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Differing U.S. and European Perspectives on GMOs: Political, Economic and Cultural Issues

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This paper provides an overview of the historical and cultural factors that have contributed to divergent U.S. and European views on GMOs, and to resulting different national regulatory approaches for these products, specifically labelling policy. Within the context of the international trading system, these national policy choices will have impacts that will spill over national borders. Dialogue may be difficult to achieve, given widely divergent views concerning GMOs; however, without dialogue potential global social benefits of policy harmonization will be forfeited.

Keywords: biotechnology, culture, harmonization, labelling, trade

Introduction

Genetically Modified Organisms (GMOs) burst onto the scene in 1996 with the rapid commercial introduction in the United States of genetically engineered corn (maize), cotton, and soybeans. By 1998, more than 500 genetically modified plant varieties were

available in the United States, accounting for 28 percent (2.57 million hectares) of the area planted to maize, soybeans and cotton. Argentina and Canada had each planted an additional 100,000 hectares to GMOs, and other countries (South Africa, Spain, France, Mexico, China, Australia, Brazil) had planted less than 100,000 hectares each (James, 1999). Perhaps more significant to consumers, these crops rapidly entered the supply chain for processed foods using corn, soybean, or cotton seed oils, with some estimating that between 70 and 100 percent of processed foods now contain GMOs (*The Economist*, 1999).

In response to this rapid expansion, countries have developed diverse regulatory approaches to the production, marketing and development of these products. The United States has been a particularly strong advocate for the biotechnology industry in terms of intellectual property protection and limited governmental regulatory oversight in production and marketing. In contrast, Europe has approached biotechnology with skepticism and has been slow to grant regulatory approval for new products. These differences, which grow out of variations in political, economic, and cultural characteristics, have raised challenges for trade, agricultural, and consumer policy.

The purpose of this paper is to examine the underlying factors that have contributed to divergent U.S. and European views on GMOs. After a brief overview of the historical and cultural differences dividing U.S. and EU attitudes, we focus primarily on consumer labelling strategies and international trade.

Historical and Cultural Differences

To our knowledge, no comprehensive assessment has been undertaken of the differences in U.S. and European technology policy in food and agriculture (for an impressionistic assessment, see Zechendorf, 1998). However, it is clear that since the Treaty of Rome the EU has taken a different approach to food policy and regulation. Here we suggest several differences in the U.S. and European approaches, some historical and some contemporary.

The deep roots of European and U.S. attitudes toward agricultural science and technology relate in part to C.P. Snow's distinction between humanistic and scientific culture (Snow, 1964). In the EU, food, seen through a humanistic and aesthetic lens, is part of what differentiates what is Germanic from Latin, and French from Italian or Iberian. Some of these distinctions fall down on close inspection, with the origins of French *haute cuisine* traceable to the influence of Italian, especially Florentine, court-cooking, or the large number of "European" foods which actually have origins in colonial expansion in the 16th, 17th and 18th centuries (Field, 1982). The potato and tomato, for example, were New World foods, brought to Europe without fanfare (and in the face of considerable suspicion) early in the colonial period. Many classic European seasonings such as nutmeg and pepper were

oriental in origin. Even so, these and other foods have created a rich tapestry of national and regional European dishes that clearly demarcate European food from foods in other parts of the world, notably the United States.

In the United States, while some regional variations in cookery exist, most food bears the stamp of European (and later Hispanic and Far Eastern) ethnicity. Examples include the French Creole cooking of Louisiana, the seafood stews of New England, the piquant foods of Texas and New Mexico, and the Germanic and Scandinavian meat and potatoes of the Upper Midwest. In general, Americans' perception of food is more utilitarian and less aesthetic than Europeans'. In contrast to a humanistic or aesthetic bias, Americans think of food in nutritional terms linked to science and sustenance, with quantity often preferred to quality.

