ARE BIOTECH CROPS AND CONVENTIONAL CROPS LIKE PRODUCTS? AN ANALYSIS UNDER GATT

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The transatlantic debate over the use of genetically modified organisms ("GMO"s) as food products, with the US as a proponent on one side, and the European Union ("EU") as an opponent on the other, is set to take center stage. The US has initiated formal legal action under the World Trade Organization Dispute Settlement System, charging that the EU violates several agreements of international trade law, including Article III of GATT, an anti-protectionist measure which forbids a country from favoring its own products over imported "like products." The US claims that GMOs and conventional crops are "like products,, and that the EU moratorium on GMOs thus violates Article III. This iBrief assesses the US "like products" claim, most notably in light of Asbestos, *a recent WTO case which provides important guidance for determining likeness under four criteria.*

INTRODUCTION

¶1 Since 1998, the EU has imposed a *de facto* ban on the use of genetically modified organisms ("GMOs") in food products. On May 13, 2003, the US announced its intention to initiate consultative talks with the EU as required as part of its pursuit of legal action through World Trade Organization ("WTO") Dispute Settlement Process ("DSP"). Argentina and Canada joined the US legal effort as co-complainants. The mandatory 60 days of negotiation resulted in an impasse,[2] and has led to the appointment of a dispute panel to adjudicate on the matter.[3] Although the debate over the use of GMOs has existed for more than a decade, several events in the past months have brought the GMO controversy back to the forefront of the public eye. Some of these events include the ratification and entry into force of the Cartegena Protocol to Biosafety, which establishes for the first time notification procedures on the import of living modified organisms;[4] the approval of new legislation concerning labeling and traceability requirements of GMOs in the

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[2] David Leonhardt, *Talks Collapse on U.S. Efforts to Open Europe to Biotech Food*, N.Y. TIMES, June 20, 2003, at A1.
[3] *WTO Launched Probe Into EU Biotech Policy*, REUTERS, Aug. 29, 2003 (on file with DUKE L. & TECH. REV.).
[4] *Id.*

EU;[5] the announcement of new GM food standards by the Codex Alimentarius Commission, an international standards creation body;[6] and the concurrent US threat of legal action.

¶2 The involvement of such diverse legal and policy instruments and institutional actors typifies the fragmented and unharmonized nature of international biotechnology regulation; it also reflects the international community's difficulties in grappling with the societal implications of biotechnology use. Biotechnology is new and poorly understood; in many legal regimes, such as in international trade law under GATT, there have been no provisions to deal address biotechnology until the recent ratification of the Protocol on Biosafety. Rather, actors in these dramas have attempted to fit square pegs into round holes, applying existing trade law to the novel features of biotechnology. One of the relevant articles of international trade law to the GMO dispute is the national treatment rule embodied in Article III of the GATT.[7] The national treatment rule is essentially an anti-protectionist provision; it functions to forbid GATT members from favoring domestic products over imported "like products" through the use of fiscal[8] or regulatory[9] trade measures. In the context of the transatlantic GMO dispute, the US argues that the EU's GMO moratorium is a protectionist move which favors EU's domestic production over the like (albeit genetically modified) products of the US, which otherwise dominates the agricultural biotechnology industry. The opposing EU position is simply that GMOs and conventional crops are not like products due to their fundamental characteristics.

THE BENEFITS AND CRITICISMS OF GMOS

¶3 The US has championed the use of GMOs as a potential and probable solution to world famine and malnutrition.[10] It is argued that crop yields can be boosted substantially through the use of transgenic crops,[11] which can be designed to survive in drought or frost, remain fresh longer, resist insects or disease by manufacturing their own bio-pesticides, and tolerate herbicides to allow farmers to spray weed killers without damaging the crops.[12] These advantageous characteristics would allow farmers to minimize the use of chemical fertilizers, pesticides, irrigation and fuel and subsequently convert these savings into additional crop output, while at the same time reducing the harmful effects of chemical fertilizers and pesticides on the environment. A study by the US Department of Agriculture showed that total pesticide use was reduced by

[5] Lizette Alvarez, *Europe Acts to Require Labeling of Genetically Altered Food*, N.Y. TIMES, July 3, 2003, at A3.
[6] *See* Food and Agriculture Organization of the United Nations, *Codex Alimentarius Commission adopts more than 50 new food standards*, July 9, 2003, *at* http://www.fao.org/english/newsroom/news/2003/20363-en.html.
[7] The General Agreement on Tariffs and Trade [GATT], as amended and in force on Jan. 1, 1995, 55 U.N.T.S. 187; B.I.S.D. Vol. IV.
[8] GATT, Art. III:2.
[9] GATT, Art. III:4.
[10] Elizabeth Becker & David Barboza, *Battle Over Biotechnology Intensifies Trade War*, N.Y. TIMES, May 29, 2003, at C1.
[11] Transgenic organisms are created by introducing genetic material from a different species into the host organism.
[12] Sean D. Murphy, *Biotechnology and International Law*, 42 HARV. INT'L L.J. 47, 54 (2001).

