, cooperative effort to address NTBT arising from country-level regulation requires coordinated activity, which we term regulatory rapprochement. Strategies for rapprochement can be grouped into three categories (Jacobs 1994):

- ***Harmonization***: standardization of regulations in identical form.
- ***Mutual Recognition***: acceptance of regulatory diversity as meeting common goals (sometimes called reciprocity (Canada-U.S. Free Trade Agreement) or equivalency (some GATT agreements)).
- ***Coordination***: gradual narrowing of relevant differences between regulatory systems, often based on voluntary international codes of practice (sometimes called alignment).

It is useful to consider the spectrum of such strategies, as presented in Figure 1.1. The continuum begins with no rapprochement; moves to coordination, which is a broad range of weak forms of rapprochement; then to mutual recognition; and finally to the strongest level of rapprochement, harmonization.

Harmonization has most often been applied via minimum input, process, or product performance standards for particular food attributes. It can be applied across the full attribute space for these products. Mutual recognition involves agreement among a group of countries that a good legally produced within the bloc will be legal for sale throughout the bloc regardless of whether it meets the host country's domestic standards. It has most often been applied to value attributes because countries frequently do not like to give up control over food safety attributes (see discussion below), although it may be applied across the attribute space. Coordination covers a wide variety of efforts to align policy through consultations, adoption of voluntary standards, and other means. It too may be applied across the attribute space. A total lack of rapprochement is possible, but increasingly rare as international trading relationships take on growing importance for countries.

FIGURE 1.1 A Rapprochement Spectrum



It should be noted that a broad range of rapprochement vehicles exist outside the framework of particular trading bloc or international trade agreements. For example, bilateral Memoranda of Understanding (MOUs) are frequently used to facilitate trade by managing regulatory differences between countries. These may be a form of mutual recognition when they rely on the notion of equivalency of regulatory outcomes between the countries and facilitate two-way (intra-industry) trade. They may also simply be a form of coordination, as where trade is mostly one-way. Such management efforts may be applied across both dimensions of the matrix presented in Table 1.3. Private certification programs, such as ISO 9000, add another layer to the picture of quality control management efforts worldwide.

European Union's Rapprochement Regime

The European approach to regulatory rapprochement has been dynamic, evolving through the era of the European Community to the current European Union. Early attempts at harmonization quickly bogged down and the prospect of massive food law harmonization did not materialize (see, e.g., Club de Bruxelles 1994 for a discussion of the evolution of EU policy towards food safety). Instead, the EU has developed a dual form of rapprochement, generally applying harmonization to a limited range of food safety attributes and using mutual recognition for a broader range of the remaining food attributes, particularly for value attributes (Swinbank 1994b).

This rapprochement specialization is based on Articles 30 and 36 of the 1957 EC Treaty of Rome. Under Article 30, all quantitative restrictions, and other measures having effects equivalent to such restrictions, were prohibited between member states (Swinbank 1993). However, Article 36 contained an exemption allowing member states to impose trade impeding country-level regulations in the interests of public health (provided that such applications do not constitute "excessive" measures).

An important case that elucidated how these principles would be implemented for food products, the *Cassis de Dijon* case, centered on a German ban of a French-made black currant liquor because its alcohol content was too low to meet the German standard for liquors. Note that this is a performance standard for a value attribute of the product. In its ruling, the European Court concluded that a less severe regulatory regime, required information labeling of country of origin and alcohol content, would suffice to prevent the duping of German consumers, the rationale on which the ban was based (Swinbank 1994b). Thus the practice of mutual recognition for value attributes (also known as quality attributes) was established. It should be noted though that such rapprochement does not directly alter the domestic laws of the member states. Thus Germany in this example can still enforce minimum alcohol content standards for domestically-produced liquor. Anomalies caused by mutual recognition, however, do in some cases generate incentives to modify domestic laws.

Harmonization efforts have been applied to important food safety attributes in order to facilitate trade that might be hampered because Article 36 allows divergent safety regulation, as long as it is not excessive. These efforts have taken the form of a series of directives issued by the European Commission to member states, usually in the form of minimum process and product safety standards. As Swinbank contends (1994b), the dual rapprochement approach is still far from creating a single European market. He notes it results in product characteristics being determined by location of production, providing the example of different targets (food safety, nutrition, and value attributes) and standards (input, process) for margarine over 11 EU states. However, while falling short of a single market, the European Union gets closer to that ideal than any other grouping in the world.

