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NAFTA and the Food and Agricultural Industries

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Synonyms

Economic integration; NAFTA; National food regulation

Introduction

The North American Free Trade Agreement (NAFTA) took effect on January 1, 1994. Ethical controversies arising from NAFTA policies, rules, and procedures reflect its character as more than a regional trade agreement designed to lower barriers to trade across US, Canadian, and Mexican borders. It offers far-reaching guarantees to the rights of foreign investors across NAFTA member state borders, including rigorous protection of intellectual property rights – exceeding World Trade Organization (WTO) standards. In particular, NAFTA prohibitions and sanctions against a variety of "nontariff barriers" have raised ethical concerns about a threat to national sovereignty and democratic control in promulgating and enforcing domestic health and environmental regulations, including food safety standards.

Ethical concerns raised by NAFTA may best be framed as a failure of "moral imagination," which Patricia Werhane (1999) defines as "the ability to perceive that a web of competing economic relationships is, at the same time a web of moral relationships" (p. 5). From this absence of moral imagination arises the all too common phenomenon of "moral amnesia," which Werhane defines as "an inability to remember or learn from one's own and others' past mistakes and to transfer that knowledge when fresh challenges arise" (p. 7). As a consequence, "mental maps" or "cognitive scripts" that shape business decisions within the narrow confines of economic "rationality" tend to prompt a "setting aside of moral considerations in the pace of business activities" (p. 11).

Moral Amnesia and the Paradox of Globalization

This absence of moral imagination is suggested by Dani Rodrik (2011), a Harvard political economist, when he notes a "globalization paradox" whereby aggressive and inflexible extension of international free trade theory, embodied in a push for "*hyper-globalization*," places constraints upon a nation's sovereign jurisdiction and democratic traditions. Such traditions sanction political intervention to buffer the negative impacts of economic forces or business activities upon social or environmental stakeholders.

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International trade economists and lawyers point to the hypothetical benefits of *unrestricted* global market production and exchange choices. This theory holds that regions, nations, and firms will prosper to the extent that their productive activities leverage a "comparative advantage," grounded in favorable mix of "factor endowments." Since factor proportions of labor, capital, and natural resources are assumed to be relatively static or fixed over time, it follows that entrepreneurs who engage in productive activities at locations with an optimal mix of factors will create opportunities for mutually advantageous specialization and exchange. When productive knowledge is included as a more dynamic or developmental factor, international intellectual property guarantees via patent, copyright, trademark, and trade secret protection provide corporations with incentives to develop and extend their "firm-specific advantage" across national boundaries (Smallson 1994). The favorable global and local welfare implications of international trade and production are said to reap "gains from trade" that are baked into the culinary metaphor of a "growing economic pie" and in the benign seagoing vision of a "rising tide that lifts all boats." Rodrik questions the rigidity of this neoliberal trade policy formulation, pointing instead to the possibility of a more flexible international trade regime in which the hyper-globalization narrative is balanced by a regard for the legitimacy of national sovereignty concerns and the need for democratic oversight of the social and environmental impacts of international trade rules. This essay will adopt the complementary frames of analysis of Werhane and Rodrik with regard to the ethics of food policy within the NAFTA policy regime.

Tom Friedman's Neoliberal Recipe for "Hyper-Globalization"

By way of contrast, Tom Friedman (2000) in his best-selling paean to neoliberal orthodoxy, *The Lexus and the Olive Tree*, captures and strives to resolve the paradoxical tensions within the globalization narrative. The Lexus epitomizes the technological and material benefits of globalization, whereas the olive tree suggests the persistent appeal of local rootedness in culture, ethnicity, and a sense of place. Friedman stipulates the "golden rules" that frame the *golden straightjacket*. He insists that nations have no choice but to do this constraining garment, if they are to reap the alchemic benefits of "winner takes all" stardom on the "flat world" stage. He deems the straightjacket of a "free market" policy regime to be mandatory, since national "flexibility" in the application of golden rules would dim the stellar sheen of their global finery. This neoliberal nostrum of policy measures, also known as the "Washington Consensus," stipulates that countries desirous of going global must remove cross border restrictions on trade and capital flows, privatize state-owned firms, rigorously pare back government regulations and social or industry subsidies that balloon government budget deficits, raise inflationary pressures against currency stability and convertibility, and stifle the "creative destruction" of capitalist innovation. When negotiating trade agreements, international trade experts decry calls for consideration of environmental, labor, or other human rights concerns on the grounds that environmental or social policy "side agreements" merely "muddy the waters" in striving for a "clean" economic trade pact.

In Tom Friedman's globalization narrative, the *electronic herd* of long- and short-term investors is anointed as the bullish driver of global growth, spreading gold wherever nations and their denizens don their straightjackets like good global citizens. In the new sartorial era where "one size fits all," Friedman finds a world where "your economy grows and your politics shrinks" (2000, p. 105). Policy initiatives are reduced to the choice between Coke and Pepsi as politicians exercise their "synchronized swimming" skills (p. 107). The threat of capital flight (stampede) out of countries that grossly violate the golden rules, or even a refusal by the electronic herd to graze in less inviting pastures, is taken to be a formidable deterrent to removing or adjusting the golden straightjacket.

NAFTA trade courts have supported this hyper-globalization agenda by offering

extraordinary reinforcement of the rights of capital enjoyed by the electronic herd within NAFTA via Chapter 11 trade courts. These tribunals provide oversight of national or local regulations that may threaten foreign investment profits in a manner considered "tantamount to expropriation." They also have worked to "harmonize" member state regulation of environmental, food safety, and other health hazards that proponents of hyper-globalization challenge as potentially excessive and surreptitious nontariff barriers to international trade and investment.

NAFTA's Chapter 11 Trade Court Protection of the Rights of Foreign Investors

NAFTA trade tribunals are designed to arbitrate private contractual disputes, even though Chapter 11 cases raise significant public policy concerns. NAFTA trade panels have held that "incidental interference" with the property rights of a foreign investor may constitute a "regulatory taking" that is "tantamount to expropriation." In one celebrated case, a US firm, Metalclad, acquired a Mexican property that had been used previously as a hazardous waste dump. The local Mexican government refused to issue a construction permit until Metalclad had addressed local concerns about heightened cancer and birth defect rates by remediating a legacy of air and water pollution violations. Metalclad refused to agree to such remediation. The provincial government supported the local government stand by creating an ecological preserve at and around the waste site. Metalclad filed a Chapter 11 complaint and asked for $90 million in damages from the Mexican federal government. The NAFTA trade court awarded Metalclad $15.7 million in damages on the grounds that the Mexican government had violated the "minimum standard of treatment" guaranteed to foreign investors within NAFTA member states. The award was subsequently reduced by $1 million on procedural grounds (Public Citizen 2012).

In a similar case in California, a state regulatory agency banned the gasoline additive, MTBE (methyl tert-butyl ether), on the grounds that it had been determined to be carcinogenic under very low levels of contamination, if treated fuel leaked into the groundwater. A Canadian company, Methanex, sued the US government on the grounds that this state regulation was "tantamount to expropriation" in that it precluded potential profits from sale of the banned fuel additive. Even though this complaint was dismissed on procedural grounds, it still reveals an unresolved jurisdictional conflict between NAFTA trade courts and US (and other member state) legal systems. Article III of the US Constitution creates a federal judicial system. To preserve judicial independence, the Constitution holds that Congress cannot delegate the "essential attributes" of the judiciary. Yet it appears that this is what Congress did in creating the NAFTA trade court mechanism. The US Supreme Court has held that government regulations to protect the public interest do not constitute a regulatory taking if there is "incidental interference" with the rights of property owners to pursue profits (such as draining protected wetlands to grow crops). Yet this is precisely what NAFTA trade tribunals have asserted – and Chapter 11 rulings are not subject to appeal or oversight by the federal court system. US government agencies enjoy the right of "sovereign immunity" against lawsuits by its own citizens. However, the shield of sovereign immunity is notably absent in the case of potential damage claims by foreign investors in Chapter 11 trade courts. Successful Chapter 11 claims and settlements are still relatively modest at 35 million dollars as of 2007. However outstanding Chapter 11 claims amount to billions of dollars. Ultimately, US (or Canadian and Mexican) taxpayers are vulnerable to huge damage claims if this jurisdictional anomaly is not resolved in a way that restores national sovereignty and democratic control.

