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Biotechnology Regulations and the WTO
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Executive Summary

This paper examines the regulation of trade in genetically modified organisms (GMOs) by the World Trade Organization (WTO). Despite rapid adoption of GMOs by a few exporters, many importers have developed relatively restrictive procedures for pre-market approval of GMOs, and are introducing mandatory labeling. While exporters have yet to seek a ruling from the WTO on these regulations, a trade dispute over GMOs is likely to occur before too long. Exporting countries will likely argue that importing countries' regulations are too restrictive, given existing scientific knowledge of the safety of current GM crops, and that labeling of GM foods is unnecessary due to the fact that they are typically similar to their conventional counterparts. In response, importing countries will likely argue that existing scientific knowledge about GMOs is insufficient, and that a precautionary approach to approval is appropriate. In addition, importers will claim that labeling is necessary due to the fact that they are not equivalent to their conventional counterparts, and consumers have a right to choose whether or not consume such foods, be it for religious, ethical or other reasons.

In the event a panel will have decide on whether GM and non-GM products are "like goods", whether adequate risk assessment was undertaken for any regulation introduced for health reasons, whether labels constitute the "least trade distorting" way of meeting legitimate objectives, and whether regulations imply discrimination among suppliers or in favor of domestic producers. Experience with the SPS and TBT Agreements has not been extensive enough to indicate how such a panel might rule. But one can also view the issue in broader trade policy terms, as a balance between market access obligations that need to be adjusted as domestic regulations on new technologies are developed.

A possible solution is for importing countries with tough GM regulation and mandatory labeling to offer reciprocal increases in market access for non-GM foods in compensation for any losses of market access for GM foods. There is a question though of whether such "rebalancing" is actually practical, and it would certainly add to the costs of dispute settlement in the WTO, but it may be the only viable solution in the long run if the WTO is not to be dragged in to evaluating social and ethical bases for regulation of biotechnology.

Keywords: Biotechnology, regulation, trade, WTO

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Introduction

Since the mid-1990s, there has been rapid adoption of genetically modified (GM) crops in a select group of agricultural exporting countries, including the US, Argentina, and Canada. In 2001, of the 130 million acres planted worldwide, 96 percent was planted in these three countries. The United States led the field at 68 percent of the global total of GM acres, with Argentina accounting for 22 percent, and Canada 6 percent (James, 2001). Consequently, exporters of GM crops in these three countries, and in the US in particular, have a significant interest in ensuring market access for both current and future generations of bio-engineered crops.

By contrast, the political and regulatory environment of many importing countries in Asia, the European Union (EU), and elsewhere, suggests that trade in GM products is unlikely to be accepted uncritically just because these three exporting countries have adopted these crops. During the past three years, the debate over genetically modified organisms (GMOs) has continued. Although it has undoubtedly been most intense, and most publicized, in the EU, culminating in June 1999 with the formal imposition of a moratorium on approval of additional transgenic crops, there have been widespread concerns in other countries over the safety and environmental impacts of such crops.

The objective of this paper is to address the interaction between the regulation of trade in products of agricultural biotechnology and the rules of the World Trade Organization (WTO). The paper breaks down into three sections. The first section describes the nature of alternative patterns of GMO regulation, focusing on the key differences in approaches to regulation, and how certain aspects of these regulations may result in a trade dispute. The second section discusses the nature of the WTO regulations that might form the basis for international trade disputes in the WTO arising from the differences in regulatory approaches. Third, given the evident potential for a trade dispute in this area, the question of whether the WTO is equipped to deal with such a dispute is examined.

GMO Domestic Regulations

In an earlier analysis, Nelson (2001) characterized national regulation of genetically modified organisms as a “patchwork”. Many countries have handed regulatory responsibility for agricultural biotechnology to multiple agencies that deal with agriculture, the environment, and food safety, and these agencies have then typically grafted regulations concerning agricultural biotechnology onto existing regulations relating to release of new varieties, use of pesticides, and marketing of food products. This patchwork, however, would not be in itself a necessary cause of international frictions over biotechnology regulation. The WTO does not concern itself with the domestic process of GMO regulation. It is only concerned with whether one specific aspect of GMO regulation, namely the import regulations, are trade distorting. However, the lack of international coordination of certain aspects of GMO regulation certainly adds to the likelihood of future trade disputes.¹

¹ The benefits and limits of coordination in food regulations are explored in Josling, Roberts and Orden (2001).

Countries typically employ one of two key approaches to GMO regulation, depending upon whether they base specific biotechnology rules on an *equivalence principle* or a *precautionary principle*.² The hallmark of the first approach is that it is *reactive* rather than *proactive*. Countries that use a reactive approach tend to base rules on consensus scientific information, regulate the product rather than the process, and use the non-biotechnology product as a point of comparison. Countries that favor the precautionary approach tend to pay more attention to heterodox scientific ideas, often regulate the process rather than the product, and prefer to make absolute judgments about health and environmental safety rather than compare with the non-GM product. Thus the key precepts in an “equivalence” paradigm are the use of scientific risk assessment, the concept of *substantial equivalence*, and the notion of a set of foods that are *generally regarded as safe*. The key concepts for countries adhering to the *precautionary principle* are that scientific understanding can change over time, vitiating current wisdom, that biotechnology products are inherently different (and therefore that substantial equivalence is a slippery concept), and that the fact that non-biotechnology foods are commonly regarded as safe without rigorous testing is no reason to exempt biotechnology products from strenuous efforts to protect the public and the environment. It is probable that international trade disputes will arise in large part due to the inevitable tension between equivalence-based regulations, and those that rest on the precautionary principle. This prospect explains why the attempts by the EU and others to have the precautionary principle enshrined in the WTO have met with such intransigence by the US and other GM exporters.

Not so obvious is the link between the type of regulatory approach taken and the need for mandatory labeling of GM products. The equivalence approach, based on an implied confidence in the scientific information available, tends to favor either no labeling or voluntary labeling of whatever characteristics the private sector wishes to claim if such attributes can be verified. This voluntary labeling is likely to be of a “negative claim” kind, that the product is GM-free.³ Mandatory labeling is only seen as necessary where clear health risks are envisaged. The precautionary paradigm tends to lead to mandatory “positive” labeling. The regulatory authorities are in effect giving an implied “warning” that the product is still “experimental” in that evidence has still to be fully assessed – and may not be for a number of years. The message is that “we don’t have any specific reason to ban this product but we think it is different enough to insist that it be identifiable by consumers.” The corollary of this implied message is that private decisions can reflect distinctions that the public authorities are reluctant to do. Such mandatory labeling runs the fine line between describing product characteristics and identifying process attributes. It also poses the most challenge for the WTO Technical Barriers to Trade (TBT) Agreement, as that covers most types of labeling regulation.

A broad description of the types of labeling regulations in use for selected countries for which information is readily available is presented in Table 1. It is clear from the table that the majority of countries either has implemented or is

² Patterson makes a similar distinction in comparing the approach of the US and the EU to biotechnology regulation (Patterson, 2000).