6.2 percent in 1997 as a result of the use of biotechnology.[13] Higher crop yields can also translate to less urgency to convert lands for agriculture.[14] An additional benefit is the engineering of crops with higher nutritional value, a prime example of which is "golden rice," which is enhanced by vitamin A precursor, beta-carotene, and marketed in Southeast Asia where vitamin A deficiency is high.[15]

¶4 Although there have been certain studies suggesting potential short-term risks of specific varieties of GMOs, much of the aversion to GMOs stems from the lack of certainty of its long-term health effects. This has prompted many environmental and consumer groups to advocate for a moratorium on GMO consumption until extensive long-term testing is done.[16] An oft-cited study on Monarch butterflies, which reported the harmful effect of pollen from corn producing Bacillus thuriniensis (Bt), a bio-pesticide, highlights the perceived risks of biotechnology crops on human health.[17] The study prompted the EU to suspend importation of certain corn hybrids already approved for sale in Europe.[18] Human allergies pose another cause for concern: In 2000, negatively affected taco shells sold in US grocery stores were recalled when they were found to contain genetically modified corn that was unapproved for human consumption due to possible allergic reactions.[19]

¶5 While bio-pesticides may reduce the use of environmentally harmful chemicals, herbicide and insecticide-resistant crop would have the opposite effect of encouraging its use.[20] Unrestricted gene flow, most likely in the form of the transfer of bio-engineered traits to wild relatives through pollination, can also lead to undesirable consequences, such as the conferring of herbicide-resistant traits of a GMO to weeds, creating uncontrollable "superweeds."[21] Increased insecticide use encouraged by the use of insecticide-resistant transgenics may induce mutations in insects, creating "superbugs."[22] Potential downstream effects to biodiversity are also worrisome. Bio-pesticides may harm other insects that prey on the actual pests, disrupting the balance of the food web.[23] Large-scale cultivation of transgenics - as opposed to that of naturally selected crops - results in genetically homogenous cropping systems.[24]

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[13] Richard Cowan, *Global Biotech Food Fight Moves to Calif.*, REUTERS, Jun. 23, 2003 (on file with DUKE L. & TECH. REV.).
[14] *But see* Margaret Ross Grossman, *Biotechnology, Property Rights and the Environment*, 50 AM. J. COMP. L. 215, 218 (2001) (asserting that no yield increases due to biotechnology had hitherto been documented).
[15] Murphy, *supra* note 12, at n. 34.
[16] *Id.*, at 57.
[17] Neil D. Hamilton, *Legal Issues Shaping Society's Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81, 95 (2001).
[18] *Id*.
[19] Murphy, *supra* note 12, at 57.
[20] *Id.* at 59.
[21] *Id.*
[22] *Id.*
[23] Grossman, *supra* note 14, at 220.
[24] *Id.* at 221; On the other hand, some argue that the use of biotechnology improves tracking and conservation of plant genetic resources in seed banks.

¶6 Ethical concerns comprise another dimension to the active GMO opposition expressed by the EU. Some feel that genetic modification or engineering of crops is not a natural extension of traditional plant breeding techniques as it violates a "natural order" which should be respected and not violated.[25]

THE US-EU DISPUTE

¶7 The US and EU employ starkly contrasting regulatory approaches to GMOs. This section will explore the structural differences of the two regulatory regimes through the lens of the controversial principle of substantial equivalence. The principle was first formulated in 1992 by the Organization for Economic Cooperation and Development ("OECD") in an effort to develop a scientific approach to safety evaluation of new foods or food components in comparison with traditional ones.[26] The principle set out that if a GMO is determined to be substantially equivalent to an existing food, then no additionally safety measures need to be pursued. However when substantial equivalence cannot be found, then the identified differences should be subject to further safety evaluations. The controversy of the principle lies in its vague and subjective evaluative terms, involving a comparison of "components" and "traits" which are not further defined[27]; indeed, no standardized objectives test to determine substantial equivalence were articulated by OECD.[28] The initial application of the principle focused only on chemical compositional analysis, but this was heavily criticized as "pseudo-scientific" for ignoring biological, toxicological and immunological tests.[29] The concern is that although traditional plant breeding is not natural, it builds upon "nature's vast storehouse of information, accumulated over millions of years of experimentation, as to what works and what doesn't," whereas genetic engineering creates novel changes which could never occur in nature, thereby creating potential upsets to the balance of downstream biochemical pathways.[30]

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[25] *See generally* Paul Thompson, *Food and Agricultural Biotechnology: Incorporating Ethical Considerations,* Prepared for the Canadian Biotechnology Advisory Committee, Oct. 18, 2000, *at* http://www.agriculture.purdue.edu/agbiotech/incontroversy.html.