Moreover, the practice of resolving these investor claims and other trade disputes behind closed doors, without the right of interested persons to testify, submit amicus briefs, or become a party to the suit is troubling, to say the least. Even the threat of a Chapter 11 complaint can chill public interest legislation. This was the case

when the Canadian government withdrew proposed tougher warnings on tobacco ads, when threatened by a Chapter 11 claim by US tobacco interests. In a parallel case, the provincial government of New Brunswick in Canada dropped its proposal to offer low-cost public auto insurance after being threatened by a Chapter 11 claim by US auto insurance companies.

NAFTA's Downward Harmonization of Regulatory Standards

Harmonization of regulatory standards across national or local jurisdictions within NAFTA is intended to minimize anomalies that may create "nontariff barriers to trade." Since US federal and state regulatory standards tend to be more stringent than those of Canada or especially of Mexico, the outcome of harmonization is growing downward pressure on US regulatory standards. Moreover, NAFTA standards are presumed to be equivalent to international World Trade Organization (WTO) standards. Consistent with the hyperglobalization preference for resolution of trade disputes via secret adjudication by technical experts (letting economics grow and politics shrink), international regulatory standards are promulgated by secret trade panels of technical "experts." Since industry spokespersons can pose as "expert witnesses" to these panels, while public voices and outside scrutiny of secret testimony are denied, regulatory standards tend to be industry friendly and therefore less stringent in safeguarding against environmental or public health hazards. NAFTA decrees that food safety standards must be based on "scientific principles" and subject to risk assessments. Since there is little consistency among US food safety standards promulgated in different jurisdictions and over different time periods, US food regulations pertaining to exposure to pesticides, food additives, microbial contamination, and food irradiation are subject to trade dispute challenges by importers of foodstuffs, opening the way to serious dilution of inspection standards and procedures. Thus, an absolute ban of a pesticide such as DDT could be challenged on the grounds that permitting trace amounts of the chemical would provide reasonable protection with minimal risk.

While harmonizing downward regulatory goals, NAFTA trade dispute resolution tribunals have also limited the means for achieving regulatory ends. NAFTA and the preceding US-Canada Free Trade Agreement require that signatory states allow imports subject to different but "equivalent" standards and inspection processes. Adopting this guideline, the United States stopped inspecting Canadian meat at the border for listeria contamination, accepting as equivalent a Canadian inspection of meat-packing operations more generally. Critics charged that these food safety regimes were not equivalent, since the rejection rate for Canadian meat imports dropped by half after the end of border inspections. NAFTA pressure to harmonize regulatory processes also poses a threat to the more stringent US inspection of Mexican fruits and vegetable imports, which tend to have higher residues of DDT and other pesticides (Goldman 1993, p. 4).

NAFTA does not allow import restrictions based on the adverse effect of a production process upon claims of environmental or health damage. A trade dispute brought by Mexico to WTO trade courts illustrates the potential ill effects of potential future NAFTA trade court rulings. The Mexican government charged in 2008 that US legislative and judicial rulings establishing the basis for restricting importation of tuna to those caught via "dolphin safe" means constituted a nontariff barrier to trade. A WTO appeals panel found that a US ban on Mexican tuna fishing practices which targeted areas in which dolphins were present discriminates against Mexican tuna exports to the United States. Such alleged discrimination was based on the WTO panel's finding that the US dolphin-safe law was "not even-handed in the manner in which it addresses the risks to dolphins arising from different fishing techniques in different areas of the ocean" (WTO Dispute Settlement DS 381, 12 October 2012, p. 4). The perverse "logic" of such technical harmonization by a WTO (or potentially a NAFTA) trade panel undermines democratic control over national or local regulatory processes. It also undermines public policy

efforts to preserve the global commons or endangered species. The adverse environmental and human impact of NAFTA rules on Mexican corn growers is another case in point.

NAFTA and Mexican Corn Farming

The NAFTA theory of comparative advantage justifies scaling back and eventual elimination of tariffs on protected Mexican maize production on the grounds that free trade conditions will create competitive pressures that reallocate human and natural resources toward their "highest and best use." As productive resources shift toward different economic sectors that can gain advantage from more favorable factor proportions, free trade theorists argue that Mexico's international trade competitiveness will improve. Developments on the ground suggest otherwise. Prior to the ending of protection for Mexican maize, three million small family farms (averaging five family members each) were occupied in maize production. Thus, 15 million peasant farmers and 7 million others engaged in transporting, distributing, and processing maize products were employed in this sector. NAFTA trade rules forced two million maize workers off of the land. Although one-quarter of Mexicans live in the countryside, they account for 44 % of migrants to the United States. Most of the more mobile farmworkers were young men who sought their fortunes via illegal immigration north of the border. All too often, they sought their fortune in the illicit drug trade. Alternative jobs in seasonable vegetable and tropical fruit crop production failed to absorb many of the displaced farmers. The promise of growing labor-intensive manufacturing employment failed to materialize as domestic import substitution manufacturing jobs dried up and foreign investors tended to import components from abroad to take advantage of low-cost assembly in Mexico. When China joined the WTO in 1998, Mexico lost its labor cost advantage and the bulk of labor-intensive assembly operations of the electronic herd shifted to Asia (Malkin 2009, pp. 1–3).

Ironically, as US corn imports to Mexico have risen from 7 % of Mexican consumption in 1994 to 34 % of consumption in 2011, the incidence of malnutrition in Mexico has risen sharply (Carlsen 2011, pp. 1–2). The bulk of these US corn imports have gone to agribusiness animal feed operations and to cornstarch production. Small family farms in Mexico are being displaced by the rise of large-scale government-subsidized agribusinesses in Mexico, as well as by surging US corn imports, which also benefit from substantial US government farm commodity subsidies. Such indirect government export subsidies of farm products from the United States and Europe have been challenged by developing countries in WTO trade talks, but to no avail. Thus, NAFTA trade rules have reinforced the "corporatization" of agriculture in the United States as well as Mexico. Corn production has actually increased in Mexico since NAFTA came into effect, but at the expense of small farm displacement and to the advantage of large corporate farms and food processors. This has had the effect of sharply increasing income inequality in Mexico while sapping the vitality of rural life as small farmers retreat to subsistence. Small family farmers cannot afford the expensive hybridized, often genetically modified, corn seed imports from the United States. Such seeds require more water, fertilizer, and pesticides in order to increase yields. Large agribusiness firms grow as small family farms are pushed to the margins (Johnson 2011, pp. 1–2).