³ Of course, when desirable attributes are involved, the private sector will favor “positive claim” labels. Mandatory labels will then tend to be such as to ensure the truthfulness of claims.

considering implementing mandatory labeling of GM foods. The countries that have chosen to opt for voluntary labels are usually those that have also chosen to use the equivalence paradigm for regulation.⁴

Table 1: Country Groupings of GMO Regulations

	Regulatory Approach to Food Approval	Products Approved ^(a)	Labeling (Date effective) (% threshold)^(b)
COUNTRIES USING VOLUNTARY LABELING			
Argentina		Corn, cotton, and soybeans, ban on new approvals at present	Voluntary
Canada	Concept of substantial equivalence	Thirty-eight products approved	Voluntary guidelines (2001)
Hong Kong			Likely voluntary (2003) (5%)
Malaysia		Soybeans approved	Preference for no labeling
Singapore	Case-by-case		No scheme proposed
United States	Concept of substantial equivalence	Over forty products approved	Voluntary guidelines (1992, 2001)
COUNTRIES USING MANDATORY LABELING			
Australia	Concept of substantial equivalence		Mandatory (End of 2001) (1%)
Brazil		Soybean approval suspended ^(c)	Mandatory (December 31, 2001) (4%)
Chile			Mandatory (June 20, 2001) (1%)
Czech Republic	Procedures similar to EC Directives		Mandatory (May 10, 2000)
European Union	Concept of precautionary principle	Ten products approved	Mandatory (May 15, 1997) (1%)
Bulgaria	Procedures similar to EC Directives		Mandatory
Hungary	Procedures similar to EC Directives		Mandatory
Indonesia			Mandatory (January 2001)

⁴ Labels appear at first sight to be an obvious solution to GM trade problems. One might argue that, because GM foods have the characteristic of *credence* goods, the optimal solution is some sort of labeling, be it of GM foods or non-GM foods (Caswell, 2000). With labeling, informed consumers can maximize their utility, relative prices will reflect their choices, and the gains from trade will be maximized. Exporting countries, however, may argue that labeling will unfairly “stigmatize” GM foods, undermining the benefits of free trade. It is not always the case that labels are efficient if they give misleading information to consumers.

Japan		Twenty products approved	Mandatory (April 1, 2001) (5%)
Mexico	Cibiogem developing		Mandatory under discussion
New Zealand	Concept of substantial equivalence		Mandatory (End 2001) (1%)
Norway			Mandatory (July, 1997) (2%)
Philippines			Mandatory under discussion
Poland	Adopted EC Directives 90/219 and 90/220		Mandatory
Russia			Mandatory (some exemptions) (July 1, 2000)
Saudi Arabia	Proposed import ban		Mandatory (December 1, 2001) (1%)
Switzerland			Mandatory (March, 1995)
South Korea	Based on Biosafety Protocol		Mandatory under discussion, similar to Japan (July 12, 2001)
Thailand		Forty products approved	Mandatory (End 2001)

Source: Adapted from IATRC (2001), Phillips and McNeill (2000)

- (a) Products approved for commercial use, either as imports or for domestic use/planting and subsequent marketing
(b) The % threshold above which, a product has to be labeled as containing GM ingredients
(c) Prior to 1998, imports of all GM products into Brazil were prohibited. GM soybeans were subsequently approved for planting by the federal government, and later banned by a federal judge.

The description of the two competing regulatory paradigms gives a useful checklist of those features of national GMO regulatory regimes most likely to generate conflict in terms of the WTO Sanitary and Phytosanitary (SPS) and TBT Agreements. The next section indicates how countries are lining up with respect to the regulatory paradigm and the type of labeling regime.

Patterns of Regulation

The WTO conflict is likely to be between countries that employ the two regulatory paradigms described above. Before examining the nature of the conflict itself, it is useful to elaborate on the types of regulation that countries use and the main argumentation behind them.

Countries Using Substantial Equivalence, GRAS and Voluntary Labeling

The group of countries that embrace the “equivalence” paradigm consists of three major agricultural exporting countries, the United States, Canada, and Argentina, who have either a high level of development of agricultural

biotechnology and/or high rates of commercial adoption of GM crops, together with Malaysia, Singapore and Hong Kong. The dominance of the three exporters in the number of acres devoted to GM crops was noted earlier. But they also seem to be keen to continue the lead. The US and Canada account for nearly 70 percent of the 10,313 GMO field trials reported in the OECD's Field Trial Database (OECD, 2001), and also account for 63 of the 74 GM products listed in the OECD's Biotech Product Database of products that have either received or are in the process of receiving commercial approval (OECD, 2001). The US and Canada also have the earliest-developed GMO regulatory systems in place, and while they have been under public scrutiny over the past two years they have not been changed in any substantive way.

The regulatory framework in the US is based on the Coordinated Framework for Regulation of Biotechnology Products, published in the *Federal Register*, June 26, 1986. This framework established that biotechnology should be regulated through three existing agencies rather than a new, dedicated agency (Belson, 2000).⁵ The three agencies concerned are the APHIS, the EPA and the FDA.⁶

The FDA has been at the forefront of articulating the doctrine of *substantial equivalence* as a basis for regulation of GMOs. The issues of labeling and regulation of GM foods were first addressed by the FDA in 1992 (Korwek, 2000). Essentially, the FDA drew on the Federal Food, Drug, and Cosmetic (FD&C) Act, focusing on sections 403 (a) and 201 (n) (FDA, 1992). The first of these requires that food or food ingredients should be described by their common name, while the second requires that labeling of food should detail all facts that are "material", and determines the circumstances under which labeling can be either false or misleading. The concept of materiality relates to information about the attributes of food products, and the FDA has typically required labeling of foods with "material" information where that information relates to a health risk, or it substantiates quantitatively any claims made about nutrient content of the food product (FDA, 2001).

The FDA's 1992 position on the issue of mandatory labeling was always clear: labeling of GM foods was not to be required for products sold in the US. First, they took the position that recombinant DNA (rDNA) methods of plant development are not "material" information under the terms of sections 403(a) and 201(n) of the FD&C Act.

⁵ The tendency in other countries has been to consolidate food regulations under one agency. Although suggestions have been made in the US along these lines, opposition from the food industry has been enough to dissuade politicians from taking action. The recent threat of bio-terrorism, however, has rekindled efforts in the US to establish a single agency to regulate food safety.