[26] Schenkelaars Biotechnology Consultancy, *GM Food Crops and Application of Substantial Equivalence in the European Union* 10, June 21, 2000, *at* http://www.botanischergarten.ch/debate/archive2001_2.htm.

[27] *See* Organization for Economic Cooperation and Development, *Safety Evaluation of Foods Derived by Modern Biotechnology: Concepts and Principles* 11 (1992) ("[S]ubstantial equivalence takes into consideration a number of factors, such as: knowledge of composition and characteristics of traditional . . . product; knowledge of the new component(s) or trait(s) as expressed in the precursor(s) . . . ; and knowledge of the new product/organism with the new components or trait(s) including the characteristics and composition . . . .") *at* http://www.agbios.com/docroot/articles/oecd_fsafety_1993.pdf.

[28] Thomas O. McGarity, *Seeds Of Distrust: Federal Regulation Of Genetically Modified Foods,* 35 U. MICH. J. L. REF. 403, 430-31 (2002).

[29] Eric Millstone, Eric Brunner and Sue Myer, *Beyond "Substantial Equivalence"*, 401 NAT., Oct. 7, 1999, at 525-26.

[30] McGarity, *supra* note 28, at 427.

Current EU Regulation of GMOs

¶8 At the heart of the US-EU conflict is the blocking of EU-legislated GMO approval procedures by EU countries, resulting in a *de facto* moratorium on GMO imports. The centerpiece of the EU legislation is Directive 2001/18/EC on the deliberate release into the environment of GMOs (the "Directive").[31] The Directive provides a general regime for the release of GMOs to the marketplace or environment, including provisions for regulatory approval procedures, risk assessments and labeling requirements.[32] Additional to this horizontal regime are bodies of sectoral legislation on novel foods and their ingredients which apply to specific GMOs and are controlling over the horizontal regime as long as they provide equivalent standards of risk assessment, labeling, and traceability.[33] Directive 90/220/EC failed to assure the public of the safety of GMOs, leading to political pressure for tougher legislation as well as a 1998 "declaration of suspension" from Denmark, Greece, France, Italy and Luxembourg to block the GMO authorization process until stricter labeling and traceability measures were created.[34] Because these five countries hold enough votes to form a blocking minority in the objections phase of the authorization process under a Directive, a *de facto* ban on further authorizations resulted, despite there being no formal moratorium at the EU level.[35] Despite the strengthening of the horizontal regime in several ways by the adoption of Directive 2001/18/EC,[36] Austria, Denmark, France, Greece, Italy and Luxembourg issued a statement insisting that this new Directive was only a partial improvement.[37] Finally, in July, 2003, stricter requirements for labeling and traceability were promulgated, possibly paving the way for the lift of the EU "moratorium."

¶9 In the period preceding this trade blockage, the validity of the principle of substantial equivalence occupied much discussion. The EU initially accepted the concept of substantial equivalence as applied by the US; this acceptance is evident in its use of the concept in the EU Novel Foods Regulation 258/7 as a basis for requiring only a provision of a scientific justification for the claim rather than a risk assessment.[38] However,

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[31] Council Directive 2001/18/EEC, 1990 O.J. (L 106) 1 (repealing Council Directive 90/220/EEC, 1990 O.J. (L. 117) 15).

[32] *See EC Regulation of GMOs and its Application*, GEO. UNIV. L. CTR., INST. OF INT'L ECON. L. *at* http://www.law.georgetown.edu/iiel/current/gmos/gmos_ec.html (last visited June 26, 2003) (providing a detailed overview of EU's GMO regulatory regimes).

[33] *Id.*

[34] *Id; see also* Stephen Tromans, *Promise Peril, Precaution: The Environmental Regulation of Genetically Modified Organisms*, 9 IND. J. GLOBAL LEGAL STUD. 187, 196 (2001). A weaker declaration by Austria, Belgium, Finland, Germany, Netherlands and Sweden also urged for the use of the precautionary principle and not to approve GMOs until stricter standards were in place.

[35] Anna Meldolasi, 20 NAT. BIOTECH. 758, 758 (2002).

[36] *See* Tromans, *supra* note 34, at 198-99 (summarizing the improvements of Directive 2001/18/EC over 90/220/EC).

[37] *Id.* at 199.