The consequences for Mexico's biological commons are also disturbing. US importation and planting of genetically modified seeds in Mexico are threatening the ancestral biological home of maize. Fifty-nine distinct cultivars of maize have been developed by indigenous farmers over millennia to adapt to different climatic conditions and cultural practices. The genetic diversity of these maize cultivars offers a robust biological defense against climate change or other ecological shocks. By way of contrast, the US factory farming practice of monoculture reduces food stocks to the status of a biological machine to be manipulated by chemical fertilizers, pesticides, and even genetically

engineered traits, such as pest resistance, to enhance agricultural "productivity." Advocates of a more holistic and organic alternative model of food production point to the externality costs of factory farming methods, such as massive nonpoint pollution of the air and water commons, and the fragility of a monoculture food production model that depends on massive infusions of petroleum-based energy and chemical boosters to survive. Quite apart from the long-term threat to biological diversity posed by factory farming methods, a sharp rise in petroleum costs could undermine its economic viability over the short to medium term (Bollier 2010, pp. 1–2).

The point here is that NAFTA trade rules that focus on removing tariff and nontariff barriers to trade have seriously missed the boat in Mexico. Not all boats are rising and the economic pie, to the extent that it is growing, is being divided in ever more unequal slices. The social and environmental costs of NAFTA free trade policies are being ignored by a policy regime that exhibits moral amnesia by simply assuming hypothetical welfare benefits of hyper-globalization. A related form of moral amnesia (the inability to recognize the moral implications of economic decisions or actions) may be seen in NAFTA protection of intellectual property rights, a dynamic factor of production.

Ethical Implications of NAFTA's Intellectual Property Rights Regime: The Mexican Yellow Bean Case

NAFTA was the first trade agreement to incorporate legal protection of intellectual property (IP) rights (see Smallson 1994). NAFTA's Chapter 17 establishes minimum standards of intellectual property protection among member states, requires effective enforcement of IP rights at the borders of NAFTA states, and establishes a dispute resolution procedure with trade-related sanctions and in some cases damages, payable to IP holders if their rights are infringed. The intended effect is to reward innovation and promote economic development by harmonizing IP protection mechanisms across Mexico, Canada, and the United States. Such IP safeguards would seem to be consistent with free trade principles of market access and nondiscrimination (Terry et al. 2005). However, ethical concerns arise if patent claims are placed on life forms that previously existed as a customary public good in a biological commons. Hence the growing controversy over corporate efforts to privatize the biological commons by patenting life forms, Critics have characterized this practice as "biopiracy." This practice is especially prevalent in developing countries where private property rights are not well defined and where rich biological diversity and a wide range of customary practices in agriculture and medicine create opportunities for privatization of corporate "inventions." Many poor farmers in developing countries are finding that they are required to pay licensing fees to grow crops native to their regions because large biotechnology and seed companies have patented their seed stock.

A notorious instance of such alleged biopiracy via the patent process is the Mexican yellow bean case. In the early 1990s, an American citizen, Larry Proctor, bought some yellow beans in a Mexican market, brought them back to Colorado, and crossbred them for several years to develop a variety which he claimed was patentable because of its more pronounced yellow color. He filed a patent for this "Enola bean" in 1996. The US Patent Office granted him a patent in 1999. This patent granted Proctor's seed company, POD-NERS LLC, an exclusive monopoly on yellow bean production and sale in the United States and potentially in Mexico and Canada as well. Exports of yellow beans from Mexico into the United States were immediately banned unless Proctor's company was paid a licensing fee of six cents per pound.

The ethical (and legal) absurdity of this case is highlighted by the fact that the Enola bean was derived from Mexican seed stock and that yellow beans had been produced and sold for generations in Mexico. In 2001, the Spanish-based International Center for Tropical Agriculture (CIAT), whose mission is to catalog and preserve plant cultivars to maintain global and local biodiversity, legally challenged the Ebola patent on the

grounds that it failed to meet the US Patent Office's requirement that an invention should be novel, have utility, and be nonobvious. In support, a charitable NGO, ActionAid, filed a patent on chips (as in "fish and chips") to highlight the absurdity of the Enola bean patent claim (Rattray, 2002). In December 2005, the US Patent Office rejected the Enola bean patent claim. However, Proctor appealed that decision and his appeal was rejected on April 30, 2008 (Wilson 2008).

While this common sense outcome suggests that misapplication of intellectual property laws can be remedied in the end, the lengthy process of review of the Enola patent claim seriously disrupted yellow bean exports from Mexico over a number of years. It also raised legitimate fears that rigorous enforcement of intellectual property rights could spur corporate profit making as much as real innovation. Privatization of the biological commons continues, typically without compensation to the traditional medicinal and agricultural practitioners who first developed or formulated the innovative use of life forms. Questionable and potentially unethical practices associated with privatization of life forms continue – such as the creation of "terminator seeds" that will not germinate after the first planting, so as to preserve sales of patented seeds. The use of "gene police" by seed companies such as Monsanto to prosecute or seek compensation from farmers whose crops have been pollinated by winds blowing over genetically modified food crops seems perverse as well. The grain growers of Alberta, as well as the maize growers of Mexico and organic farmers in the United States, feel justifiably threatened by this perverse form of enforcement of intellectual property claims.

NAFTA and Intellectual Property Controversies in the Pharmaceutical Industry

Efforts to control "gray market" imports to the United States of pharmaceutical products from Canada illustrate a curious interaction between Chapters 11 and 17 of the NAFTA treaty. Chapter 11 empowers foreign investors to claim damages from sovereign states that impose regulations that indirectly limit profits in a manner deemed "tantamount to expropriation." Canadian medical care is provided, at least in part, as a public good available to all Canadian citizens. Hence, the Canadian government has taken steps to control the price of patented drugs that are formulated, often by US-owned subsidiaries in Canada, and sometimes made in the United States and exported to Canada. Whereas prescription drugs are sold at "market prices" in the United States, the Canadian government imposes price controls, administered by the Patented Medicine Prices Review Board. Prices for the same drug may be 50 % lower in Canada than in the United States. As a result, a robust trade in prescription drugs has sprung up as Canadian internet pharmacies have responded to burgeoning US demand. In 2003, the value of this trade was estimated to be as high as $1 billion. An unresolved intellectual property issue is whether patented drugs either made in the United States and exported to Canada or manufactured under license in Canada can be reexported to the United States without violating the US patent. Canadian federal and provincial governments do not legally sanction these internet pharmacy exports, but they have taken no steps to curb them. Thus, the Canadian governments appear vulnerable to a potential Chapter 11 lawsuit seeking damages for loss of profits due to their failure to enforce patent protections guaranteed under Chapter 17 of the NAFTA treaty. Canada is also vulnerable to an unfair trade practices claim because it does not force Canadian generic drug manufacturers to independently verify the safety and efficacy of their formulation, relying instead on the certification of the original patented drug. A Chapter 11 claim by US pharmaceutical companies against Canadian price controls of patented drugs is even conceivable. If internet sales of prescription drugs from Canada to the United States were legalized, as has been proposed occasionally as a cost-saving measure, both the US and Canadian governments would be vulnerable to a challenge of "unequal treatment" of Mexican pharmaceutical firms (Terry et al. 2005). Harmonization of intellectual property standards to eliminate

alleged nontariff barriers to trade can become a double-edged sword that cuts in strange ways.

Conclusion

The above discussion has demonstrated that NAFTA efforts to harmonize regulatory standards to minimize alleged "nontariff barriers to trade" can have perverse and possibly unanticipated effects. In particular, the hyper-globalization narrative that underpins NAFTA policy initiatives is unsympathetic to the claims of public health and environmental damage inflicted by the public policy constraints imposed by the golden straightjacket. Ironically, the golden straightjacket is not so much antiregulatory as it is regulatory in favor public policies that reinforce the rights of global capital (the electronic herd) and the single-bottom-line thrust of global corporations. The unequal, and certainly unfair, distribution of the costs and benefits of globalization lies at the heart of the controversy over the NAFTA and the ethics of food policy. When the stakeholders of global capitalism try to mobilize and exercise their democratic rights to call upon the power of the state to temper the social or environmental costs of a narrowly defined economic agenda, they are scolded by the apologists of hyper-globalization on the grounds that their democratic impulse is irrational, counterproductive, and likely futile as well. The result is a kind of "moral amnesia" (Werhane 1999) that seeks to marginalize calls for more fairness and balance in addressing social or environmental costs imposed by economic development.