A second difference in European and U.S. attitudes toward food relates to science itself. From the earliest enthusiasm of U.S. Founding Fathers such as Benjamin Franklin (influenced profoundly by his exposure to British and French enlightenment scientists), Americans have thought of themselves as both a democratic and scientific culture, with a special mission for human development and improvement. This was especially evident in the mechanical revolutions of the 19th century, when doubters and agnostics such as Nathaniel Hawthorne (see his *The Celestial Railroad*) were dominated by celebrants and technological optimists. Noble (1999) has noted that American technological optimism has deep roots in a Christian perception of a new and better world to follow the millennial reckoning predicted in the Book of Revelations. As Milton stated, nature "would surrender to man as its appointed governor, and his rule would extend from command of the earth and seas to dominion over the stars" (quoted in Noble, p. 48). Such technological optimism was supported in America by the Freemasons, who became technological evangelists. Benjamin Franklin, a lifelong Freemason active in the movement in America, England and France, and grand master of La Loge des Neuf Soeurs, was among the main evangelicals (Hans, 1953). His "Proposals Relating to the Education of Youth in Pennsylvania" led to the establishment of the Academy (later University) of Pennsylvania, and his precepts were followed by other Masons including De Witt Clinton, father of the Erie Canal, Stephen Van Rensselaer, founder of the first engineering school in America, and industrial inventor Robert Fulton (Noble, p. 79). All but a few signers of the Declaration of Independence were Freemasons. At the 1876 Exposition in Philadelphia, huge crowds gathered to stare in amazement and rapture at the giant Corliss engine, which had a presence and power that dominated descriptions of the event (Kasson, 1976).

In Europe, by contrast, the technological revolution of the 19th century was met by an aesthetic and cultural reaction to science and technology. The Arts and Crafts movement led by Morris and Ruskin in England, the Jugendstil in Germany, and the Romantic poetry of

France all signaled a revolt against mechanical and technological advance. In the hiatus before the First World War, the application of science and technology to armaments set the stage for the massive destruction of European cities and landscapes and the annihilation of millions of soldiers and civilians, confirming the nightmarish visions of technological pessimists.

America, by contrast, remained largely untouched by the First World War, and retained a sense of the possibilities of technology and science, particularly related to improvements in agriculture and food production. The number of tractors on American farms jumped from 1,000 in 1910 to 246,000 in 1920 (Cochrane, 1979). Herbert Hoover was elected President of the United States in 1928 largely on the strength of his record in charge of the U.S. Food Administration during the First World War. Luther Burbank and Henry Wallace (later Vice President) became folk heroes for their early work on hybrid horticultural and corn crops, respectively.

The application by Nazi Germany of scientific principles drawn from American Frederick Winslow Taylor's 1911 book, *Principles of Scientific Management* (the basis of Henry Ford's assembly line, thus "Fordism") led to the even more wholesale destruction of modern Europe in the Second World War. Taylor and his followers, using "time and motion" studies, inspired an efficiency craze in American culture. As Surowiecki (2000, p.50) notes:

Agriculture, schools, churches, homes, government—almost every area of life became a candidate for Taylorization. Progressives like Walter Hippmann argued that scientific management would help replace "drift" with "mastery." In 1914, sixty-nine thousand people attended an efficiency exposition in New York City. *Ladies Home Journal* ran a series on Taylorism in the household Soon, visionaries were telling us that Taylorist engineers held "the material welfare of all the advanced industrial peoples" in their hands.

Adolf Hitler, an admirer of Henry Ford's, and of Taylorism, took these ideas seriously. In the Nazi case, the assembly line was applied to the extermination and cremation of Jews, Gypsies, and the handicapped and disabled.

In the wake of World War II, Europe also confronted a food crisis. Unwilling to face the vagaries of the world market, the European Coal and Steel Community began to construct what would ultimately become, under the Treaty of Rome, a frankly protectionist policy which strove (all too successfully, it turned out) to guarantee self-sufficiency in basic foodstuffs. Scientific and technological progress in agriculture, much of it borrowed or imported from the United States, combined with guaranteed high prices to push European production possibilities upward dramatically.

Still, Europeans remained deeply ambivalent toward science and technology, and fiercely devoted to the aesthetic component of food and rural culture. Given the terrible his-

tory of Europe in the 20th century, it is unsurprising that when genetic engineering burst onto the agricultural scene in the 1990s, it should trigger European misgivings. The experience with Bovine Spongiform Encephalopathy (“Mad Cow Disease”) in England during the early 1990s also deepened European suspicion that government regulations were ineffective. Europe’s intellectual and media elites disdained the corporate capitalistic culture of America, and feared for European cultural sovereignty in the face of the juggernaut of American technology, now in the form of GMOs.