[38] Les Levidow a& Joseph Murray, *The Decline of Substantial Equivalence: How Civil Society demoted a Risky Concept* 5, PAPER FOR CONF. AT INST. OF DEV.STUDIES, Dec. 12-13, 2002, *at* http://www.polisci.berkeley.edu/faculty/bio/permanent/ansell,c/foodsafety/levidow.html ("Science and citizenship in a global context: challenges from new technologies").

opposition to the concept arose from the start, with civil society groups mounting serious challenges to its scientific foundation.[39] Scientists debated over the adequacy of chemical compositional analysis, advocating for more nuanced molecular techniques such as mRNA analysis, proteomics, and DNA-array,[40] as well as long-term field tests.[41] Policy makers eventually backpedaled on the principle; OECD itself acknowledged that substantial equivalence was not a "substitute for a safety assessment," but represented only a "guiding principle" for the safety analysis of GMOs and did not preclude further toxicological and immunological testing if necessary.[42] In 2000, the Scientific Committee on Food affirmed Italy's ban on four varieties of genetically modified maize, thereby criticizing the principle of substantial equivalence, which had been used to sidestep a full safety assessment.[43] Opposition to the principle would culminate in the abandoning of the concept altogether in the new Regulation on Genetically Modified Food and Feed, which would eventually replace the Novel Food Regulation 258/97.[44]

The US Position and Legal Claims

¶10 In contrast, GMO regulation in the US is more loosely assembled. Notably, there is no single authority to perform overall oversight of GMOs. Instead, the Office of Science and Technology, an executive agency, has established the Coordinated Framework for Regulation of Biotechnology, which delegates the responsibilities of GMO regulation to three administrative agencies: the US Department of Agriculture ("USDA"), which determines whether GMOs are "safe to grow"; the Environmental Protection Agency ("EPA"), which determines whether GMOs are "safe for the environment"; and the Food and Drug Agency ("FDA"), which determines whether GMOs are "safe to eat."[45] It is important to note the FDA's decision that GMOs are substantially equivalent to conventional foods, thus obviating the need for special labeling or approval procedures with the exception of genetically modified products known to contain allergens.[46]

¶11 Several crucial features of US policy and culture that have shaped American attitudes on GMOs include American agriculture's tradition of successful reliance on technology; the US's world leadership in the field of biotechnology; the reliance on scientifically based risk assessments in environmental and health policy creation and corresponding skepticism of subjective, non-scientific objections to the technology; and

[39] *See generally id.*
[40] *Id.* at 13.
[41] *Id.* at 8.
[42] Peter Kearns & Paul Mayers, *Substantial Evidence is a Useful Tool*, 401 NAT. 640 (1999).
[43] *See* Levidow, *supra* note 38, at 12.
[44] *Id.*
[45] Grossman, *supra* note 14, at 224.
[46] *See* US Food and Drug Administration, *Statement of Policy: Foods Derived from New Plant Varieties*, 57 Fed. Reg. 22984 (1992).

the US's belief that GMOs are a viable solution to famine in the Third World.[47] In contrast, the EU experience with GMOs is marred by a series of food crises such as "mad cow disease" and foot and mouth disease; these afflictions have deeply shaken consumer confidence in governmental food regulation even though these crises are not related to GMOs.[48] Thus, vastly different experiences help explain the transatlantic dichotomy in attitudes toward GMO regulation.

GATT AND THE NATIONAL TREATMENT RULE OF ARTICLE III

¶12 The US has indicated that EU's *de facto* moratorium on the approval of biotech foods violates at least four international trade agreements: the Agreement on the Application of Sanitary and Phytosanitary Measures ("SPS Agreement"), the Technical Barriers to Trade Agreement ("TBT Agreement"), the Agriculture Agreement, and the General Agreement on Tariffs and Trade ("GATT").[49] The WTO establishes a hierarchy of international agreements if there is a conflict between WTO rules, with the SPS Agreement and the TBT Agreement taking precedence over GATT.[50] Nevertheless, it has been suggested that a GATT analysis will still be relevant for two reasons.[51] First, the scope of the SPS Agreement does not cover consumer right-to-know measures, which is one of three EC objectives[52] which could alone justify a GMO ban and be analyzed under GATT.[53] Second, the TBT Agreements apply only to "technical regulations,"[54] but may not apply to outright bans such as the EU's *de facto* GMO moratorium.[55] Moreover, the moratorium is not authorized through any single central EU document or piece of regulation, but is a result of the collective action of member EU states to block the approval process through a seeming fiat. This confusion and uncertainty as to which agreement is most applicable reflects the reality that international trade rules were

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[47] *See* Neil D. Hamilton, *Legal Issues Shaping Society's Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81, 87-97 (2001) (identifying various fundamental features of American policy and culture regarding biotechnology).

[48] *See also* Pew Initiative on Food and Biotechnology, *U.S. vs. EU: An Examination of the Trade Issues Surrounding Genetically Modified Food* 6-7, Aug. 6, 2003, *at* http://pewagbiotech.org/resources/issuebriefs/ (examining the underlying causes of general European aversion to GMOs).