The dual application of harmonization and mutual recognition for, respectively, food safety and non-safety attributes (such as value attributes), has strategic implications for firms operating in countries within and outside trading blocs. Swinbank (1993) points out that for non-safety attributes handled through mutual recognition there may be incentives to locate in the country within the bloc with the lowest standards. This choice gives the firm maximum flexibility in designing non-safety product attributes. However, Swinbank's argument may not be particularly powerful for firms selling branded, differentiated products since they have little incentive to lower quality. Further the search for lower standard countries to produce in is counterproductive for this type of firm, since future sales likely depend on quality improvement not degradation, even if degradation is accompanied by a lower price. Nevertheless, in some cases there may be an incentive to expand a product line by locating in a "low" standard country and then developing a new version of a brand or a whole new "low quality" line. In any case, the trade bloc format does generate incentives to locate production within the bloc to take advantage of mutual recognition and harmonization.

There is some debate over the wording of the case law regarding mutual recognition as it applies to the products of companies operating in countries that are not members of the trading bloc. Previously, products were required to be "legally produced *and* marketed in [a] member state" before they could claim access to all other EU states. However recent clarifications by the European Commission (not the European Court) have effectively "decoupled" this requirement to "produced *or* marketed" (Swinbank 1994b). This could have dramatic implications for third-party trades (see Swinbank 1994a for a detailed discussion). However, to date there are no cases testing this principle before the European Court, which may indicate that the issue is not viewed as important or that no firm is willing to undertake the expense (in time and money) of bringing a case they may lose. We believe this issue is important because it highlights the question of what defines an EU product. For example, how much, if any, additional processing or value adding is required to qualify a third-country product for free circulation after entry into a member country? Similar definitional problems are being faced by other trading blocs.

The continued growth of the EU, now to 15 members with the potential of many more to the East, may complicate the dynamics of rapprochement considerably (see, e.g., the discussion of the Europe Agreements in Club de Bruxelles 1994). Clearly rapprochement works most smoothly among states with

highly similar cultural, political, and economic characteristics and this close similarity is strained by addition of new countries.[5] Further, the existence of pan-EU brands, with strong reputational incentives to maintain quality levels, yet no real pan-EU retailing structure, is evidence of more complex interactions.

The Enforcement/Incentive Problem

At least two key enforcement/incentive problems are posed by use of rapprochement strategies to facilitate international trade, even after harmonized standards are in place or mutual recognition of products is accepted. First is the problem of verifying whether exporting countries are adequately enforcing their standards. Consider the issue of mutual recognition, for example. Which state should be responsible for validating that a good produced in one member state, and then sold in another, meets the minimum standards of the source country? Clearly, the source country has primary responsibility but the importing country may desire or feel a need to verify whether it is doing an adequate job, leading to the awkward situation of one country enforcing the rules of another (Swinbank 1994b). In the case of harmonization, how can one country be sure that all other member states are complying with harmonization directives, that the regulations have an identical or nearly identical effect, or that their efforts are equally efficient? Thus, when enforcement continues to occur on the country-level it results in on-going difficulties in the operation of harmonization and mutual recognition efforts.

Private certification systems can play important complementary or even substitutive roles to country-level regulation in the international trade context. For example, the International Organization for Standardization (ISO) has grown to be a truly global certification body, with agents worldwide. Thus the organization, "once feared as part of 'Fortress Europe,' is now viewed as a marketing opportunity by firms" (Junker 1995). Such systems can be adopted as a source of viable third-party certifications that may backup or even replace government regulation of some quality attributes, most notably value attributes. This allows bodies like the Codex Alimentarius Commission to focus on a smaller number of key regulatory issues.