For all of the reasons noted above, the notion that regulatory differences over GMOs should be resolved by “sound science,” the position aggressively advocated by U.S. trade negotiators, sounded far less convincing to European ears. In part as a function of their own sense of cultural superiority, Europeans also remained surprisingly vague over the facts of genetic engineering, which sounded uncomfortably like eugenics. As Regazzi, Senauer and Kinsey (2000) note, nearly half (44 percent) of those surveyed in Germany and Austria thought that “ordinary tomatoes do not contain genes while genetically modified ones do,” compared with 10 percent of those surveyed in the United States. Yet the unattractive characteristics that European consumers attributed to GMOs clearly derived from the broad cultural and historical factors noted above.

Ultimately, the stance of the EU respecting GMOs reflects a non-scientific, even anti-scientific, sensibility. As Konrad Von Moltke (2000, p. 3) writes in a recent paper detailing the history and basis of the “precautionary principle”:

Scientific research is not designed to provide answers to questions of policy. It is a method to validate or invalidate hypotheses about natural phenomena, and only hypotheses susceptible to validation can form useful questions for scientific research. The questions policy makers typically ask are rarely appropriate for science.

Placed in this context, it is easier to appreciate the differences over regulatory policies toward GMOs. The European traditions of an aesthetic appreciation for food, a skepticism toward science wrought of destruction by military and Fascist technology, and a protection of domestic markets, stand in marked contrast to scientific and utilitarian attitudes toward food, a scientific optimism unscarred by war, and general support for free markets and trade in the United States.

In biotechnology, the historical American evangelical belief in science as saviour is also evident, and the connection to eugenics is rather disturbingly explicit. Molecular geneticist and biotechnology pioneer Robert Sinsheimer in 1969 declared that biotechnology would create “a new eugenics,” which would rise above the “old eugenics,” which “was limited to a numerical enhancement of the best of our existing gene pool The new eugenics would permit in principle the conversion of all the unfit to the highest genetic level” (Sinsheimer,

1969). More than 25 years later, as an enthusiast for the Human Genome Project, Sinsheimer described its significance:

From the time of the invention of writing, men have sought for a hidden tablet or papyrus on which would be inscribed the reason for our existence in this world How poetic that we now find the key inscribed in the nucleus of every cell of our body. Here in our genome is written in DNA letters the history, the evolution of our species ... when Galileo discovered that he could describe the motions of objects with simple mathematical formulas, he felt that he had discovered the language in which God created the universe. Today we might say that we have discovered the language in which God created life After three billion years, in our time we have come to this understanding, and all the future will be different (Sinsheimer, 1994, quoted in Noble pp. 189-190).

With this backdrop, we turn now to consider some specific issues of labelling policy, harmonization, and trade.

GMO Labelling Controversy in U.S.-European Trade

Because the United States and the EU have developed regulatory schemes for GMOs based on their unique national perspectives and divergent traditions, it is unsurprising that these have led in turn to international conflicts over GMO policy, particularly in international trade. Recently the United States and the EU have clashed over the validity of national labelling requirements on GMO agricultural products. The most controversial of proposed regulations would mandate segregation of GMOs from traditional crops, requiring labels on all seed products containing greater than a specified amount of GMO product. Although some consumer groups have criticized the lack of national GMO regulatory policies in the United States, the U.S. government continues to maintain that GMO corn is “substantially equivalent” to non-GMO corn, and should be traded freely along with it. U.S. producers have contended that labelling requirements would force industry to segregate crops at the field level and require monitoring of crop content along the chain of production from farmers to processors, costing billions of dollars. Hence many experts in the industry interpret the EU regulatory stance as a form of non-tariff trade barrier (NTB) (see discussion below). The EU maintains that these cost estimates are exaggerated, and that reasonable concerns about the safety of these organisms justify mandatory labelling of all agricultural products containing GMOs.

Although in general U.S. citizens are more favorably inclined towards GMOs than are EU citizens, a broad array of advocacy groups in both countries support labelling policies. Due to the rapid introduction of GMOs into the food supply, consumer advocates and a wide range of environmental and food safety groups have mounted an active labelling campaign. In response to these concerns, food distribution companies around the world have begun calling for segregation of GMOs from traditional crops and indicated their willing-

ness to avoid GMO products in their food marketing efforts. In May 1999, major food chains in England (Sainsbury, Tesco, Marks and Spencer, Burger King, McDonalds) announced their intention to avoid GMO ingredients. In Spain, Pryca, which had been the largest importer of soy-based GMOs and a producer of GMO corn, announced it would no longer use GMO ingredients in its branded products. The French food retailer Carrefour instituted a similar policy. In Switzerland, Nestlé announced a temporary halt on GMO product use, and Russia announced that after July 1, 1999, any imported GMO product would require testing and licensing (Kinsey, 1999). Most recently, U.S. food companies, including Archer Daniels Midland and ConAgra, have signaled their farmer suppliers of the possible future need to segregate GMO crops from conventional varieties, indicating the possibility of segregated product streams as well.