[49] *European Communities—Measures Affecting the Approval and Marketing of Biotech Products: Request for Consultations by the United States*, WT/DS291/1, G/L/627, G/SPS/GEN/397, G/AG/GEN/60, G/TBT/D/28, May 20, 2003, *at* http://www.law.georgetown.edu/iiel/current/gmos/index.html.

[50] WTO General Interpretive Note To Annex 1A, *available at* http://www.wto.org/english/docs_e/legal_e/05-anx1a_e.htm.

[51] *GMOs and WTO Law*, GEO. UNIV. L. CTR., INST. OF INT'L ECON. L., *at* http://www.law.georgetown.edu/iiel/current/gmos/gmos_wto.html .

[52] *Id.*(The other two objectives are human health and the environment.).

[53] *Id.*

[54] "Technical regulation" is defined as a "[d]ocument which lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory." TBT Agreement, Annex 1.1.

[55] INST. OF INT'L ECON. L., *supra* note 51.

not drafted to address the recent emergence and complexity of biotechnology.[56] The result is an extremely complicated and delicate mode of legal analysis of the US-EU GMO dispute under fragmented legal regimes.

¶13 Article III of the GATT, dubbed the "national treatment rule", is the central provision which require WTO members to provide equally competitive conditions for imported products as are provided for domestic products.[57] The basic premise of Article III is to guard against protectionism perpetrated through the enactment of internal tax and regulatory measures.[58]

¶14 Specifically, Article III:4 reads in part:

> 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 . . . .

(emphasis added).[59] Thus, if a country enacts a trade measure disfavoring an imported product in relation to a domestic product, which is deemed "like" the imported product (for example by imposing import quotas on a product) then it would be in violation of Article III:4. In the context of the GMO dispute, the US contends that the EU's "moratorium" on GMOs favors its own homegrown crops (viewed by the US as like products), thereby violating Article III:4. The EU argues that GMOs and conventional crops are not like products. Although the EU's "moratorium" is origin-neutral in that it applies to all GMOs from all nations, its actual effect is to discriminate against US products. The next relevant inquiry is how a WTO panel will assess the "likeness" of GMOs as compared to conventional crops.

Like Products: Analytical Frameworks

¶15 Under GATT, the determination of whether two goods are “like products” can be analyzed under two distinct frameworks: the Border Tax Adjustments Test (“BTA”) and the “Aim and Effect” test. The former approach has been followed and developed by subsequent WTO panels and the Appellate Body,[60] and consists of the following criteria:

1. The properties, nature and quality of the products;
2. The end-uses of the products;
3. Consumers’ tastes and habits; and

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[56] Arthur E. Appleton, *Labeling of GMO Products Pursuant to International Trade Rules*, 8 N.Y.U. ENVTL. L.J. 566, 570.
[57] Won Mog Choi, *Overcoming the “Aim and Effect” Theory: Interpretation of the “Like Product” in GATT Article III*, 8 U.C. DAVIS J. INT’L L. & POL’Y 107, 107 (2002).
[58] GATT, Art. III:1.
[59] GATT, Art. III:4.
[60] Appellate Body Report, *European Communities—Measures Affecting Asbestos and Asbestos-Containing Products,* Mar. 12, 2001, WT/DS135/AB/R, at ¶ 88 [hereinafter *Asbestos*].

4. The tariff classification of the products.[61]

In the recent *Asbestos* case, the Appellate Body clarified that these criteria are applied on a case-by-case basis[62], and are "neither treaty mandated nor a closed list."[63] However, a panel must examine all pertinent evidence and is not free to ignore any of the four criteria if they are applicable.[64] It has been observed, however, that most panels have focused on the more objectively ascertainable criteria of product properties, end-uses and tariff classifications, and less so on the more subjective criteria of consumer habits.[65]

¶16 The "Aims and Effects" test, on the other hand, considers whether a trade measure has the "purpose and effect" of affording protection to domestic production over imported production.[66] If the answer is affirmative, the two products will be viewed as "like products." However, this approach has received criticism for its lack of textual basis,[67] the fact that it has been followed by only two panel decisions, and the fact that it has been discounted as inappropriate by other WTO tribunals.[68] Thus, a WTO panel will almost certainly employ the BTA test should the question of "like products" arise again.

THE *ASBESTOS* RULING

¶17 The *Asbestos* case involved a Canadian challenge to the French ban on asbestos and asbestos-containing products on the basis that the ban adversely affected the trade of such products in violation of, among other provisions, Article III:4 of GATT.[69] The *Asbestos* case is relevant to a "like products" analysis of GMOs and conventional foods for two reasons. First, the case (the most recent along a line of at least twenty-four previous GATT/Panel cases to discuss "like products")[70] provides clarifying interpretations of how to apply the four BTA criteria. Second, the nature of the dispute in the *Asbestos* case is analogous to the US-EU GMO dispute in the sense that it involves a trade measure enacted for the purported purpose of protecting against a perceived human health risk.