A second major enforcement/incentive problem relates to the communication of product quality attributes to consumers. Rapprochement efforts such as mutual recognition result in a broader array of quality levels or combinations being available to consumers. Consumer protection requires that consumers have sufficient information to make informed choices about the quality/price profiles they are offered. This in turn may require the use of increased information requirements by governments. There may also be an increasingly important role for private certification of food products that would carry through to the consumer level with labeling, although systems such as ISO 9000 are not currently oriented to providing this type of service. Instead, they focus on company-to-company quality assurance and act as an important indicator of company effort, for example in demonstrating due diligence as required under the United Kingdom's 1990 Food Safety Act.

Comparison of EU and NAFTA Rapprochement Regimes

There have been several stages of trade agreements in North America, starting with minor bilateral agreements. These led to the 1988 signing of the Canadian-U.S. Free Trade Agreement (CUSFTA), and, most recently, to the North American Free Trade Agreement (NAFTA) between Canada, the U.S., and Mexico, which came into full force in 1994. NAFTA includes a progressive removal of virtually all tariffs on agri-food goods between the three countries within 15 years (for a discussion of the tariff removal timetable for various sectors see van Duren et al. 1994). At its signing, the agreement was the first to link developed and developing countries, which necessitated side agreements to cover contentious issues such as the environment. However, Mexico entered the OECD in 1994, becoming its first new

member in over 20 years, a signal of a shift toward developed country status. There still exists a great disparity in per capita incomes between, most markedly, Mexico and the U.S., with one estimate giving a ratio of 1:8 (van Duren et al. 1994).

NAFTA, unlike the European Union, is not intended to create an economic community. In its treatment of nontariff barriers to trade arising from food safety regulation, NAFTA is similar to the new WTO agreement, since its language on SPS standards (contained in Chapter 7) was based on the then draft GATT regulations. Generally this language allows for "formulation and administration of regulations and standards" by member countries (van Duren et al. 1994). This includes the right to prohibit imports from another NAFTA country provided such restrictions are based on appropriate science and risk assessment processes (see Article 715).

A major goal of NAFTA is to prevent discrimination and creation of nontariff barriers to trade based on unjustified safety regulation. Temel and Phumpiu (1994) characterize this effort with a model of sequential application of a scientific test to a particular SPS regulation and then a policy test. The regulation may be justified or unjustified on a scientific basis, while the policy may be legitimate or illegitimate. Thus controversy can arise if there is no scientific consensus, for example for reasons of risk measurement, or when the legitimacy of the policy is questioned.

To avoid as many disputes as possible on scientific grounds, both NAFTA and WTO advocate the use, where possible, of international standards issued under the Codex Alimentarius Commission (Codex), a combined United Nations WHO-FAO organization established in 1962. This food code was designed to ease the growing strain of the interdependence countries faced due to increasing food trade. It was intended to serve as a global food treaty, protecting and promoting SPS standards and nutritional quality, for all raw and processed foods. Codex currently has 150 members covering 97 percent of the world population. The Codex goal is an equivalency of the *effect* of regulations—not the regulations themselves. This allows greater flexibility to countries based on arguing differing needs and risk preferences, and also potentially leaves a door open to using safety regulation as a nontariff barrier to trade.

Compared to the European Union's use of strong forms of regulatory rapprochement, NAFTA primarily employs the weakest form, coordination. The form of the SPS provisions, for example, allows challenge to country-level regulations but no mechanism strongly to encourage regulatory cooperation. The efficacy of the strong recommendation to use common Codex or other international standards as a basis for country-level regulation is untried and is likely to be a long-run phenomenon if it occurs. The lack of a mutual recognition mechanism for non-safety attributes, for example value attributes, means higher nontariff barriers between NAFTA countries than between EU countries.

A major concern about food quality regulations, and a reason that closer harmonization or mutual recognition may be desirable, are their hit-and-run nature. As regulatory (and enforcement) regimes, they are relatively quick and easy to enact or enforce. They may be responsive to pressure for establishment of protective measures from domestic industry interest groups. It remains to be seen how much discipline of food safety regulation will result from the NAFTA requirement that country-level SPS regulations be science based, since disagreement may exist on best science and in country-level risk preferences.