Hyper-globalization is a unitary meta-narrative that seeks to drown out a cognitive scripts that would redefine "development" as a pluralist convergence of competing narratives to achieve improved and complementary economic, social, and environmental outcomes (the triple bottom line). Dani Rodrik (2011) has called attention to the "political trilemma" that confronts globalization. As currently framed, globalization may be compatible with either national sovereignty, via the golden straightjacket, or democracy via creation of new forms of global democratic governance. Pragmatic reconciliation of these three constructs will require more openness and transparency in exploring and resolving policy differences, new democratic institutions that include and empower stakeholder dialog and engagement, and greater flexibility and balance in easing paradoxical tensions in addressing complex, "messy" problems (Calton and Payne 2003). Public policy controversies surrounding NAFTA and the ethics of food would be a good place to start in reimagining a more ethical global policy regime.

Cross-References

- ▶ Food and Agricultural Trade and National Sovereignty
- ▶ Intellectual Property Rights and Trade in the Food and Agricultural Sectors
- ▶ Trade and Development in the Food and Agricultural Sectors
- ▶ WTO Dispute Settlement and Food and Agricultural Trade

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Nanotechnology in Agriculture

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Introduction

Climate change and increased global population give rise to a special emphasis on how agriculture can expand production under changing conditions. Agriculture has also seen radical changes the last century with a turn towards research-based, industrialized agriculture with large-scale monocultures, mechanization, increased irrigation, use of artificial fertilizers, and pest control systems, combined with a change from local towards export-oriented making of products to be used for food, feed, fuel, and fiber. Biotechnology-based interventions such as systematic breeding, as witnessed in the Green Revolution, and genetic modification have led to commercially successful but politically controversial herbicide-tolerant and pest-resilient varieties of major crops, with promises of a wide range of new varieties in the years to come. In recent years nanotechnology methods and products have been added to the techno-scientific possibilities of improvements to agricultural production.

As yet, there are few if any commercially available products, but nanotechnology holds promises for increasing efficiency within animal and plant breeding; for increased nutritional value, and production inputs as feed additives, chemicals, and pesticides; for new efficient means for diagnosis and surveillance of diseases; as well as possibilities for precision farming techniques. Moreover, also with importance for agriculture is the possibility for using nanosensors for detecting and removing salt and pollutants from water and soil. Here some of these new developments will be briefly presented, with focus mainly on the agriculture production system and not on food products as such (packaging, detection of contaminants and pathogens, nano barcodes, etc.). New emerging technologies as nanotechnology can be used for solving problems as well as enhancing production and efficiency but do also raise questions with regard to food and environmental safety and socio-economic, ethical, and regulatory issues that will be highlighted.

Nanotechnology: Definitions and Uniqueness

Nanotechnology has some sociopolitical features distinguishing it from other emergent technologies. Some claim that it represents nothing new, being just a more attractive way to fund research and sell products derived from established practices in chemistry, whereas other novel

technologies have had clearly defined characteristics. Therefore, there have been several claims of the field being built on hype more than realistic hope – with similar hyperbole regarding potential hazards (see, e.g., Nordmann 2007 and Wullweber 2008). In addition, the introduction of nanotechnology to the general public was accompanied with a call for ethical assessment, implying that the potential of the technologies is directly connected to the risks (The Royal Society and the Royal Academy of Engineering 2004). Consequently, it can be argued could even claim that this focus on potential hazards give support to the claims regarding potential benefits. These special characteristics of this technology can also be found in the literature on agricultural nanotechnology.

There are different definitions of nanotechnology. The interest in nanotechnologies is linked with the possibility for manipulation of material, devices, and other structure on an atomic and molecular scale. The National Nanotechnology Initiative in the USA defines the scale range for nanotechnology where at least one dimension has the approximate measure of 1–100 nm. Nanotechnology describes the creation and utilization of functional materials, devices, and systems with novel functions and properties that are based either on geometrical size or on material-specific peculiarities of nanostructures. The nanoscale has become accessible both by application of new physical instruments and procedures and by further diminution of present microsystems. Also structures of animated and non-animated nature were used as models for self-organizing matter (http://www.nanoforum.org "What is nano?").

There are numerous patents and several nanomaterials and nanoparticles have reached the market (http://www.nanotechproject.org); however there is little as yet directly applicable to agriculture. The field is largely unregulated and some products are advertised as nano without falling within the defined scale, whereas others that could be thus classified carry no indication that the product contains nanomaterials. Hence, the definition of nanotechnology is arguably also of legal significance because of the connected consequences for future regulatory regimes. It is reasonable to believe that regulatory mechanisms as well as labeling will be important issues when products derived from agricultural nanotechnology reach the market. The public conception and acceptance of nanotechnology will be decisive for the labeling strategies chosen by the industry.

Animal and Plant Breeding: New Possibilities with Nanotechnology

Breeding to achieve more productive animals and plants is of crucial importance in order to solve the future food challenges. At the same time, climate change has caused an increased focus on stress-tolerant plants, new modes of agriculture, as well as conservation agriculture. Traditional ways of breeding is time consuming and has caused a special interest in possibilities with biotechnological methods, and this has recently been expanded to include nanotechnology.

Convergence of Nano- and Biotechnology Techniques

Special focus has been on the possibility to enhance present genetic engineering techniques by using nanotechnology for improving precision. Nanotechnology may reduce time and cost of gene sequencing, improving the basis for genetic modification or directed breeding (Chen and Yada 2011). Nanotechnologies can also be used in the genetic modification process and even be involved in synthetic biology efforts to create novel plant varieties (Scrinis and Lyons 2007). Examples of such combinatory methods include crystal DNA and magic bullets (silica particles) that deliver genes to specific parts of plant or plant tissue, already used in plants (tobacco and maize). Through these combinations of technologies, new properties such as tolerance to drought, saline earth, low or high temperatures and other extreme conditions, altered growing seasons, better pest resistance, altered colors, and so forth be introduced faster and with more precision using options with nanotechnologies than by present-day techniques.

Functional Food and Feed

Different strategies can be used to enhance and alter nutritional components of food and feed. The first includes using nano-encapsulation techniques either for controlled delivery of micronutrients and bioactive compounds already found in food and feed (Sozer and Kokini 2012) or to alter the composition of nutrients and flavor to meet special preferences or physiological requirements (Chen and Yada 2011). Improvement of nutrients as, for example, omega 3 and omega 6 fatty acids, probiotics, and vitamins is also possible in relation to change in delivering properties and solubility. By provision of specific bindings with mycotoxin, aflatoxin, and pathogens, nano-sized additives can be used to reduce toxic impacts and disease in consumers (FAO and WHO 2010).

Examples of food products that are already on the market include a new variety of rapeseed containing tiny materials that can block cholesterol from fat entering the bloodstream (Farhang 2007), nano-iron in nutritional drinks, and nanominerals in breakfast cereals (Sozer and Kokini 2009). Whether all these should be called nanotechnology applications probably depends on the definition. There exists as yet no consistent regulation of these nanotechnology food additives (ibid.) although there is considerable ongoing work to develop the basis for regulation (Duvall et al. 2011).