⁶ USDA's Animal and Plant Health Inspection Service (APHIS) relied on the Federal Plant Pest Act to deal with GM plants, and now operates under the Federal Plant Protection Act of 2000, which replaced the earlier Act. It has regulations in place relating to the introduction of genetically engineered organisms in the US. Typically, APHIS is involved in regulating the small-scale field-testing of GM plants prior to their commercialization. The US Environmental Protection Agency (EPA) is responsible for regulating plants that are genetically engineered to express pesticides such as Bt corn. It operates under three federal statutes: the Federal Insecticide, Fungicide and Rodenticide Act (FIFR Act), the Federal Food, Drug, and Cosmetic Act (FD&C Act), and the Toxic Substances and Control Act. The US Food and Drug Administration (FDA) deals with the pre-market approval of GMOs and foods containing GM ingredients under the FD&C Act, and also provides guidelines on the labeling of GM foods.

Essentially, the FDA felt that crop development through genetic modification was simply an extension to the molecular level of traditional plant breeding methods. Second, the FDA established the principle that existing GM foods do not differ in any substantial way from those developed through traditional plant breeding methods. This principle of substantial equivalence, however, also establishes the circumstances under which the FDA would require labeling of a GM-food product: if the GM version of an existing food product is substantially different, if the GM version has very different nutritional properties, or if the GM food contains an allergen that would not normally be present in that food product. Therefore, there is no explicit “right to know” labeling requirement in the FD&C Act, except insofar as genetic modification could change food in the manner just suggested.⁷

GMO regulation in Canada is very similar to that in the US in terms of the involvement of multiple agencies, pre-market approval of products, and also the principles on which they base their approach to regulation and labeling. Food labeling in Canada is currently regulated under the Food and Drugs Act, and while legislation covering GM food labeling remains under development, government guidelines are based on a consensus that there should be mandatory labeling only if there is a food safety concern over a product. Voluntary *positive* labeling, and voluntary *negative* labeling are to be allowed, provided the relevant claims are factual, and neither misleading nor deceptive.⁸

The key to the US and Canadian approaches to regulation of GMOs is the principle of minimal oversight of food products that are *generally regarded as safe* (GRAS). Conventional food products are considered GRAS, and this is the standard by which GM foods are being judged. The approach recognizes that a zero tolerance for potentially hazardous ingredients in food would result in few foods ever being marketed. In addition, there are practical difficulties in conducting toxicological tests on whole foods as compared to pesticides and food additives. As a result, the concept of GRAS has been adopted as an integral part of the process of evaluating the safety of GM foods. The objective of such an approach is not to establish absolute safety, but to consider whether a GM food (ingredient) is as safe as its conventional counterpart. The focus is on identifying intended and unintended differences between the two types of food (ingredient), which are then analyzed in a pre-market safety assessment.

The regulatory approach adopted by the US and Canada is consistent with recommendations for assessing the safety of GMOs made by the OECD (1993), the World Health Organization (WHO)/Food and Agriculture Organization (FAO) (1995, 1996, 2000), and the Codex Alimentarius Commission (2001a).⁹ As noted by the WHO/FAO (2000),

⁷ See Thompson (2000a) for a discussion of labeling and ethical considerations.

⁸ A positive label might state, “product contains GM ingredients”, and a negative label might state, “product contains no GM ingredients”.

⁹ The Codex Alimentarius Commission (Codex) was established in 1962 to administer the Joint WHO/FAO Food Standards Program. This program has several functions: to protect consumer health, ensure fair trade practices involving food products, and to facilitate international coordination of food standards regulation (Buckingham, 2000; Mansour and Bennett, 2000). The role of Codex has become more significant since the WTO’s inception. Specifically, the Sanitary and Phytosanitary (SPS) Agreement, which concerns trade restrictions relating to human, plant, and animal health, explicitly specifies that any country using Codex standards is deemed WTO consistent (Buckingham, *op. cit.*; Josling and Patterson, 2001). While there are as yet no agreed standards on GM foods in

a good deal of the criticism aimed at the concept of substantial equivalence has been due to the mistaken view that it represents the conclusion rather than the beginning of the safety evaluation process for GMOs. The WHO/FAO emphasize that the concept is based on establishing both similarities and differences between a GM food and a *comparator* food that has a history of safe use. This starting point then guides the safety assessment of any key differences between the GM food and the comparator. Importantly, if a comparator does not exist, then the concept of substantial equivalence cannot be used to evaluate safety of the GMO.

Countries Using Precautionary Principle and Mandatory Labeling

The second group of countries includes those that employ mandatory labeling systems and in general adhere to a precautionary approach. This group includes some countries with relatively well-developed regulatory systems, such as the European Union (EU), Japan, Australia, and New Zealand; other countries that are either independently developing their own systems of regulation, such as Norway and Switzerland, or countries following the lead of the first sub-group such as Hungary, Poland, and South Korea. Countries in the first sub-group had already approved a number of GMOs during the 1990s, but adoption of such crops since that time has been very limited. For example, in 2000, Spain, Germany and France had small areas of Bt corn, and Australia a small area of Bt cotton (James, *op. cit.*). But they have also significantly revised their approaches to regulation in light of concerns expressed by their consuming publics. In addition, many other countries in both Eastern and Central Europe, and South East Asia, either have or are likely to implement similar regulatory systems.

Prior to 1990, the EU had no coordinated biotechnology policy (Josling and Patterson, 2001). The key pieces of EU legislation, European Council Directives 90/219/EEC and 90/220/EEC, were adopted on April 23, 1990. These directives were largely written by, Directorate General XI for Environment and Consumer Protection. Between 1992 and April 1998, under this system of regulation, the EU approved 10 GM products for commercial marketing, including varieties of both GM corn and soybeans.¹⁰ But even though the EU approved several GMOs under Directive 90/220, individual member countries such as Austria and Luxembourg chose to ban the import of a variety of Bt corn in February 1997, on the grounds that they had established new evidence of risk.

Codex, an Ad Hoc Intergovernmental Task Force is focusing on developing principles and guidance for risk analysis of foods derived from biotechnology (Codex Alimentarius Commission, 2001a), and a Committee on Labeling is establishing guidelines for the labeling of GM foods (Codex Alimentarius Commission, 2001b). There seems to be some agreement among Codex members about how to conduct safety assessment of GM foods, while there is considerably more disagreement over whether labeling of GM foods should be mandatory. The purpose of the Codex Alimentarius Commission's draft guidelines for labeling are only to "...set out a number of approaches and related information that could be used for labeling of food and food ingredients obtained through techniques of genetic modification/genetic engineering..." (Codex Alimentarius Commission, 2001b: 4).

¹⁰ Directive 90/219/EEC concerns the management of GMO research and development, covering containment and control, record keeping, emergency planning, and notification. Directive 90/220/EEC covers the deliberate release of GMOs, the main elements of the directive requiring notification of the release to the relevant authority in the Member State where the GMO would first be marketed. After review, the Member State could give consent to the marketing.

A third piece of legislation was adopted in January 1997, the Novel Foods Regulation, No. 258/97. This regulation established an approval procedure for novel foods and novel food ingredients, which are defined either as foods or food ingredients containing or consisting of GMOs, or foods and food ingredients produced from but not containing GMOs. In addition, the Novel Foods Regulation required both unprocessed GMOs and foods that may contain GMOs to be labeled, and that the labels must indicate whether it is no longer equivalent to the conventional version of that food. The labeling rules were subsequently refined such that food products containing at least one percent of GM corn or soybeans would have to be labeled as GM products.