As an example of potential barriers, consider recent concerns over the final format of Mexican food labeling requirements now under development. As a packaging regulatory regime, questions arose as to whether dual-language stickers would be allowed and whether stickers containing the required information had to be applied prior to importation into Mexico or could be applied later (*Food Institute Report*, April 24, 1995). Under NAFTA's weak form of rapprochement (loose coordination), each of the 3 member states have pursued near independent updates of their information requirements, especially as they relate to nutrition attributes. This has led to tension and concerns by producers about the costs of complying with differing regulations and suggestions that some of the new rules may be actionable under WTO as nontariff barriers to trade.

A further difference between NAFTA and EU is important in the context of consideration of regulatory rapprochement. NAFTA is a free trade agreement and the EU is a customs union (see Appendix 1.B for definitions of each).[6] Relative to non-member countries, a customs union has a single, common tariff, whereas in the weaker free trade arrangement member states maintain independent tariffs for third parties.[7] Thus free trade agreements require tracking of imported products for tariff purposes, in addition to any tracking needs related to regulatory purposes. If this ability is lacking then a third party could enter the bloc through the lowest tariff country and then enter the other member states without paying additional tariffs. This difference can also relate to enforcement options. The removal of border controls within the EU under the Single Europe Act prevents documentation checks at crossings. These checks may still be made under NAFTA.

Rules of origin for products are therefore an essential aspect of free trade agreements and their operation presents interesting insights into how intractable this problem can be. The origin problem will become more prominent as closer forms of regulatory rapprochement are developed among trading blocs. (Recall the discussion of the "produced *and/or* marketed" issue in the EU section above.) Attempts to solve the origins problem were made in the Kyoto Convention of the Customs Cooperation Council in 1974. The EU adopted these rules in 1977 but the U.S. failed to accept the rules of origin section of the Convention. Neither NAFTA nor the WTO provides definitive guidance on how a country, or bloc, should set its rules of origin. However, two tests are widely applied, each with problems. First is the "substantial transformation" rule, which states that goods become a product of a country only if the level of processing performed in that country is sufficient to cause the product to be assigned a different classification number for tariff purposes than its input(s). However, there is no consistent level of detail for all products in all countries. Thus a large amount of processing of one product may not be sufficient to alter its tariff classification, whereas another product may undergo only a minimal transformation and be allowed to claim it is a "bloc-product," exempting it from internal tariffs (Jackson 1989). The alternative is a "value-added" measure that determines a critical percentage of increase in the value of the product during processing required for a firm to assign the most recent country to its product (e.g., the 35 percent rule of the U.S. under the Generalized System of Preferences).

Consider then the strategies of firms wishing to import to a customs union or free trade area. There is no tariff advantage to enter a particular custom union country, whereas there may be such advantages in a free trade area. The existence and level of regulatory rapprochement adds a further level of complication to this choice. If the bloc is governed by harmonization for product attributes of concern to the firm, there is no incentive to enter through any particular country based on regulatory considerations. However if a weaker form of rapprochement exists, there clearly may be advantages to entering the bloc through certain countries. If, for example, mutual recognition is in place, as with value attributes in the EU, then even within a customs union there may be incentives to enter via the country with the lowest standards (Swinbank 1994a). Further, rules of origin may also be strong enough to prompt the firm to import a semi-processed good into a low-standard country, make it consumer-ready, and gain mutual recognition for the product throughout the bloc.

Our point is that the weaker forms of regulatory rapprochement generate incentives for points of entry into the trade bloc (or for location of production facilities) similar to those relative to tariff shopping among countries in a free trade agreement. Both situations require close monitoring of product origin. The evolving nature of rules regarding origin is evidenced by the U.S. Customs Service's recent announcement of its intention to amend its interim rules governing rules of origin, especially for NAFTA countries (*Food Institute Report*, May 8, 1995). The announcement discusses the "substantial transformation" test, as well as the determination of how a product is classified based on where the product was "wholly obtained or produced" or what is its most significant input that "imparts the essential character" to the product.