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[61] *Id.* at ¶ 101.
[62] *Id.* at ¶ 102. *See also* Appellate Body Report, *Japan—Taxes on Alcoholic Beverages*, Oct. 4, 1996, WT/DS8/AB/R. ("The criteria in Border Tax Adjustments should be examined, but there can be no one precise and absolute definition of what is "like". The concept of "likeness" is a relative one . . . that must be determined by the particular provision in which the term "like" is encountered as well as by the context and the circumstances that prevail in any given case to which that provision may apply.")
[63] *Id.*
[64] *Id.*
[65] Choi, *supra* note 57, at 112 n.24 (detailing the decisional basis for "like products" analysis in relevant WTO panel reports).
[66] *Id.* at 115.
[67] *Id* at 117.
[68] *Id* at 113. *But see* Donald Regan, *Regulatory Purpose and "Like Products" in Article III:4 of the GATT (With Additional Remakes on Article III:2)*, 36 J. WORLD TRADE 443, 446-47, 460-63 (2002) (providing an alternative interpretation of GATT Article III and WTO case law to find support for an enquiry into regulatory purpose).
[69] The other claims of violations fell under the TBT agreement, and Articles XI and XXIII:1(b) of GATT.
[70] *Asbestos*, *supra* note 60, at n.58 (citing previous panel and appellate cases which dealt with "like products").

¶18 In overturning the panel's analysis that chrysotile asbestos fibers, on the one hand, and PVA, cellulose and glass (PCG) fibers on the other are "like products," the Appellate Body clarified that the application of the four BTA criteria varies on a case by case basis[71] but is guided by the goal of preventing trade protectionism and ensuring equality of competitive conditions in the marketplace.[72] The greater the similarities of two products in the marketplace, the higher the probability that they will be deemed "like products."[73] Market competitiveness and substitutability are most reflected in the end-uses and consumer tastes criteria. The majority of the Appellate Body found that market substitutability is a necessary and sufficient condition for finding likeness, whereas the concurring member of the Body was willing to find that chrysoltile fibers are not like PCG fibers based on the stark and established differences in health risk alone, despite a clear finding of a competitive relationship.[74]

¶19 Most significantly, in examining the properties of the products, the Appellate Body held that differential health risks posed by two products can be a relevant factor, overturning the Panel's ruling that considering health risks would nullify the legal effect of Article XX(b), which provides an exception for the use of human health as a basis to enact trade restriction of "like products."[75] In other words, the examination of physical properties of a product need not end at its physical characteristics but rather can include the consequences that flow from those physical characteristics.[76] Additionally, the Appellate Body determined that molecular structure and chemical composition were relevant factors in the analysis of the physical properties of the chrysotile fibers as those factors affected the fiber's carcinogenicity.[77]

¶20 Under the end-uses analysis, the Appellate Body criticized the Panel's approach of focusing only on a narrow scope of overlap of end-uses in concluding that the products were similar, while disregarding differing applications to which the separate products could be put. Thus, a proper analysis of end-uses requires that evidence of unlikeness based on different end-uses be considered and that the number of similar applications outweigh the number of different applications.[78]

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[71] *Id.* at ¶ 102.
[72] *Asbestos*, *supra* note 60, ¶¶ 97-99 (reasoning that the anti-protectionist principles of Art. III.1 inform Art. III.4).
[73] *Id.* at ¶ 99 ("[T]he word "like" in Article III:4 is to be interpreted to apply to products that are in such a competitive relationship. Thus, a determination of "likeness" under Article III.4 is, fundamentally, a determination about the nature and extent of a competitive relationship between and among products.")
[74] *Id.* at ¶ 152.
[75] *Id.* at ¶ 113. In conservative fashion, despite its assertion that the BTA criteria is not an exhaustive list, the Appellate Body reasoned that health risks need not be considered a separate criterion, but could be subsumed under the BTA criteria of physical properties and of consumers' tastes and habits.
[76] Irene McConnell, Casenote, *The Asbestos Case at the World Trade Organization: The Treatment of Public Health Regulations Under the General Agreement of Tariffs and Trade 1994 and the Agreement on Technical Barriers to Trade*, 10 TULSA J. COMP. & INT'L L., 176 (2002).
[77] *Asbestos*, *supra* note 60, at ¶ 114.
[78] Laura Yavitz, *The World Trade Organization Appellate Body Report, European Communities—Measures Affecting Asbestos and Asbestos-Containing Products, Mar. 12, 2001, WT/DS135/AB/R*, 11 MINN. J. GLOBAL TRADE 13, 60-61 (2002).