In June 1999, the Council of the European Union formalized a moratorium on GMO approval by recommending to the European Commission an amendment to Directive 90/220/EEC. The provisions of the recommendation were for the EU to take a thoroughly *precautionary* approach to future approval of GMOs, that GMOs should not be placed on the market until it could be demonstrated that there is no adverse impact on human health and the environment, and that principles regarding traceability and labeling be applied. The *precautionary principle* had already been employed in the EU's approach to environmental policy (Perdikis, 2000), and moreover is enshrined in Articles 130 (2) and Article 174 of the EC Treaty (European Commission, 2000).¹¹

The final stages of the EU legislation are still being put into place. On February 14, 2001, the European Parliament voted in favor of a revised Directive 90/220/EEC, the Council of Ministers adopting it on February 15, 2001 (EU Parliament and Council, 2001). Along with legislative proposals on traceability and labeling of GMOs, the revised directive should see the eventual resumption of the process for EU approval of GMOs. But Austria, Denmark, France, Greece, Italy and Luxembourg have all stated they want the current moratorium to remain in force.¹² In addition, at a recent meeting of EU environment ministers, only Spain, the Netherlands and the United Kingdom showed any willingness to proceed with lifting the moratorium (Pomeroy, 2001).

¹¹ Article 174 states, "Community policy on the environment...shall be based on the precautionary principle and on the principles that preventive action should be taken..." The European Commission has issued an important communication with respect to its understanding of the precautionary principle (European Commission, *op.cit.*). In this, they describe the framework for science-based risk assessment, and lay out guidelines for implementing the principle in a transparent manner. Specifically, zero risk must not be aimed for; implementation should be non-discriminatory and consistent with measures taken in equivalent areas where the scientific data are available; cost/benefit analysis should be conducted; and any measures taken should be provisional pending new more reliable scientific data becoming available. The communication, however, is vague on what weight of evidence is required for triggering the principle, and how much evidence of safety has to be provided for a new technology to be approved.

¹² The European Commission has recently announced its proposal on rules for labeling and traceability of foods containing GMOs. The rules will require all foods and animal feed derived from GMOs to be labeled, and in the case of processed goods, records will have to be kept to allow GMOs to be traced back to the farm of origin. The proposed rules will also cover refined products such as vegetable oils, where the product will be labeled as having been derived from GMOs, even though the relevant rDNA is broken down during the refining process. Accidental traces of GMOs up to 1 percent will be allowed in foods and feed without the need for labeling, although this proposed provision is not receiving unanimous support among member countries.

The development of regulations in Japan is also an interesting case of how public concerns over the safety of GMOs have affected the regulatory process. Between 1992 and 1999, Japan approved 37 GM crops, including soybeans, corn, and canola. In early 2000, Japan announced that suppliers of GM foods must provide proof of their safety prior to sale on the market. So far, over 20 GM foods have been approved for use. As of April 2001, imports of foods containing GM ingredients that have not been approved will be banned. In addition, Japan has announced that, as of April 1, 2001, it will require the mandatory labeling and import notification for perishable and processed foods that are either genetically modified or contain GM ingredients. The draft of the regulation lists 24 different processed foods and ingredients, derived from corn and soybeans, which must be labeled if used as a major ingredient in a food product.¹³ Foods such as oils and other highly processed foods are exempt if they do not contain detectable levels of GMOs. As a result, Japan seems to have introduced even more rigorous mandatory labeling regulations than those currently adopted in the EU.

Finally, Australia and New Zealand are included in this sub-group because they have implemented regulations for the mandatory labeling of GM foods. It should be noted though that neither country refers to the precautionary principle in their regulatory language. Australia and New Zealand regulate food safety together through the Australia New Zealand Food Authority (ANZFA) and the Australia New Zealand Food Standards Council (ANZFS). The marketing of GMO foods is regulated through Standard A18 of the Australian Food Standards Code. This standard requires that a safety assessment, based on a scientific risk-based approach, be conducted on all foods produced with biotechnology.¹⁴

The ANZFA guidelines make a very clear reference to the concept of substantial equivalence and its application in food safety assessment, referring to the OECD principles (OECD, 1993). In that sense, the Australian and New Zealand regulations are very similar to those of Canada and the US, with similar principles in place for risk assessment (ANZFA, 2000). In contrast to Canada and the US, however, ANZSFC agreed to new mandatory labeling rules in July 2000. The new food standard requires the labeling of food and food ingredients where rDNA and/or novel protein is present in the food. It also requires labeling of food and ingredients where the food has altered characteristics. There are a number of exemptions to the requirement, including highly processed foods where rDNA and/or novel proteins have been removed through refining, food prepared at the point of sale, and any one ingredient in a food is allowed to contain up to one percent of GM material whose presence is unintended. Interestingly, ANZFA makes it very clear that it is implementing mandatory labeling not because of any safety issue, but rather to give consumers information so that they can make an informed choice if they have ethical, environmental, religious, or other reasons for avoiding GM foods (ANZFA, 2000).

¹³ The term “main ingredient” is defined to be the top three ingredients by weight, where each must weigh five percent or more of the food.

¹⁴ Standard A18 provides an exemption for those foods currently on the market if an application was accepted by ANZFA prior to April 30, 1999, the food is lawfully permitted in another country, and the ANZFS has not obtained evidence showing the food is a risk to public health.

There appears to be some movement in several importing countries toward adopting EU-like regulations on GMOs. Norway, Russia, and Switzerland have implemented GM regulations, including mandatory labeling rules, that are broadly consistent with EU regulations, and several Eastern and Central European countries such as Bulgaria, the Czech Republic, Hungary, and Poland have adopted regulations that are similar to those contained in the EC Directive 90/220. South Korea has implemented labeling regulations similar to those adopted in Japan.

Many developing countries have as yet only limited regulations in place. Indonesian regulations currently require a safety review and labeling of GM foods and ingredients, while in June 2000, Chile approved a decree that requires mandatory labeling of GM foods or foods containing GM ingredients at levels of 1 percent or higher. Mexico and the Philippines are also both considering mandatory GM labeling regulations. In Thailand, 40 GM plants have been exempted from a prohibition in their use in processed foods and animal feeds, although this amendment does not allow these plants to be either imported or planted domestically. Saudi Arabia has proposed an import ban on GMOs, and, as of December 1, 2001, the mandatory labeling of foods containing GM ingredients at levels of 1 percent or higher, while Sri Lanka has actually banned imports of GMOs.