Plant Production

Nanotechnology holds potential for increased plant production and for controlled agriculture practices.

Field Sensing Systems

Nanosensors can be used to facilitate real-time monitoring of the crop growth, field conditions, environmental stressors, and crop conditions (Chen and Yada 2011). Such field sensing systems, also called precision farming, can be used for identification of the right time to plant and to harvest and for detection of pests, viruses, weeds, or temperature and humidity changes as well as monitoring of soil nutrients. This can be facilitated by connecting nanomaterials working as sensors with global positioning systems or through network of wireless nanosensors in a field (Chen and Yada 2011; Nanoforum 2006). Once changes are identified, targeted measures can be initiated as application of pesticides, fertilizers, and irrigation.

One of the benefits by introducing field sensing systems in present agriculture practices is the potential for increased precison with the potential result of less use of chemicals. This will cause lower production costs and less adverse effects on the environment. Another benefit is that such monitoring systems can also be used to achieve increased understanding of the physical, chemical, and biological interactions between plants and pathogens that subsequently may lead to better treatment strategies.

Nanoscale Delivery Systems and Formulations

Within medicince the use of nanoscale delivery system has shown great promises. This has led to questions whether the same approach can be used for controlled delivery within agriculture of products as fertilizers, pesticides, herbicides, plant growth regulators, etc. The mechanism behind such nanoscale delivery systems is within the use of encapsulation, polymers and dendrimers, and surface ionic and weak bond attachments. By these mechanisms improved stability can be achieved and hence lesser amount of the products needs to be distributed and thereby results in reduced chemical runoff and environmental degradation. Formulations that contain nanoparticles within 100–250 nm size range are already in use in agriculture. These formulations have gained increased ability to dissolve in water with the impact that their activity is increased (Nanoforum 2006). Other applications are nano-emulsions with herbicides or pesticide particles in the range of 200–400 nm that have gained increased integration properties in gels, liquids, and creams that ease distribution. One example of a such nano-emolusion is a product marketed by Syngenta that releases

its insecticide when it comes in contact with the alkaline environments that are in the stomach of certain insects.

EHS for Farmers

The different formulations containing nanoparticles that are already on the market are not labeled (Scrinis and Lyons 2007). They have been developed with the intention to increase capacity for absorption into plants compared to larger particles. These altered properties imply novel health risks to farmers as well as animals that need to be investigated. The current state of scientific uncertainty regarding these potential hazards implies that a precautionary approach is warranted.

Diagnostics and Vaccines

Diseases within agriculture are causing economic problems for farmers and are affecting animal welfare. Nanotechnology hold promises for developments within vaccines and with regard to detection and diagnostics of diseases. There has been a shift in focus within vaccine research to the design of delivery systems that are able to mimic pathogens in size and composition. Examples include virosomes, liposomes, and polymeric nanoparticles (Panda 2012). Such structures can contain specific drugs that are delivered at the intracellular level to obtain desired and optimal immune responses against a given pathogen. The use of polymeric micro- and nanoparticles in vaccine delivery systems represents at present a highly studied approach (Lü et al. 2009). Drug nanocarriers may also be developed by using polymers, albumin, gelatin, alginate, collagen, and chitosan that also are biocompatible and are biodegraded at different rates after vaccination.

The use of a biosensor composed of a biological component as a cell, enzyme, or antibody linked to a wireless device can be used to detect changes within cells and molecules and produces when activated by binding a signal that is proportional to the quantity of the substance that is recognized. The use of such nanosensors also opens up for real-time information about animal health status as well as early detection of animals with diseases. These animals can be isolated before the disease becomes a serious problem within the holding (Evers et al. 2008).

Environmental Remediation and Detection

Modern agriculture methods including industrialized agriculture have seriously affected surrounding environments. Nanoparticles can be used as means for degradation of pollutants (Baruah and Dutta 2009), for example, by photocatalysis, using metal oxide semiconductor nanostructures, organic pesticides and industrial pollutants can be degraded into benign environmental components. The same approach can be used for desalination and purification of soil and water. The detection of the abovementioned contaminants can also be facilitated by nanotechnology, using electromechanical and optical sensors. However, there are toxicity and stability issues, making the range of possible applications uncertain at the current stage of technology development.

Food, Animal, and Environmental Safety

Concerns about the adverse effects of nanoparticles and nanomaterials on the environment and human health are primarily related to the following characteristics (The Royal Society and the Royal Academy of Engineering 2004):

- Their large surface area, crystalline structure, and reactivity, which can facilitate transport in the environment or the body.
- Ultrafine particles may have a different biological behavior and mobility than the larger particles.

Within the past years, an increasing number of requests for toxicity studies have been raised; however, there are still only a few ecotoxicity studies that have been published. Although some of them have provided empirical evidence

that occupational and environmental exposure to nanoparticles can lead to adverse health effects on living organisms, there is still need for the establishment of methods and approaches for identification and for evaluating the risks of harm to environment and human health. The size of the particles in itself is also of importance, especially when considering that such particles could accidentally and without notice be distributed to living systems through air, soil, and water.

Distribution and Persistence of Nanoparticles

Nanoparticles can enter the body via the digestive tract by ingestion and drinking, the lungs via the respiratory tract, and possibly the skin through dermal exposure. Once in the body, nanoparticles can be redistributed to organs or tissues through the blood circulation or by cell migration. For some of the new approaches as the use of nanocarriers in vaccine delivery, there are unresolved issues related to unintended effects as, for example, effects by distribution to nontarget organs and cells. There is a great need of information about likely exposure levels, dose–response relationships, modes of action, and fate in the environment, the mechanisms of toxicity, and processes of elimination and accumulation of nanoparticles (Grieger et al. 2009).

Animal Welfare Issues

With the introduction of new technologies, there can be conflicts and trade-offs between short-term profit of the industry and demand for cheap animal products on one hand and animal welfare on the other hand (Olesen et al. 2010). The possibilities within breeding of animals with nanotechnology will as with other breeding strategies focus on the goal to enhance characteristics and traits such as productivity and growth. However, it is also important to be aware that the pursuit of such goals may deteriorate awareness for low heritable traits such as health, welfare, and fertility. Due to the significant lack of knowledge concerning potential threats to health and environment, it is possible that the use of nano-based feed and drug delivery technologies may result in serious animal welfare problems. There are insufficient grounds for saying that it is scientifically plausible that such products will cause harm, but the lack of knowledge implies that it is reasonable to argue for a precautionary approach to the use of nanotechnologies in animal feed and medication, although that is disputed (Lin 2008; Evers et al. 2007).

Environmental Issues

Nanotechnological products intended for use in agriculture can spread, persist, and end up as environmental problems. For example, the size and dissolvability of nanoparticle pesticides imply that they can contaminate surrounding soils, waterways, and food chains and be ingested or taken up by living organisms (Scrinis and Lyons 2007). Nanoparticles are already part of the natural environment, but there is insufficient knowledge of how novel laboratory-produced nanoparticles will behave when released in vivo. Both the time they remain in air and the time they use to dissolve or break down can be significantly different from that of larger particles. Several authors have pointed out that although the knowledge of environmental effects is largely unknown, the research funding for research in environmental impact is low.