Role and Impact of the World Trade Organization

The WTO treatment of food regulatory issues, as noted, closely parallels that of NAFTA. The SPS section of the agreement is particularly important because it sets worldwide principles for the control of food safety regulation as a nontariff barrier to trade. One important difference in implementation between NAFTA and WTO is that the latter includes institutional arrangements for binding arbitration of differences between countries based on safety regulation (van Duren et al. 1994). These arrangements include automatic adoption of rulings and the disallowing of unilateral action. Indeed the whole issue of dispute resolution panels was of paramount importance in the Uruguay Round. In fact, the first U.S.-initiated WTO complaint related to food was against South Korea over shelf-life rules for imported processed meats (*Food Institute Report*, May 8, 1995). This complaint was based on the U.S. view that there is no scientific basis due to local differences in distribution techniques for the reduction by South Korea of the maximum shelf-life for these products from 90 to 30 days. This case, settled before being considered by a WTO panel, is indicative of the challenges to national-level regulation that are likely to be brought forward under the WTO framework.

The major development to watch under WTO over the next 10 years is the overall impact of its provisions regarding food quality regulations on worldwide patterns of regulation and regulatory rapprochement. Will trade cases inspire changes in country-level regulations or more adoption of mutual recognition and harmonization strategies? If NAFTA does not inspire such changes for the closely interrelated countries of North America, how much change can be expected among the very diverse set of countries that make up the WTO?

HACCP Case Study

A prominent example of developing rapprochement of country-level food regulations is the widespread movement toward adoption of a Hazard Analysis Critical Control Point (HACCP) approach to assuring microbial food safety (Mortimore and Wallace 1994). Consistent sets of HACCP principles were adopted by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) in the United States in 1992 and by the Codex Alimentarius Commission in 1993. The adoption of HACCP highlights some key differences between European, North American, and WTO approaches to regulatory rapprochement.

The European approach corresponds most directly to harmonization, with the European Union promoting the concept of HACCP systems for assuring the hygiene of meat products in 1992 and for foodstuffs in 1993 (Club de Bruxelles 1994). While still in an implementation stage, these directives and associated guidelines when fully adopted by individual countries should result in a reasonably homogeneous level of food safety assurance.

The North American approach corresponds most directly to a weak form of coordination, with Canada and the United States pursuing HACCP plans in a parallel fashion. Canada's adoption is most advanced, while U.S. HACCP plans for seafood and meat and poultry (USDA, FSIS 1995) are at the proposal stage. While the parallel movement toward HACCP approaches is likely to facilitate the easing of regulatory differences between the adopting countries, neither mutual recognition nor harmonization is anticipated in the foreseeable future. For example, in its HACCP proposal for meat and poultry, the USDA Food Safety and Inspection Service anticipates relying on current procedures to review foreign countries' inspection systems to ensure their approaches to food safety are equal to that of the United States (USDA, FSIS 1995: 6830). The individual development of HACCP programs by the North American countries foretells continued regulatory differences between the trading partners.

The WTO approach to regulatory rapprochement is weaker still reflecting the vast differences in regulatory programs among its member countries. The WTO will encourage rapprochement by encouraging member countries to adopt the Codex HACCP standards but has no means of leveraging this adoption except if one country were to challenge another's food safety system as unscientific and an unjustified nontariff barrier to trade. Countries will have strong incentives to adopt HACCP approaches in order for their companies to compete effectively in international trade but convergence of regulatory approaches rests on that incentive alone (it may be a powerful incentive).

Clearly in the short run, the European approach will be most effective in facilitating trade and in limiting microbial food safety regulation as a nontariff barrier to trade. The North American and WTO approaches are at an earlier stage of development, resulting in a higher continuing potential for microbial regulations to generate nontariff barriers to trade. Of course, the key economic question is whether the benefits of the programs outweigh the costs, with the costs including any potential losses from trade being limited to some extent by the regulation.

Concluding Thoughts

The value of comparative studies of food quality regulations should be clear, given increased international trade in food and the movement to coordinate regulatory policies under recent trade agreements entered into by the U.S. (e.g., NAFTA and the Uruguay Round of GATT). Our premise is that if Winham (1992) is correct in predicting the eventual importance of mutual recognition as a regulatory rapprochement tool within the WTO and other multilateral trade agreements, much can be gained by analyzing how it has operated in the EU, which is further ahead in implementing it. The European Union is also further advanced in its use of harmonization for country-level regulation of food safety attributes. In the future, freer trade in food products will rely on closer coordination of food quality attribute targets and regulatory regimes.