Brazil is an interesting case, especially in light of its importance in the global soybean complex. The Brazilian Biosafety Law was enacted in 1995, prohibiting entry of GMOs without prior approval. Under this law Brazil approved GM soybeans for planting, and also decided to allow Bt corn to be imported from Argentina for use in animal feed. A federal judge, however, subsequently stopped the commercial planting of GM soybeans, and the Brazilian government used the Biosafety Law to block imports of Bt corn. In addition, Brazil has passed a decree requiring labeling of foods containing four percent or more of GM ingredients, the decree being effective as of December 31, 2001.

GMO Regulations and the WTO

The preceding discussion suggests a very clear potential for conflict between the two basic approaches being adopted to regulate GMOs.¹⁵ On the one hand there is the US/Canadian approach to evaluating GMOs, which is based on a scientific, risk-based assessment that also appeals to the concept of substantial equivalence, and the notion that zero risk in food safety regulation is not practical, given that conventional foods are already presumed to be safe. On the other hand, there is the approach adopted by the EU, based on a precautionary approach to risk assessment and the mandatory labeling of GMOs.

Interestingly, the first formal complaint to the WTO over GMO import regulations concerned a prohibition on imports by Egypt from Thailand of canned tuna containing GM soybean oil (WT/DS205/1). While this dispute has now been settled, it is indicative of the likelihood of conflict over GMO regulations as they impact international trade.

¹⁵ See Josling and Patterson (*op. cit.*) and Ford Runge, Bagnara, and Jackson (2001) for discussions of the political, social and cultural explanations for the differences between US and EU biotechnology regulation.

Given the potential for conflict, how do GM regulations fit into the rules of the WTO? It should be recalled that much GMO regulation is not within the purview of trade rules. The WTO explicitly recognizes the right of countries to develop policies that protect human, plant and animal health (GATT Article XX).¹⁶ Therefore, the WTO could not get involved directly in regulations for testing and adoption of GMOs in specific countries. In this sense, even the Biosafety Protocol may not be in conflict with obligations countries have under the WTO (Anderson and Nielsen, 2001).¹⁷ The WTO would, however, be involved in any potential conflict over GMO regulation insofar as the rules involve import restrictions covered in the GATT, health and safety regulations covered by the SPS Agreement, or technical regulations and standards that fall within the scope of the TBT Agreement (Nelson, *op. cit.*). Even though the preamble to the Biosafety Protocol explicitly states that it is not intended to override any obligations under other international agreements, it is not yet clear whether rights to restrict trade in living modified organisms (LMOs) as embodied in the Biosafety Protocol will generate conflict with the SPS and TBT Agreements (Heumüller and Josling, 2001).¹⁸

The two main principles in the WTO that would impinge on the regulation of GMOs in world trade are those of *non-discrimination* (GATT Article I), and *national treatment* (GATT Article III). It would neither be WTO consistent to ban imports of GM products from one WTO member and allow them from another, nor to impose additional restrictions on GM products once the product had been imported if such restrictions were not imposed on domestic

¹⁶ The relevant section of GATT Article XX reads, "...nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures: ... (b) necessary to protect human, animal or plant life or health..."

¹⁷ The Cartagena Protocol on Biosafety (2000), which concerns the international transfer of living modified organisms (LMOs), was finalized and adopted in Montreal by 133 governments on 29 January 2000, and now has to be ratified by the parliaments of 50 signatories. A key to the Biosafety Protocol is that, in accordance with the precautionary approach, as contained in Principle 15 of the Rio Declaration on Environment and Development, its objective is to ensure that the transfer, handling, and use of LMOs does not have an adverse effect on biological diversity and impose risks on human health. There are several key features of the Protocol. Anyone wishing to export an LMO has to inform the relevant authority in the importing country of the intentional trans-boundary movement of the LMO. The importing country then has 90 days in which to notify the exporter of its decision as to whether trans-boundary movement can proceed. The decision to allow the import has to include a scientifically sound risk assessment. There is also a process for notification of any LMO that is placed on the market for direct use as food or feed, or for processing. In addition, any LMO intended for marketing as either feed, food, or processing has to be clearly identified that they "may contain" LMOs and are not intended for introduction into the environment. It is not clear whether this is a requirement for labeling of LMOs. The language of the Protocol implies accompanying documentation (Article 18, Clause 2), with standards to be yet worked out (Article 18, Clause 3).

¹⁸ It is interesting to note that there are several existing international environmental agreements, such as the Montreal Protocol on ozone depleting chemicals, which require trade restrictions among the signatories. Hudec (1996) argues such agreements can be regarded as a waiver between parties of their WTO obligations. However, if a WTO member is not a signatory of an international agreement, there is an issue of trade restrictions being in conflict with that country's rights under the WTO. Roessler (1996: 33-34) notes that GATT Article XX cannot be interpreted as permitting sanctions against countries that are not signatories to multinational agreements, arguing that, "To assume... that the Contracting Parties have already expressed in Article XX their consent to the imposition of trade sanctions against them in the framework of a multilateral agreement which they have not accepted is to leave the realm of interpretation and enter into that of lawmaking..."

producers of “like goods.”¹⁹ But it is unlikely that, for example, the EU would either explicitly discriminate against US exports of GM products, or allow domestic production of a GM product without regulation, but impose regulations on the imported product. However, there might well be a claim of discrimination if the EU, as a deliberate act of trade policy, were to ban imports of a GM product but allow imports of the conventional product. The key issue in any GMO dispute will therefore be the definition of “like goods”, i.e., does either genetic modification or presence of GM ingredients constitute sufficient grounds for differentiation from conventional products? Clearly, under the principle of substantial equivalence used in the US and Canada, import rules targeted specifically at GMOs that have been subject to rigorous pre-market approval would be considered discriminatory. However, by the EU’s concept of precaution, GMOs are clearly not viewed as being the same as their conventional counterparts, and, hence, are arguably not “like goods”.

The major precedent is the 1991 GATT panel ruling in the US-Mexico tuna-dolphin dispute (GATT, 1991). In this case, the right of the US to set its own standards for conservation of dolphins was not challenged, but it was found GATT-illegal to ban the import of tuna from Mexico because they used less dolphin-friendly fishing methods in the Eastern Tropical Pacific Ocean (ETP) where tuna and dolphins are observed to swim together. The US defended its ban on tuna imports from Mexico from a challenge under GATT Article III on the grounds that it was part of a domestic measure applied equally to both imported and domestic products, i.e., it was non-discriminatory. The panel ruled, however, that such reasoning held for the treatment of imported tuna as a *product* but that the US law referred to the *process* of tuna fishing. Catching dolphins along with the tuna could not affect tuna as a product. In other words, the panel interpreted GATT Article III to apply only to the treatment of the imported tuna inside the US and did not cover any harm caused to dolphins by tuna fishing activities outside of the US (Roessler, 1996; Hudec, 1996). Therefore, as Article III was limited only to the domestic effects of imports, the ban on Mexican imports of tuna was an embargo, and in violation of GATT Article XI:1.²⁰ The US also tried to justify its import ban under GATT Article XX (b) as an action necessary to protect animal life, and under GATT Article XX (g) as a means of conserving exhaustible natural resources. The panel ruled this would have allowed one party (the US) to determine unilaterally the policies of another party (Mexico), which would have undermined the multilateral nature of the GATT (Roessler, *op. cit.*). Due to the fact that Mexico chose not to have the tuna-dolphin panel report accepted by the GATT Council, it technically has no “precedential value” (Esty, 1994). Nevertheless, the WTO made a similar ruling in 1998 against the US’s Sea Turtle Conservation Act which banned importation of shrimp (a product) from

¹⁹ The relevant language in GATT Article III:4 states, “...The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favorable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use.”