Numerous parties to the debate over GMOs have proposed labelling food products containing genetically modified material and/or segregating seeds or GMO products in supply streams allowing “identity-preserved” products. Labelling has particular appeal as a market-based alternative to those who believe that consumers, once informed of the presence of GMOs in food or seed, will choose to purchase (or not to purchase) them based on this information. Labels might, in fact, result wholly from voluntary decisions by firms to offer such information to consumers. However, for a variety of reasons, notably those of uniformity and coordination across both private firms and national regulatory regimes, it is probable that some international standards or norms will be necessary (Runge and Jackson, 2000).

A labelling strategy could either highlight GMO content or spotlight those products that do not contain GMOs. The first type of labelling, which we will call positive labelling, might involve the statement: “This product may contain GMOs.” Given the extent to which GMOs have already entered the food and fibre chain, such a label would convey relatively little information. In contrast to cigarette health warning labels, a simple indication of possible GMO content may imply risk but does not accurately reflect health consequences of consuming GMO products. Moreover, it is unclear from such a label how much GMO content is implied or whether the GMOs in question are specifically identified (as, for example, Bt corn or Round-Up Ready© soybeans).

Nonetheless, some advocates of positive labels assert that they would help steer consumers (or, in the case of seed, farmers) away from GMO products. Since this would now include the vast majority of processed food products (and a large share of the seed market) their motivation for positive labels may lie in a desire to reduce consumption of and trade in these products, and thus the revenues of their manufacturers, large or small. In addition, it is possible that the threat of such a label, or the label itself, would lead investments in research and marketing into GMOs and their products to wither and eventually to die. In

short, positive labels could impose costs on the agricultural industry without providing equivalent compensating benefits to consumers.

Before rejecting positive labels as purely destructive, however, we should note that positive labels may have certain advantages in the future that current efforts to limit trade in GMOs obscure. We may distinguish current, market-limiting labels, or “positive labels with negative intent,” from positive labels that may indicate an attractive nutritional or pharmaceutical property of a particular GMO food or seed, such as the vitamin-enhanced rice varieties now being promoted by the International Rice Research Institute (IRRI) (Ye et al., 2000). In these cases a “positive label with positive intent” would convey these attractive properties, potentially enlarging the market for the seed or food product.

In contrast, a negative label would read: “This product (or seed) contains no GMOs.” Such a label has certain requirements. One requirement is to define “no.” “No” would necessarily imply a minimum threshold approaching zero. Once agreement on such a threshold is reached, it would need to apply across firms and national boundaries. Another requirement would be to carefully define “GMO,” so that only “transgenics” in which some form of gene “splicing” had occurred would be included. Assuming such agreement could be reached, the effect of such a label would be to create niche markets for those choosing to purchase, process, segregate and sell no-GMO food or seed products. Each action will likely entail additional costs or effort at some point in the food or seed supply chain. In the case of food products, purchasing no-GMO ingredients will entail monitoring inputs closely and requiring farmers and suppliers to conform to no-GMO practices. Processing would need to be in separate lots, or even separate facilities, to guarantee against co-mingling. In the case of seed, similar restrictions would apply to growing, processing, segregating, and selling no-GMO varieties. Assuming these extra costs are not prohibitive, firms will bear them if the market for no-GMO products or seed is perceived to be large enough and the price elasticity of demand adequate to support product or seed prices sufficient to cover the variable costs of production.

This type of labelling strategy would have advantages. There is already evidence that such markets are perceived to be worth the effort required to segregate product and processing methods. Apart from the examples of large food companies noted above, several less visible instances suggest the emergence of market opportunity for products carrying a no-GMO identity. Natural Products Inc., a Grinnell, Iowa company that processes unmodified soybeans (sold to Ben and Jerry’s Homemade Inc. for use in its ice cream products), expects sales to triple in 2000 to about \$10 million. The Hain Food Group of Uniondale, New York, is labelling its organic snacks as nonbiotech. Hain’s method, for the moment, is to switch from frying the snacks in corn oil to safflower oil, which has not yet been genetically engineered (Kilman, 1999). Among the most active producers of no-GMO products

is American Growers Foods, of Embarrass, Minnesota. The company promotes its foods as chemical and GMO free. It independently tests and certifies a variety of breakfast cereals, snack foods, and baked goods as organically grown and containing no GMOs.