Notes

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[2]Attributes may be stated in terms of characteristics (e.g., no pesticide residues) or in terms of the service they provide (e.g., lowers cancer risk). For an example of the latter approach see Kinsey 1993.

[3]See, e.g., the recent USDA, Food Safety and Inspection Service (FSIS), Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems; Proposed Rule.

[4]SPS regulations are measures intended to 1) protect animal or plant life or health within a territory from risks arising from the entry, establishment or spread of pests, diseases, disease carrying or causing organisms, 2) protect human or animal life or health within a territory from risks arising from additives, contaminants, toxins, or disease-causing organisms in foods, beverages, or feedstuffs, 3) protect human life or health within a territory from risks arising from diseases carried by animals, plants, or products thereof, or from entry, establishment or spread of pests, or 4) prevent or limit other damage within a territory from the entry, establishment, or spread of pests.

[5]Sheldon and von Witzke (1992) develop a theory centered on income as an important factor in deciding the standards of EU member states (and indeed any other similar trading zone member). Thus the states are likely to differ in their food safety standards due to their differing average per capita incomes. They modeled quality in a vertical product differentiation sense and generated three scenarios

of intra-EU trade: 1) trade between two countries with approximately equal incomes, each with two levels of quality standard; 2) trade between countries with single standards, but differing average incomes; and 3) differing incomes, with the trade increasing the market size, and thereby increasing the standard. Generally, the authors expected to see, after 1992 with the opening up of borders within the EU, improved safety standards, from the pressure of price competition and rationalization, thereby increasing welfare (with an individual country affect being dependent upon pre-1992 income). This is all dependent, however, upon "consumers in one EU country [being able to] verify standards set by another country" (Sheldon and von Witzke 1992). This may advocate a role for the European Commission, the EU organizational institution, to harmonize the reporting of member states' differing individual standards, thereby increasing the information available to consumers, and in some way validating the quality of that information (Hooker and Caswell 1995).

[6]Exemptions of customs unions and free trade agreements under the WTO rules are only made if they can be proven to provide "substantial advantages to the world" (Jackson 1989) and are thus *trade creating* not merely *trade diverting*.

[7]This issue can be complicated even further by considering multiple tariff scenarios. A differential rate can be set dependent upon whether the third party is a WTO signatory or not, thus for one product there may be as many as 3 tariff rates, one internal bloc (perhaps equal to zero), one for third party WTO members, and one for non-members, thus requiring specific rules of origin (Jackson 1989).

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Appendix 1.A

Glossary of Acronyms

Codex	-	Codex Alimentarius Commission (also CAC)
CUSFTA	-	Canadian-United States Free Trade Agreement
EU	-	European Union (formerly EEC/EC)
FAO	-	Food and Agriculture Organization
FSIS	-	Food Safety and Inspection Service
GATT	-	General Agreement on Tariffs and Trade
HACCP	-	Hazard Analysis Critical Control Point
ISO	-	International Organization for Standardization
MOU	-	Memorandum of Understanding
NACMCF	-	National Advisory Committee on Microbiological Criteria for Foods
NAFTA	-	North American Free Trade Agreement
NTBT	-	Nontariff Barriers to Trade
OECD	-	Organization for Economic Cooperation and Development
SPS	-	Sanitary and Phytosanitary
TBT	-	Technical Barriers to Trade
USDA	-	United States Department of Agriculture
WHO	-	World Health Organization
WTO	-	World Trade Organization

Appendix 1.B

Definitions of Customs Unions and Free Trade Agreements

Under the Most Favored Nation clause of Article XXIV (paragraph 8) of GATT we obtain a definition of a customs union which requires:

> "[The] substitution of a single customs territory for two or more customs territories, so that...duties and other restrictive regulations...are eliminated with respect to *substantially all* the trade between the constituent territories,...and, *substantially* the same duties and other regulations of commerce are applied by each of the members of the union to the trade of territories not included in the union."

The same section defines the weaker form of a free trade agreement as:

> "A group of two or more customs territories in which the duties and other restrictive regulations of commerce...are eliminated on *substantially all* the trade between the constituent territories in products originating in such territories."

Source: Both cited in Jackson 1989, emphasis added.