²⁰ The panel’s discussion indicates very clearly that, under the national treatment principle of Article III, it would be consistent to apply a border adjustment tax to an imported product if an internal tax were levied on the like domestic product. In addition the panel noted that Note Ad Article III also allows other regulations to be applied to imported products if applied to the like domestic products. The panel then concluded that this refers only to measures applied to products, and that domestic regulation of tuna harvesting did not constitute such a regulation (GATT, 1991).

countries who did not require their shrimp fishing industries to use turtle excluder devices (a process) (Chambers and Kohn, 2001).

These two GATT/WTO rulings would suggest that a trade dispute between, say, the US and the EU, might revolve around whether regulations are targeted specifically at the process of genetic modification or GM food products themselves. The US would likely argue that if the GM and conventional food products are essentially equivalent, then both process-based and product-based regulations are in violation of GATT Article III, as they would be receiving “less favorable” treatment than domestic suppliers or other (non-GM) exporters. In particular, if GM products are considered safe, then basing GM regulations on the process of genetic modification would constitute a trade barrier as it could not be justified under Article XX.

However, Article XX itself has undergone successive elaborations and clarifications in recent years. In terms of the differing approaches to risk assessment and labeling of GMOs, the key is how these will be evaluated in terms of the SPS and TBT Agreements. The SPS Agreement, agreed in the GATT Uruguay Round in 1994, focuses on regulations that are explicitly used to protect human, animal, and plant health, the objective being to ensure that such regulations are science-based and do not distort trade (IATRC, 2001). The TBT Agreement, which originated in the Tokyo Round of GATT, and was subsequently modified in the Uruguay Round, covers technical regulations that focus on non-safety related attributes of all products, including the labeling and packaging of products. The objective of this agreement is to ensure that technical regulations be applied in a manner that is least trade disruptive, although it does not require scientific justification for any specific regulation. (IATRC, *op. cit.*; Josling and Patterson, 2001). Both Agreements include specifically regulations relating to process as well as product characteristics.

A straightforward interpretation of the SPS Agreement is that an import ban on a GM product implemented for reasons of health would have to meet the risk assessment criteria of the agreement, and scientific justification would have to be made if the risk exceeded international standards. One point of conflict might be where, say the US has approved a GM product under its own regulatory system, whereas the EU, appealing to the precautionary principle, determines there is still insufficient scientific evidence to approve that product for import. The 1997 WTO panel ruling on the EU’s prohibition on imports of hormone treated beef offers some guidance as to how a ruling might be made under the SPS Agreement. The key rulings of the panel, subsequently upheld by the Appellate Body, were that the hormone ban was not based on a risk assessment, violating Article 5.1 of the SPS Agreement, and that the EU had not provided scientific justification for a standard set above internationally recognized standards, which violated Article 3.3 of the SPS Agreement (Roberts, 1998). It remains to be seen whether the EU’s approach to regulating GMOs will be found in violation of the SPS Agreement, especially if they implement a science-based risk assessment.

Article 5.7 of the SPS Agreement does allow WTO member states to take precautionary measures if scientific information is unavailable, but at the same time members have to seek additional information (Roberts, *op.cit.*).²¹ Interpretation of the precautionary principle, and its application to GMO regulations, however, has triggered a good deal of debate in the popular and scientific media (Foster, Vecchia, and Repacholi, 2000). Gollier (2001) argues that the precautionary principle ignores the concept of “learn-then-act.” Rather than taking drastic preventative action today, it may be better to wait for new information if current and future preventative actions are good substitutes. The author does suggest that other aspects of uncertainty provide more support for application of the principle. If not taking preventative actions today increases future risk, this may raise agents’ willingness to provide for the future by being prudent today. Gollier *et al.*, (2000) have shown that prudence can outweigh the benefits of learn-then-act if agents have a utility function with a coefficient of relative risk aversion less than unity. In addition, if the introduction of, say, GM crops into the environment is an irreversible decision, then acting today by being cautious about their introduction may have an option value in terms of flexibility in the future. These authors also suggest that uncertainty about the state of the environment for future generations ought to be taken into account through application of a lower discount rate to any damages occurring in the future, which would tend to increase the benefits of taking preventative action today.

An additional problem, however, arises in that the EU, and other members of the WTO, may appeal to ethical, cultural, and religious grounds for restricting/banning imports of GM foods.²² Such language is clearly contained in Article 29 of the EU’s revision of Directive 90/220, and also Article 26 of the Biosafety Protocol. GATT Article XX (a) does allow the use of trade barriers to protect public morals, but there is insufficient detail in the article to allow one to predict how a dispute panel might actually rule (Heumueller and Josling, 2001).

This highlights the tension between the focus of the GATT/WTO on establishing rules to facilitate trade, and the increasing demands for consumers and other groups for other concerns to be incorporated into the regulatory system. The problem with ethical concerns entering the trade regulation arena is that most countries are themselves only just beginning to grapple with such issues through public debate. Therefore, it might actually be expecting too much of existing WTO arrangements to deal with ethical concerns as a basis for GM import regulation. In fact some observers have gone so far so as to suggest that the existing SPS and TBT agreements are inappropriate for dealing with GMOs, and that new agreements will have to be developed to evaluate the legitimacy of consumer and ethical concerns (Perdikis, *op.cit.*).

Finally, the use of mandatory labeling may be challenged under both the SPS and TBT Agreements. The EU, and other countries implementing such a policy, may be successful in defending the regulation on the grounds that it is a

²¹ The term precautionary principle is not used explicitly in the SPS Agreement, but the language in Article 5.7 clearly implies use of the principle, “...In cases where relevant scientific evidence is insufficient, a Member may provisionally adopt sanitary and phytosanitary measures on the basis of available scientific information...”

²² See Thompson (2000b)

short-run measure in the absence of definitive evidence of the safety of GM foods, and that the regulation is being implemented in a non-discriminatory manner between domestic and foreign producers (Caswell, 2000). But the nature of labeling laws does not suggest an intention to remove them when information becomes available. A challenge of labeling regulations seems highly likely in the future.