¶21 The Appellate Body further criticized the Panel for declining to make any findings relating to the third criteria, consumer's tastes and habits on the grounds that it would not provide clear results.[79] The Appellate Body reiterated the need to provide a complete analysis of the BTA criteria and emphasized the importance of this criterion in light of its finding that the physical properties of the products were different.[80] In particular, it considered that evidence relating to consumer tastes could establish that the health risks associated with chrysotile fibers influence consumer behavior towards the different products at issue, and hence provide a vital distinction between the two products.[81] Given the Appellate Body's emphasis on the competitive relationship between products, it is not surprising that it considers consumer preferences important since the latter will have a direct effect on the former.

¶22 But an examination of consumer tastes to determine the competitive relationship between products can be tricky. It is questionable if consumer preferences can accurately reflect consumer knowledge that a certain product alternative poses a risk to human health.[82] Very possibly, a supposed "preference" for one product over another could be a result of a government regulation rather than of free market forces. Where a government imposes a ban on a product, purportedly on the grounds of health risks that were generally not known to most consumers, the result is that the consumers have no choice but to seek an alternative product. Can it be then said that the consumer has voluntarily displayed an informed preference for the alternative, when in effect it is the government that has affirmatively restricted their choice? The Appellate Body has previously acknowledged the value of looking at foreign markets where there is no such regulation to observe if there is a competitive relationship between two products.[83] However, in such comparative studies, the other market must have "characteristics similar to the market at issue."[84] Thus, in a situation where there has been a ban or restriction on a product and there are no comparable markets to observe the free market forces at play, it is difficult to objectively gauge the true preference of the consumer if there was no such ban or restriction.

¶23 The Appellate Body did not consider the criterion of tariff classification due to a lack of evidence and analysis by the panel, which simply concluded was different for the two products and not decisive to the "like products" analysis.[85]

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[79] *Asbestos*, *supra* note 60, at ¶ 120.
[80] *Id*. at ¶ 121.
[81] *Id*. at ¶ 122.
[82] *See* McConnell, *supra* note 76, at 176-77 (arguing that consumer knowledge can be thin in a non idealized marketplace where there is asymmetric information).
[83] *See* Appellate Body Report, *Korea—Taxes on Alcoholic Beverages*, Jan. 18, 1999, WT/DS75/AB/R, WT/DS84/AB/R, ¶¶ 135-38.
[84] *Id*. at ¶ 137.
[85] *Id*. at ¶ 124.

From Asbestos to GMOs

¶24 An application of the BTA criteria to the GMO dispute will emphasize the first three criteria. The tariff classifications prong of analysis will not apply as the literature does not suggest that there are different tariff classifications for GMOs and conventional foods.[86]

Properties, Nature and Quality

¶25 The EU will argue that the deliberate alteration or introduction of new genetic material into GMOs is sufficient under the properties, nature and quality test for a finding that GMOs are not like their conventional counterparts. The EU can cite the *Asbestos* ruling that "molecular structure" is one way to distinguish products.[87] Although the US will argue that traditional plant breeding techniques already involve artificial selection of genetic traits, the more persuasive argument is that biotechnology allows for the manipulation of genetic material in ways that are not possible with traditional plant breeding, such as the production of transgenics.

¶26 However, a problem arises when one recognizes that even within any single species there exists natural genetic variation among members. Further, even though a crate of apples consists of fruit each of which possesses a slightly different genome, all the apples are considered "like products" within the meaning of GATT. Though it seems then that there is no way to achieve perfect likeness where biological products are concerned, the relevant issue, as articulated by Donald Regan, is whether there exist differences that are critical and important enough to distinguish the products under GATT.[88] *Asbestos* provides two weighty considerations to be used in this analysis. First, health risks may be a relevant factor in the physical characteristics analysis. In *Asbestos*, the molecular and chemical structures of chrysotile and PCG fibers were relevant because they contributed, as was scientifically established, to the carcinogenic properties of one product but not the other. While the EU can argue that the level of genetic manipulation in GMOs presents a strong case for finding different physical characteristics, it may be more difficult for it to show that such genetic differences pose a health risk since much of the science is still uncertain.

¶27 Second, the Appellate Body emphasized at the outset that a "like products" analysis using the BTA criteria must always be applied in light of the issue of market competitiveness and substitutability. The US will want to argue that only properties that affect market competitiveness should be relevant; since GMOs are cultivated for the very purpose of competing perfectly with conventional crops in the marketplace, any genetic difference is not relevant for the "like products" analysis. However, the EU could rebut by arguing that GMOs do not compete perfectly with conventional crops in the marketplace, as evidenced by the aversion

[86] *Id*.
[87] *Asbestos*, *supra* note 60, at ¶ 114
[88] Regan, *supra* note 68, at 447.

of GMOs by many EU consumers, although this argument will be more germane to an analysis of a consumer's taste and habits.