Ethical Issues

Agricultural nanotechnology is aiming at contributing to solving pressing problems of the future of humanity. As such it is ethically good pursuing this research and development. However, it is know from history that good intention is not sufficient; it is still necessary to ask what kind of technology and type of applications will contribute to a good future. Thus, this is an ethical matter. Ethical issues can be classified as intrinsic and extrinsic, the first being those that concerns the moral value of the activity in itself and the second those that relate to the moral value of the

context and the effects of the activity. Food production plays a crucial role in human life and is a central part of culture. This is evident in the controversy connected to biotechnology in agriculture, where a series of surveys show that the general public and farmers find this kind of technological intervention to be morally unacceptable for intrinsic reasons. The objections are typically expressed as in terms of the technology being unnatural or represents playing God. Both convergence of nanotechnology with gene technology and other nanotechnology interventions share the characteristics making gene technology considered unnatural. Despite general scientific and philosophical objections concerning the factual and conceptual problems with the naturalness argument, it remains a challenge for bio- and nanotechnology in agriculture.

The main extrinsic concerns are connected to issues of risk and scientific uncertainty concerning possible harm to human health and to the environment on the one hand, as discussed above, and socioeconomic and political aspects of the technology on the other hand. Unresolved risks as well as awareness of scientific uncertainty with nanotechnological applications call for implementation of the precautionary principle in decision-making processes. To improve the basis for decision making, risk-associated research needs to be carried out. In practice such research implies a combined scientific and ethical analysis, where scientific research integrates social science as well as ethics perspectives on the relevant science and technology (Myhr and Myskja 2011). The goal must be to ensure a responsible development and introduction of nanotechnology in agriculture.

Socioeconomic Issues

The intention by introducing new technologies in agriculture is to increase food production and enhance production security. However, new technologies may also increase corporate ownership and alters the economic control between different actors within the agriculture system (Scrinis and Lyons 2007). This has been pointed out in numerous articles on industrialized agriculture, and is one of the key issues presently discussed in relation to the introduction of modern biotechnology on farming practices. These tendencies towards a "bioindustrial paradigm" can be further strengthened by agricultural nanotechnology, since some of the new developments as convergence of nano- and biotechnology within breeding and field sensing system can be best suited for large-scale farmers in the developed world. Moreover the benefits from, for example, precision farming systems can only be achieved in advanced and intensive agriculture systems.

It follows that the turn towards nanotechnology primarily benefits the large-scale farmers in the rich parts of the world. If this is correct, nanotechnology in agriculture is yet another element in present allegedly negative tendencies. In the rich world, the corporate farm is replacing the small family farms. On a global scale, it contributes to the technology divide, widening the gap between rich and poor. Therefore it is crucial that institutions that are involved in developments of nanotechnological applications for agriculture also emphasize how the new possibilities can be used to enhance food security for small-scale farmers and how to meet challenges in agriculture in the developing world. Capacity building is necessary both with regard to the technology in itself and also with regard to assessment and management of risks for health and environment.

Summary

Nanotechnology has a great potential for increasing efficiency within agriculture and for solving problems related to climate change, diseases, and pollution. At the same time, it is important that, potential risk and concerns about unforeseen adverse effects need to be taken seriously and should be reflected in regulatory frameworks. Regulators needs to be aware that the unique properties of nanotechnological products may also represent new risk and thereby raise the following important questions: Are the present

test procedures good enough? Are the laws good enough? Should a precautionary approach be employed? To cope with potential uncertainties and risks, innovation processes need to be combined with approaches that have inbuilt awareness for risk to environment and health of both farmers and consumers. The success or failure of nanotechnological applications will depend on market and consumer acceptance. As with GMOs it can be expected that nanotechnology in agriculture and food products will be received differently because of national and local sensitivities, traditions, and social and political cultures. To build farmer and consumer trust, it will be necessary to label both the inputs into agriculture, as new types of pesticides, as well as the food product before it is available in the local grocery.

Cross-References

- ▶ Agricultural Ethics
- ▶ Biotechnology and Food Policy, Governance
- ▶ Climate Change, Ethics, and Food Production
- ▶ Environmental Ethics
- ▶ Functional Foods
- ▶ Transgenic Crops

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National Courts and the Right to Food

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Synonyms

Domestic courts; Domestic litigation; Economic and social rights; Enforcing human rights; Justiciability; National courts; National litigation

Introduction

National courts can play a key role in the advancement of the right to food by ensuring that the right is upheld and through providing redress to individuals whose rights have been violated. However, while the right to food has been enshrined in international law since 1948, it is only over the past twenty years that the international community has sought to clarify the content and scope of the right and that states have begun to adopt the right into domestic legal systems. Right to food litigation is still in a nascent stage of development, with a growing but still limited number of domestic courts around the globe having expounded upon its tenets or made findings of violations. Nevertheless, there have been cases where litigants have claimed violations of the right to food and where courts have made significant rulings. This entry outlines the content of the right to food, the role national courts can play in implementing and enforcing the right to food, and what courts have done to date. It also offers some brief comments on the controversies of using national courts in the promotion of the right to food and highlights possible developments that may be seen in the future.

Background on the Right to Food

The right to adequate food is a human right enshrined in the Universal Declaration of Human Rights (UDHR) (Article 25), the International Covenant on Economic, Social and Cultural Rights (Article 11) (ICESCR 1966), and a host of other international instruments including the Convention on the Rights of the Child (Articles 24(2)(c) and 27(3)) and the Convention on the Elimination of All Forms of Discrimination against Women (Article 12(2)). The right to adequate food, as part of the right to an adequate standard of living, "is realized when every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement" (UNCESCR 1999). The right to food protects the right of all human beings to feed themselves in dignity, either by producing or by purchasing food.

States are the primary duty bearers with respect to the right to food. Specifically, states have three substantive obligations flowing from the right to food – the obligations to respect, protect, and fulfill the right to food. The obligation to *respect* requires the state to not engage in activities that hinder access to food. The obligation to *protect* requires the state to ensure that third parties do not hinder the ability of people to grow or purchase food. The obligation to *fulfill* requires the state to ensure that no one goes hungry, even during times of emergency, and to engage in remedying systemic structural causes of food insecurity. States are also required to follow a number of procedural requirements and must ensure participation of the population in the development of policies, programs, and laws and nondiscrimination throughout the implementation process.

While the right to food was first articulated in 1948 in the UDHR, it was not until the mid-1990s that states began to adopt and implement the right to food in the national context. The adoption of the right to food corresponded largely with efforts by the international community to clarify the content of the right to food and the means for its implementation through General Comment

No. 12: The Right to Adequate Food and the *Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security*. These documents stress adopting domestic framework laws, monitoring mechanisms, and remedy procedures and outline unique roles in the protection and promotion of the right to food for the legislature, executive, and courts (UNCESCR 1999; FAO 2004).

With respect to national courts and the role of national courts in the implementation of the right to food, General Comment No. 12 provides that "[a]ny person or group who is a victim of a violation of the right to adequate food should have access to effective judicial or other appropriate remedies," specifically restitution, compensation, satisfaction, and guarantees of non-repetition (UNCESCR 1999). It urges the incorporation of the right to food into domestic instruments, in part because incorporation "can significantly enhance the scope and effectiveness of remedial measures" (UNCESCR 1999). Through incorporation, courts are "empowered to adjudicate violations of the core content of the right to food by direct reference to obligations under the Covenant" (UNCESCR 1999).

States can afford legal protection of the right to food in a number of ways. Some states, such as Argentina and Norway, grant international law and treaties such as the ICESCR constitutional rank and as a result implicitly guarantee the right to food (De Schutter 2013). However, the most common way that states have adopted the right to food is through constitutional protection and the adoption of right to food framework laws. Constitutional rights serve as governing principles for states and, depending on the domestic legal system, cannot be derogated from. To date, over twenty countries, including South Africa, Brazil, and Kenya, have amended or adopted constitutions to include the right to food. Right to food framework laws, such as those in Guatemala, Ecuador, Venezuela, Nicaragua, and Honduras, can also provide legal protection of the right to food – often in a more coordinated and detailed fashion than through constitutional protection.