In summary, governments and the private sector will likely need to respond to calls for the labelling of foods and seeds. A system is therefore needed that could effectively use and develop GM technologies while allowing consumers to reject them if they wish. A Canadian survey of eight countries found significant variation in consumer attitudes. For example, although 68 percent of all respondents said they would be less likely to buy groceries labelled as GM products, national responses ranged from a low of 57 percent in the United States to 82 percent in Germany (see Hoban, 1999). But the combination of consumer choice with freer trade would remove the chance that the GM issue could be exploited for protectionist purposes; consumers could choose between GM food and organic products without resorting to trade discrimination. As Alexander Haslberger, a leading European expert on biotechnology, noted in a recent contribution to *Science*, the significant public opposition to GM food will require that the industry adopt honest and appropriate labelling if it wants to avoid consumer resistance (Haslberger, 2000). One possible multi-lateral response could be to harmonize differing national standards under the purview of the new Biosafety Protocol or the UN Food and Agricultural Organization's Codex Alimentarius (Runge and Senauer, 2000).

The Montreal talks in January 2000, when more than 130 countries agreed on the Biosafety Protocol to the Convention on Biological Diversity, were a good start. The protocol discusses the environmental risks and benefits in biotechnology and creates a framework to protect biodiversity in developing countries. But many unanswered questions remain. Most prominent is whether the new protocol will allow a protectionist loophole for a "precautionary principle" that bars GM-food trade even if scientific evidence of harm is insufficient. Another central issue is the balance between trade restrictions justified on environmental or health grounds and the larger obligations of nations to trade without discrimination under the WTO.

Trade and Harmonization

As described in the previous section, labelling strategies include various policy options that would provide consumers with information about GMO content in their foods. Each of these options would create costs for agricultural producers and processors, while some of them might allow producers and processors to capture a price premium for segregated products. If these were the only costs associated with labelling policies, national policy makers could simply weigh the costs and benefits to their national constituents and choose an appropriate strategy. However, in this case, the United States and the EU are

choosing their labelling policies within a system of international trading relationships. Hence the potential costs associated with national policy choices spill over national borders.

Labelling policies have become a contentious policy issue between Europe and the United States because labelling will have potentially large trade-distorting effects. If labelling strategies implicitly define content standards for products containing GMOs then labels may act as non-tariff barriers, inhibiting U.S. products from entering the European market. However, if national labelling strategies converged towards similar standards, then the non-tariff barrier effects would be minimal. Policy harmonization, in short, would help to ensure the least distortion to trade, but will be difficult to achieve (Caswell, 2000).

The U.S.-EU trading relationship is defined within the context of rules and commitments established by the World Trade Organization (WTO). The WTO establishes reciprocal relationships among countries so that they are obligated to follow jointly accepted institutional norms for justifying their non-tariff restrictions. While in general the WTO advocates the removal of trade barriers to achieve broad societal benefits of free trade, the institution also acknowledges through agreements such as the Agreement on the Application of Sanitary and Phyto-sanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT) that nations have the right to establish national regulatory systems that insure a safe food supply and protect the domestic environment from pests and diseases. Nevertheless, in order for mandated crop segregation and labelling policies to be justified as health and safety measures, the WTO requires that these policies be based on generally accepted scientific criteria.

The SPS and the TBT state that national regulations that act as non-tariff barriers are acceptable if they conform with formally recognized international standards, guidelines, and recommendations, including the Codex Alimentarius.¹ These recommendations are used as benchmarks against which national food measures and regulations are evaluated within the legal parameters of the SPS and TBT agreements. Thus, they contribute to facilitation of international trade and resolution of trade disputes in international law.

The Codex Alimentarius provides one mechanism by which to judge the justifiability of national food safety standards. However, the concern over GMO crops and their introduction into the environment is also related to the potential environmental impacts of these crops. Because the long-term environmental consequences of using these genetically modified products are uncertain, scientific consensus over the risks associated with their production has not emerged. Scientists continue to debate these issues, and the controversy surrounding these regulations remains highly politicized. As Roberts (1998) notes in an evaluation of the SPS:

Regulations rationalized on technical grounds seem to lack firm scientific foundations and, at least from the perspective of exporting countries, seem to be imposed primarily to thwart the commercial opportunities created by other trade liberalization policies.