The focus of such a challenge is likely to come under the TBT Agreement. Heumueller and Josling (*op. cit.*) argue that if GM labeling is designed to cover a range of issues not explicitly related to health concerns, then it will most likely fall under the legal purview of the TBT Agreement and not the SPS Agreement. Josling and Patterson (*op. cit.*) also suggest that, in some respects, the TBT Agreement is somewhat less restrictive on the legitimacy of technical regulations than is the SPS Agreement, which follows from the fact that it does not require a risk assessment of any regulation, and does not require scientific evidence to support any regulation. This may explain why Australia and New Zealand make it very clear that they implemented mandatory labeling not because of any safety issue, but rather to give consumers information so that they can make an informed choice if they have ethical, environmental, religious, or other reasons for avoiding GM foods. Although application of the TBT Agreement to food products has so far been very limited, it is likely that a case involving labeling of GMOs will provide a test of whether it is legitimate to label a product based on the process by which it was produced.

The key clauses of the TBT Agreement are Articles 2.1 and 2.2. Article 2.1 is simply a restatement of GATT Article III that no less favorable treatment should be afforded to imports as compared to like products of national origin. As noted earlier, the important issue will be the definition of “like goods”. Heumueller and Josling (*op. cit.*) suggest that if the relevant benchmark for deciding a “like good” is its chemical composition, this would likely undermine domestic regulations on GM foods. Article 2.2 states that a technical regulation should not be more trade restrictive than necessary to fulfill some legitimate objective. Josling and Patterson (*op. cit.*) note that the list of legitimate objectives for technical regulations is pretty open ended. As a result, labeling of GM foods could be justified in terms of a consumer’s right to know, so that a case brought under the TBT Agreement could revolve around which is the least trade distorting form of labeling.

The comments on the EU’s 1998 notification to the TBT Committee of its proposed mandatory labeling regime, and the EU’s subsequent replies, are both an interesting example of the two differing approaches to GMO regulation, and the likely grounds for a dispute over labeling. In its response to comments by the US, the EU states that there is a difference between the concept of *equivalence*, which it intends to apply in labeling of GMOs, and the concept of substantial equivalence (G/TBT/W/78). The EU claims that the latter principle relates to the process of gaining authorization to place GMOs on the market, while the former is used to determine whether GM foods and foods containing GMOs should be labeled. Specifically, the EU claims that foods and food ingredients containing either rDNA or proteins resulting from genetic modification are not equivalent to their conventional counterparts, and, therefore, should be labeled.

In further comments, the US argues that the EU provides for no support for the argument that GM foods and ingredients are not substantially equivalent to foods produced by conventional methods, i.e., food products should

not be labeled on the basis of production method if their essential characteristics are unchanged. The US goes further to argue that by the EU's logic, traditional methods of plant breeding that result in changes in protein or DNA would also result in foods not being "equivalent", yet the EU is not requiring labeling of such foods (G/TBT/W/94). Resolution of this argument will have important implications for how the WTO handles future disputes over the labeling of products based on process as opposed to product characteristics.²³

Interestingly, the GATT panel in the tuna-dolphin dispute did rule in favor of US legislation for the "dolphin-safe" label (GATT, *op. cit.*). The panel considered that such labeling regulations were entirely consistent with the non-discrimination principles of GATT Article I:1. In particular, it was established that the labeling regulations applied to all countries whose vessels were fishing for tuna in the ETP, and not specifically Mexico. So while the US was not permitted to ban imports of tuna on the basis of the fishing process, it was able to implement a domestic labeling system based *on the process*, allowing consumers to make an informed choice based on their ethical preferences and attitudes towards conservation of dolphins (Roessler, *op.cit.*).²⁴ In addition, the panel explicitly recognized that fishing for tuna in the ETP could harm dolphins, i.e., there was a defined environmental problem (GATT, *op. cit.*).²⁵ This suggests that arguments about GM labeling will likely revolve around what type of label is necessary to provide appropriate information to those who have ethical or cultural objections to GM food, even if there are no established environmental or food safety problems associated with GMOs, i.e., a mandatory positive label on foods containing GM ingredients vs. a negative label stating the food contains no GM ingredients.

GMO Disputes as a Clash of "Rights"

In this paper it has been shown that there are two very different approaches to regulation of GMOs, one appealing to the principle of substantial equivalence, the other the precautionary principle, and that the global pattern of regulation falls into either one of these two approaches. This divergence of regulatory approaches has been characterized as a clash of "rights" (Nelson, *op.cit.*). The first right is the opportunity to develop and export products subject only to barriers incorporated into current WTO schedules. Many in the US would argue that Europe's concerns about GMOs are not based on "sound science", and, therefore, their moratorium on further approvals of GM varieties, and their use of the precautionary principle with respect to biotechnology regulation, is in violation of their international obligations under the SPS and TBT Agreements of the WTO. The US has a right to export GMOs under WTO rules. Adjudicating this case would be the province of a panel, as discussed above.

²³ As mentioned earlier, Australia and New Zealand use the principle of substantial equivalence in their approach to GMO regulation, yet, at the same time, they have also adopted mandatory labeling. While this may seem contradictory, by appealing to the principle of consumer sovereignty, it may be a way of evading arguments about whether GMOs are or are not equivalent to conventionally produced foods.

²⁴ Bhagwati and Srinivasan (1996) have an interesting discussion of how ethical preferences can be expressed through voluntary, private boycotts, with labeling allowing consumers to make choices.

²⁵ The label currently used on US canned tuna fish states that no dolphins were harmed in catching the tuna.

The second right is that of national governments to restrict access to their markets due to health and safety issues in cases where there is insufficient knowledge about the risks associated with new technologies such as genetic engineering. Essentially, the EU is pushing application of the precautionary principle to trade in GM crops, and food containing GM ingredients, and claims it is already enshrined in the WTO agreements, although they also state they do not want to see unwarranted recourse to the principle as a disguised form of protectionism. This right is particularly strongly supported by domestic politicians as well as by commercial interests that would be happy to see imported products kept out of the market.

The claims to these rights clearly represent an important challenge to the WTO/GATT. While the specifics of the argument over GM foods focus on whether they are equivalent or not to conventionally produced foods, the argument is essentially about the appropriate degree of regulation for GM foods, and standards for their approval and labeling. It should be pointed out however, that this is neither new nor unique to GMO regulation. There is already an ongoing debate about how to broaden the focus of the WTO/GATT to incorporate issues such as labor and environmental regulatory standards. The current WTO/GATT rules are essentially a legal framework set up to make and secure market access commitments from member countries. Within this framework, member governments have national sovereignty to choose their domestic regulations and standards, as long as negotiated market access commitments are not undermined.

Many groups, however, feel that the WTO/GATT is unfriendly to labor, environmental, animal welfare, and other social concerns. In addition, due to negotiation of successive multilateral trade agreements, governments have ceded national sovereignty over such policies. In particular, there is a fear that, due to pressures of maintaining international competitiveness, countries will compromise on enforcing strict labor and environmental standards, i.e., governments will either resist setting tougher regulations, what Bagwell and Staiger (2001a) term “regulatory chill”, or they may even set less restrictive regulations, the so-called “race to the bottom”.