The Role of National Courts in the Adoption of the Right to Food

Where the right to food has been adopted into the domestic legal system, courts can serve as key monitoring agents of the domestic laws and constitutional provisions, providing a venue for the review of government action (or inaction) by individuals or groups within the state. In this way, domestic courts provide an accountability mechanism, holding the government accountable for human rights violations and protecting the social contract between individuals and the state. While every jurisdiction may provide courts with different powers, the following list speaks in a broad fashion to how a national court may engage in the promotion and protection of the right to food:

First, as independent interpreting agents, courts define the scope and content of domestic obligations whether constitutional, legislative, or drawn from international law. Courts, particularly in common-law jurisdictions, may define what constitutes the right to food in their jurisdiction, or provide a test for what would constitute a violation of the right to food. Through the interpretation process, courts can significantly advance the right to food.

Second, courts can ensure that domestic laws and regulations do not conflict with the requirements of the right to food. Where conflicts do exist, courts may have the competence to direct how laws and regulations are implemented or interpreted and may even have the ability to strike particular sections or the entire legislation or regulation, where the sections or entire law violate human rights. This is particularly the case in states where there is constitutional protection of the right to food.

Third, courts can address specific violations of the right to food, be they violations of the obligation to respect, protect, or fulfill the right to food. Courts can require the government to refrain from acting in certain ways, to act proactive in others (e.g., provide food, draft laws or regulations, develop programs

or policies), or to restrict third parties. Courts can also order remedies for victims of right to food violations and review the implementation of social protection schemes or other programs (such as school feeding programs or rural extension services) to ensure, for example, nondiscrimination in the provision of services or the participation of affected communities in policy-making.

Litigating the right to food through national courts, regardless of the outcome, can also help to promote the right to food by raising public awareness. Litigation through national courts can be a tool for advancing the right more broadly by educating the public, bringing attention to particular issues, providing information about rights to a wider audience of right holders, and creating alliances or solidarity among the public. Using national courts can also form part of a greater strategy for advancing the right to food – one that combines public campaigns for legislation and national policies, political and legislative lobbying, or demonstrations and public awareness activities (Cohen and Brown 2005; Courtis 2007). For example, the Right to Food Campaign in India, an informal network of individuals and organizations "committed to the realisation of the right to food in India," has worked alongside a piece of litigation to raise awareness and push for legislation on the right to food (Cohen and Brown 2005).

National Courts and the Right to Food: Examples

A growing number of states have granted legal protection for the right to food, many of which are highlighted above, but courts, as of yet, have only heard a limited number of cases concerning the right to food directly (Knuth and Vidar 2011; De Schutter 2012a, b; Golay 2009). These cases, however, provide clear insight into how national courts promote and address violations of the right to food and how they could continue to do so in the future.

The most notable right to food case in a national court comes from India. The case *People's Union for Civil Liberties v. Union of India and Others* was initiated in 2001 in response to the government's failure to distribute employment and food relief mandated by the Rajasthan Famine Code of 1962 (Writ Petition 2001). Specifically, the case was brought against the Government of India, the Food Corporation of India, and six state governments on the basis that these government entities failed to address hunger and starvation-related deaths in a time of surplus and in violation of existing laws, programs, and the Constitution (Birchfield and Corsi 2010b). While there is no express provision in the Indian Constitution guaranteeing the right to food, the litigants relied on a constitutional precedent, which defined the right to life, under Article 21, as including the right to adequate nutrition (Birchfield and Corsi 2010a).

In the last decade, the case, which is still ongoing, has expanded in reach, encompassing all state governments, and scope, focusing on larger systemic issues of food insecurity, poverty, and unemployment (Birchfield and Corsi 2010a). The Supreme Court has issued a series of significant interim orders that have recognized a constitutional right to food, identified a number of food schemes as legal entitlements, determined a basic nutritional floor, and provided directives in the creation, preservation, and proper implementation of various programs, such as the national Mid-Day Meal Scheme (providing food in school) and the Public Distribution System (delivering grains to people in extreme poverty) (Birchfield and Corsi 2010b). The Supreme Court also established new accountability mechanisms, in particular, a new commission to monitor and report on noncompliance with court orders related to the right to food. Following the efforts of the commission, the Court, and a civil society campaign (entitled the Right to Food Campaign), a participatory process to draft national legislation to codify the various entitlements achieved through the interim orders was initiated by the government. On July 5, 2013, the government adopted the National Food Security Ordinance (Birchfield and Corsi 2010b; De Schutter 2013). The case is an example of how courts can address

the obligation of states to *protect* and *fulfill* the right to food, as well as ensure nondiscrimination and the effective provision of laws, policies, and programs. It is also a prime example of how national courts, litigation strategies, and effective public advocacy, when combined, can be most effective in promoting the right to food.

While other cases have been less spectacular in their reach, length, and scope than the *People's Union for Civil Liberties* in India, there are numerous other examples where courts have actively engaged with the right to food. First, a number of courts have provided a venue for the review of government action (or inaction). In one example, the Sectional Court of Appeal in San Pedro Sula, Honduras, enforced the state obligation to *protect* the right to food by granting a constitutional remedy to prevent the eviction of a peasant group, Brisas del Bejuco, from the land they relied on for subsistence agriculture (De Schutter 2013; Cruz 2010). The Court, referring to the obligation of the state to protect the right to food, as outlined in the ICESCR, affirmed that evictions would lead to human rights violations and voided the eviction order (Cruz 2010).

In another example, the High Court in Uganda at Kampala enforced both the obligations to *respect* and *protect* the right to food to address not only state action but also the failure of the state to prevent the actions of a private enterprise (De Schutter 2013). The Court ruled in March 2013 on behalf of 2,041 peasants primarily engaged in subsistence farming in Mubende, Uganda, who were brutally expelled from their homes and farms in the summer of 2001, so that their land – land they depended on to meet their food needs – could be leased to Kaweri Coffee Plantation Ltd., a solely owned subsidiary of the Neumann Kaffee Gruppe, headquartered in Germany (Baleke and Others 2002; De Schutter 2013). The Court held that the state agents were liable for violations and ordered that compensation be paid to the peasants. In addition, the Court held that investors "had a duty to ensure that . . . indigenous people were not exploited. . . . They should have respected for the human rights and values of people and as honourable businessmen and investors they should have not moved into the lands unless they had satisfied themselves that the tenants were properly compensated, relocated, and adequate notice was given to them" (Baleke and Others 2013).

Courts are also able to review government legislation or programs, particularly in countries with constitutional protection of the right to food, for compliance with right to food principles. While not directly a right to food case, an example from South Africa illustrates how courts can examine legislation for its impact on the ability of people to meet their food needs. In *Kenneth George and others v. Minister of Environmental Affairs and Tourism*, a number of fisherfolk challenged the Marine Living Resources Act, which favored commercial fishing over small-scale traditional fisheries resulting in many communities of small-scale fisherfolk losing access to the ocean and, therefore, their primary source of food and income. They alleged the government had failed to *respect*, *protect*, and *promote* their right to food by not only failing to improve but also reducing their access to food (Jaffer 2007). In 2007, the High Court, ruling on equality grounds, and not the right to food, provided remedies to the fishing communities and mandated the government to create a participatory and inclusive task force to prepare a new legislative and policy framework that would "take into account international and national legal obligation and policy directives to accommodate the socio-economic rights of these fishers and to ensure equitable access to marine resources for those fishers" (Kenneth George and Others 2007). Following the court order, a committee was formed, and on May 4, 2012 after a public consultation process the Small Scale Fisheries Policy entered into force (De Schutter 2012a).