Unfortunately, no simple mechanism exists for uncovering the underlying motives for policy choices.

The United States and Europe differ in their regulatory approaches to managing environmental risk. European regulation, particularly in the environmental areas, is influenced by the precautionary principle. The precautionary principle states that in areas where science is limited and outcomes are unpredictable, regulatory authorities are justified in taking action to avoid possible negative outcomes. In relation to the case of GMO labelling, the EU policy stance is that GMOs are new goods, not extensions of their natural counterparts, thus policy makers are obliged not to approve products for release until they are shown not to pose a danger to human or environmental health. The United States, on the other hand, treats GMO products as extensions of existing products, which means these products must satisfy simply the same safety requirements as their natural counterparts. Thus, the United States does not agree with the application of the precautionary principle in this area, and perceives the EU policy makers as succumbing to interest group pressure (Perdikis, 2000).

Adding to the confusion about potential harmonization of labelling strategies, some experts maintain that the labelling controversy does not fall within the scope of the SPS or TBT agreements. Rather, they argue, it is based on a fundamental right of consumers to know the content of their food. Current WTO agreements have not addressed the possibility that consumer interest may represent an alternative, and equally valid, justification for regulations that have trade-inhibiting impacts.

Harmonization of labelling strategies would facilitate trade and contractual relationships by ensuring that importers and exporters face similar economic conditions. However, harmonization could also impede trade by requiring compliance at levels that impose differential costs and burdens on importers or exporters. These costs and benefits are difficult to determine without access to specific producer cost information. Therefore, even relatively unbiased national policy makers may ultimately be swayed by the political pressure within their countries for or against labelling.

Disaggregating the effects of labelling requirements on national level costs and benefits suggests a credible political explanation for the current controversy over legitimacy of labelling. Consider a compromise to harmonize around a labelling strategy, requiring that Europe drop its standards for segregating GMOs, but also requiring the United States to raise its labelling requirements. In Europe, producer surplus initially falls as competitive

U.S. exports of GMO oilseeds and feedgrains enter the European market, less impeded by EU standards. However, European producers gain access and the ability to produce GMOs themselves, quickly regaining a competitive edge. Consumer surplus increases with less expensive food, but may fall if consumers fear GMOs as a form of health or environmental risk. Hence the EU stance on the proposed labelling harmonization depends on the perceived competitiveness effects on producers and the perceived risks to consumers. In the United States, raised labelling requirements may raise costs and reduce producer surplus, but these costs are offset by expanded market access to the EU. Consumers gain if the labelling requirements increase the perception of food safety and do not appreciably affect food costs.

The future of the GMO labelling controversy is unclear. Within the context of the institutional obligations defined by the WTO, the United States and EU may be willing to deviate from their optimal divergent strategies. However, until the WTO formally addresses this issue the definition of acceptable environmental and health risks and the consumer right-to-know issue will challenge existing WTO structures and will continue to act as stumbling blocks to U.S.-EU labelling policy harmonization.

Conclusion

The EU and the United States would benefit from a constructive dialogue over labelling policies and harmonization. If they continue to disagree and choose widely divergent strategies, the impacts on international agricultural trade, as well as on the biotechnology industry, will be immediate and large. In addition, a continued impasse in this area threatens to stall the development of new biotechnology products that offer significant global health benefits in the future. Although the WTO has not explicitly stated how it would address a trade dispute over labelling as a non-tariff barrier, such a dispute would certainly be costly for both countries in terms of resources and time. A more productive approach would be for the two to begin a dialogue about labelling options, including negative labelling, in order to develop a mutual understanding of the potential international benefits and costs associated with divergent and harmonized policies. Although such a constructive dialogue may be difficult to achieve in the context of widely divergent views concerning GMOs, without this type of dialogue potential global social benefits of harmonization will be forfeited. However, such a discussion must proceed with due recognition of the cultural differences in attitudes toward food and its role in national life and identity, and an appreciation for the evangelical zeal with which American science and industry approach technological change.

Endnotes

1. The Codex Alimentarius was established in May 1963 when the Sixteenth World Health Assembly approved the establishment of the Joint FAO/WHO Food Standards Programme and adopted the statutes of the Codex Alimentarius Commission. The Codex Alimentarius system is based upon the ideal that countries should come together to set mutually agreed upon food standards and to ensure the global implementation of and compliance with these standards.

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