End-Uses

¶28 The end-uses prong of analysis more straightforward. Again, the US will argue that GMOs are produced precisely to replace the applications of those of their conventional counterparts, thus implying a perfect overlap of end-uses and a supporting a finding of likeness. The EU will objection the grounds that certain GMO applications extend to uses beyond those of conventional crops—drought-resistant GMOs can grown in drier areas where conventional agricultural products cannot; similarly, as discussed above, "golden rice" can provide nutrition in ways that conventional rice cannot. However, a more persuasive view is that these uses are improvements rather than differences, or at the most that they are differences in degree rather than kind, especially in light of the fact that the ultimate use of both GMOs and conventional foods is human consumption. Moreover, even if these "improvements" are categorized as "different end-uses," an examination of the total panoply of end-uses is likely to reveal that there are far more similar end-uses than different end-uses, which as noted above, would be sufficient to justify to the finding that the end-uses are similar.

Consumers' Tastes and Habits

¶29 At first blush, consumers' taste and habits provide the EU with a stronger argument; even the US acknowledges that EU consumers prefer not to buy GMOs.[89] EU may cite *Asbestos* and argue that such consumer preferences bring into question whether GMOs and conventional crops are truly competitive, because ultimately, it is the behavior of consumers in the marketplace that determines competitiveness and substitutability. However, as discussed above,[90] such application to the consumer's tastes prong of analysis is problematic. Because it would be extremely difficult for a panel to separate the effect of the existing moratorium on GMOs and assess the true consumer preference on GMOs vis-à-vis conventional foods, a panel may be compelled to examine a foreign market, with "characteristics similar to the market at issue" to ascertain consumer preferences. Outside of the EU, it would be difficult to find another transcontinental first world market like the EU other than the US itself. Given the looser regulation of GMOs in the US, an examination of consumer preferences in the US is likely to find that GMOs and conventional crops are indeed directly competitive.

¶30 Thus an analysis under the three relevant BTA criteria seems to favor the US position. Viewed under the lens of competitiveness and substitutability as mandated by *Asbestos*, and in the absence of any scientifically conclusive human health risk, the properties, nature and quality of GMOs are like those of conventional crops, as are their end-uses. Furthermore, a look at consumer tastes would, because of the

[89] INST. OF INT'L ECON. L., *supra* note 51. This explains why the US opposes any labeling measures as well.

existing EU moratorium, compel an examination of a representative external market, namely the US, and consequently the conclusion that GMOs and conventional foods are directly competitive. In light of the se three BTA criteria, a finding for likeness of GMOs and conventional crops is persuasive.

CONCLUSION

¶31 An analysis in light of *Asbestos* is likely to yield the conclusion that GMOs and conventional crops are "like products" for the purpose of GATT Article III:4. This conclusion points to a violation of Article III by the EU. However, the EU might still prevail through the Article XX, which provides enumerated exceptions which would uphold a trade measure despite an Article III violation,[91] or through an analysis under the SPS or TBT should a WTO panel deem those to the more appropriate regimes to rule on the case. Interestingly, this analytical exercise reveals the difficulties of applying the likeness criteria to biotechnology. The science of GMOs is poorly understood, and as yet, international trade law does not, with a few exceptions, seem to allow much room for precautionary action to guard against uncertain consequences that are not supported by scientific risk assessments. It is hoped that the Cartagena Protocol on Biosafety, laced with more explicit references to the precautionary principle, might represent a constructive step towards recognizing the heightened risk standards of consumer and environmentalist preferences in this sensitive area; however its limited scope,[92] and possible conflict with international trade law[93] leave many unanswered questions. The protocol for assessing likeness, and international trade law in general, might require additional tinkering to deal with new technologies such as biotechnology.

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[90] *See* discussion *infra* ¶ 21.

[91] *See, e.g.*, GATT, Art. XX(b) (allowing a trade measure to be enacted if it is "necessary to protect human, animal or plant life or health").

[92] *See* Murphy, *supra* note 12, at 77-78 (detailing the limited scope of the Biosafety Protocol).

[93] *See generally* Terence P. Stewart and David S. Johnson, *A Nexus of Trade and the Environment: The Relationship Between the Cartegena Protocol on Biosafety and the SPS Agreement of the World Trade Organization*, 14 COLO. J. INT'L ENVTL. L. & POL'Y 1 (2003); Brett Grosko, Note, *Genetic Engineering and International Law: Conflict or Harmony? An Analysis of the Biosafety Protocol, GATT, and the WTO Sanitary and Phytosanitary Agreement*, 20 VA. ENVTL. L.J. 295 (2001).