Bagwell and Staiger (2001a) argue that these types of problems might be resolved very easily through the modification of existing WTO/GATT rules.²⁶ In the absence of the WTO/GATT, any country has a unilateral incentive to impose a tariff, knowing that part of the cost of such protection will be born by foreign exporting countries getting lower prices, i.e., there is a terms-of-trade effect, which alters relative market access levels across countries. Of course, other countries also have an incentive to impose such tariffs, resulting in an inefficient level of market access. Hence, the role of the WTO/GATT has been to secure Pareto improving, reciprocal exchanges of increased market access.²⁷

²⁶ Their analysis is based on a specific theoretical model of the GATT (Bagwell and Staiger, 1999, 2001b).

²⁷ Reciprocal exchange of market access has often been seen as a “mercantilist” explanation for GATT (Krugman, 1997). In contrast, Bagwell and Staiger (2001a) suggest that GATT resolves the problem of insufficient market access, because in the absence of cooperation, each country has a unilateral incentive to set higher than optimal tariffs.

Given this view of the WTO/GATT, the conflict between negotiated tariff reductions and incentives to introduce labor and environmental regulations can be seen as one of how to secure “property rights over negotiated market access commitments” (Bagwell and Staiger, 2001a: 19). Negotiated market access can be reduced in two ways: first, a country may feel constrained from unilaterally raising its tariffs because of WTO/GATT obligations, and, instead chooses unilaterally to lower domestic standards, thus improving the competitive position of domestic firms; second, a country may raise its domestic standards, and then raise tariffs by more than that necessary to offset the competitive effect of the higher standards. In order to resolve this problem, Bagwell and Staiger (2001b) argue that, though a country can set any domestic standards it wishes, in order to deal with increased import competition, it needs to address market access through its tariff policy in a manner that maintains negotiated levels of market access. This faces a government with the opportunity cost of its regulatory choice, i.e., domestic prices increase. This amounts to allowing governments both increased sovereignty over their domestic regulatory choices and also a way of meeting their international trading obligations. The WTO/GATT rules already allow for such a response under GATT Article III. If a country introduces a regulation that raises domestic firms’ costs, a country may apply a border tariff to protect the domestic industry from import competition as long as there is renegotiation of any market access rights that have been harmed (Roessler, *op.cit.*).

As suggested by Anderson and Nielsen (*op.cit.*), this might seem to solve the clash of “rights” over GMO regulation. The EU could set its own standards for GMO regulation, at the same time as maintaining market access to imports from the US. The problem with this argument is the fact that EU GMO regulation is based on the notion that GM and non-GM products are not “like goods.” If the EU, and most European consumers, do not regard GM foods as being equivalent to conventional foods, there is a desire not only to regulate GMOs at the border but also within the EU, i.e., imports have to meet the same regulatory standards as GM foods approved within the EU, and also have to be labeled. So the issue is not one of the EU raising standards for its own producers, and then facing increased import competition, instead, it wants all GM foods, both domestic and imported, to be subject to the same set of regulations. The result is what Josling and Patterson (*op. cit.*) have termed “consumer over-protection,” in effect a “race to the top”. As a result, the US would likely argue that market access for its products is being reduced below negotiated levels on the basis of the EU’s restrictive GM food standards.

A possible solution to the market access problem may lie in the idea that countries could set domestic GMO standards reflecting their own risk valuations, but then allow *greater* market access to those exporters who are able to meet the domestic standard (IATRC, *op. cit.*). This is essentially what would happen in a successful “non-violation” complaint, which is a mechanism whereby an exporting country can ensure that its negotiated market access is maintained. Under GATT Article XXIII, countries have a right to bring “non-violation” complaints if they believe negotiated levels of market access are being adversely affected by a trading partner’s domestic regulations, a successful complaint resulting in a “rebalancing” of market access commitments (Bagwell and Staiger, 2001a).

This option of “rebalancing” has already been suggested in the hormone-treated beef case, where US beef exports could be given increased market access to the EU, as long as the beef is certified hormone-free.²⁸ The analogy here would be increased access for certified, and labeled non-GM foods, while GM foods would be subject to stated regulations for approval, import and labeling. The net result would be maintenance of overall negotiated access for say soybeans broadly defined, with increased access for the non-GM soybeans compensating for any decline in imports of GM soybeans. In addition, countries will still be faced with the opportunity cost of their regulatory choice: labeling of non-GM foods will require identity preservation of non-GM ingredients, the costs of segregation being passed through to consumers in higher food prices.

Summary and Conclusions

This paper has examined the issue of the treatment in the WTO of national regulations relating to trade in GM foods. Despite rapid adoption of GM crops in North America and Argentina, the consuming public in many European and Asian importing countries remains unconvinced about the safety of such crops and wonders about the long-term environmental effects of the technology. The response of many importing countries has been to develop relatively restrictive procedures for pre-market approval of GM crops and foods, and to require mandatory labeling of such foods. While the major exporting countries have yet to seek a WTO panel ruling on these regulations, there is no doubt that GMO trade will be on the agenda in the agriculture negotiations. Exporting countries will argue that importing countries’ regulations are too restrictive, given existing scientific knowledge of the safety of current GM crops, and that labeling of GM foods is unnecessary due to the fact that they are typically similar to their conventional counterparts. In response, importing countries will argue that existing scientific knowledge about GMOs is insufficient, and that a precautionary approach to approval is appropriate. In addition, importers will claim that labeling is necessary due to the fact that they are not equivalent to their conventional counterparts, and consumers have a right to choose whether or not consume such foods, be it for religious, ethical or other reasons.

In the event a panel will have decide on whether GM and non-GM products are “like goods”, whether adequate risk assessment was undertaken for any regulation introduced for health reasons, whether labels constitute the “least trade distorting” way of meeting legitimate objectives, and whether regulations imply discrimination among suppliers or in favor of domestic producers. Experience with the SPS and TBT Agreements has not been extensive enough to indicate how such a panel might rule. But one can also view the issue in broader trade policy terms, as a balance between market access obligations that need to be adjusted as domestic regulations on new technologies are developed.

A possible solution is for importing countries with tough GM regulation and mandatory labeling to offer reciprocal increases in market access for non-GM foods in compensation for any losses of market access for GM foods. There

²⁸ This is exactly the way Bhagwati and Srinivasan (1996: 187) have suggested the WTO deal with ethical preferences, “...Unilateral suspension of trading access for reasons based on ethical preference should not be sanctioned by the WTO. Such unilateral suspensions should be ‘paid for’ by other, equivalent trade concessions...”

is a question though of whether such “rebalancing” is actually practical, and it would certainly add to the costs of dispute settlement in the WTO, but it may be the only viable solution in the long run if the WTO is not to be dragged into evaluating social and ethical bases for regulation of biotechnology.

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