Many of these examples also illustrate how courts have addressed individual violations of the right to food, as well as failures of states to meet their obligations to *fulfill* the right to food. Other examples include a recent case from a juvenile court in Guatemala concerning five children in two villages who were left malnourished as the result of the state's failure to *fulfill* the right to food and provide needed support. In the decision, grounded in Guatemala's Food and

Nutrition Security Law, adopted in 2005, as well as Guatemala's obligations under the ICESCR, the court ordered 10 government institutions to adopt 26 specific measures including restitution and compensation measures such a food assistance, land distribution, water access, and agricultural training (FIAN 2013; De Schutter 2013). Another example comes from Nepal, where the Supreme Court in *Pro Public v. Government of Nepal* issued an interim order in 2008 to address the immediate need of several communities that were not being reached by food distribution programs already in place. The basis of the claim was a provision of the 2007 Interim Constitution of Nepal, which guaranteed a right to food sovereignty, as well as Nepal's obligations under international law to fulfill the right to food (Pro Public 2010).

Beyond the national court context, the right to food has also been upheld in regional human rights courts. In 2011, the African Commission on Human and Peoples' Rights (ACHPR) found inter alia that the Nigerian government had violated their obligation to *respect* and *protect* the right to food of Ogoni communities by both destroying and allowing third parties to destroy their food sources and causing environmental contamination and degradation (SERAC et al. v. Nigeria 2002). Further, the Inter-American Court of Human Rights in the 2006 decision in *Comunidad Indígena Sawhoyamaxa v. Paraguay* considered whether the right to food constituted an integral component of the right to life (Cruz 2010). Finally, the Court of Justice of the Economic Community of West African States in 2012 found that groups have protected rights to the resources they depend on for an adequate standard of living, including the right to food (SERAP v. Nigeria 2012).

Challenges and Controversies to Utilizing National Courts to Enforce the Right to Food

Using courts to advance the right to food poses particular challenges. The first set of challenges relates to the practical realities of using national courts as a means for advancing and protecting the right to food. These challenges include:

- *Access to justice*: The cost of bringing a legal action in a national court can be exceedingly high. Litigants must pay court fees, disbursements, and lawyers. However, right to food violations are often experienced by the most marginalized and poorest members of society, for whom the ability to bring an action in a national court or to even access a lawyer may be highly limited. Similarly, the majority of the world's hungry are rural smallholder farmers and peasants in the Global South (IFAD 2011; Hirsch 2009). Ensuring access to justice in rural communities may pose even greater challenges than in cities for the purely logistical reason of availability of lawyers and ability of lawyers to reach communities.
- *Access to knowledge*: Access to knowledge about what constitutes a violation of the right to food can be key in a community or an individual's ability to mobilize. In the Brisas del Bejuco case in Honduras, for example, arguments made on behalf of the community were based on knowledge learned by a community member at a right to food training course (Cruz 2010). Without this knowledge, the community may not have known there was even a cause of action to advance and may not have sought legal assistance.
- *Speed of litigation*: Litigation and the enforcement of rights through national courts may be effective, but it will likely not be speedy. For example, in the Mubende, Uganda case, the peasants concerned were evicted in 2001, filed a court action in 2002, and finally received a verdict in their favor on March 28, 2013 (H.C.C.S. No. 179/2002; De Schutter 2013). While courts can order interim injunctions or interim remedies, as was done in the *People's Union for Civil Liberties* in India and *Pro Public* in Nepal, a decision on the merits may be a distant prospect.

A further set of challenges draws from the procedural and jurisdictional requirements of many judicial systems and the characteristics often associated with victims of right to food violations. Many judicial systems contain

complex procedural and jurisdictional requirements for bringing litigations such as requirements for standing (finding individuals or groups who may legally bring an action) or timing (bringing an action that is neither moot nor ripe). Some countries have addressed standing challenges by allowing public interest standing, whereby an entity can represent a population who may be unable to bring a case on their own. For example, the People's Union for Civil Liberties in India relied on a public interest standing provision in order to represent communities in Rajasthan and later food-insecure populations across the country. With respect to timing, different countries allow actions to be brought preemptively before a violation has occurred, during a violation, and after a violation.

A third set of challenges relates to the commonly held view that economic and social rights, including the right to food, are not justiciable and not enforceable by courts. The basis of this belief is multifaceted stemming from both a concern towards the cost and complexity of enforcing economic and social rights and a respect of the separation of powers. Implementing economic and social rights, as opposed to civil and political rights (the right to vote, the right to a fair trial, etc.), is seen as complex and costly because the rights require a redistribution of resources as well as the establishment of infrastructure or social programming to deliver the resources. This leads to more complex laws and a more expansive state (Kelley 1998; Neier 2006). Drawing from this, economic and social rights are viewed as nonjusticiable, with courts being the improper venue to adjudicate violations because of the traditional separation of powers. Courts do not have the power of the purse and are not afforded law-making abilities. Allowing courts to adjudicate and make decisions with major financial and infrastructural consequences is viewed as an encroachment on the other branches of government, in particular the legislature. A recent court in Canada expressed such concerns when it found that economic rights, and in particular the right to housing, were not justiciable and that no protection for economic rights could be read into the Canadian *Charter of Rights and Freedoms* (Tanudjaja v. Attorney General (Canada) 2013).

National Courts in the Future

Despite the critiques and challenges to bringing right to food cases, national courts around the world are increasingly hearing and deciding cases on the right to food. As more countries adopt framework laws and constitutional protection of the right to food, or interpret the right to life as including a right to adequate food, more litigants may be able to bring right to food cases to court.

Changing understandings of the scope and reach of human rights law may also expand the role of national courts in the protection and promotion of the right to food in the future. For example, increased attention on the human rights obligations of businesses may lead litigants to challenge the actions of business enterprises on human rights grounds (Ruggie 2011). Similarly, a growing concern over violations of extraterritorial human rights obligations may lead to foreign litigants challenging government action in national courts as a result of violations committed abroad (Maastricht Principles 2012).

What role courts will play in the protection of the right to food in the future will depend on the ability of litigants to access courts, the availability of enforceable law for the judiciary to rely on, and the openness of the judiciary to engage in economic and social rights. The experiences of domestic courts to date illustrate that courts can be powerful actors in the fight against hunger, but that their role could be expanded. With the proper tools, courts could play an even greater role in protecting and promoting the right to food and serve as a source of redress for individuals whose rights have been violated.

Summary

National courts can play a key role in the advancement of the right to food by ensuring the right to food is upheld and through providing redress to individuals whose rights have been violated. Right to food litigation is still a relatively new phenomenon, with few domestic courts around the globe having expounded upon

its tenets or made findings of violations. Nevertheless, there have been cases where litigants have claimed violations of the right to food and where courts have made significant rulings on this most fundamental human right. This entry outlines the content of the right to food, the role national courts can play in implementing and enforcing the right to food, and what courts have done up to date.

Cross-References

- ▶ Access to Land and the Right to Food
- ▶ Food Security in Systemic Context
- ▶ Human Rights and Food
- ▶ Land Acquisitions for Food and Fuel
- ▶ Poverty and Basic Needs
- ▶ Right to Food in International Law

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Natural Food

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Introduction

In April 2012, a picture of a note posted in a natural food store in Rhode Island went viral. It stated that Kashi cereals were taken off the shelves because they were made with genetically modified ingredients. For many customers, the use of genetically modified soy was incompatible with the company's "natural" labeling, but Kashi argued they had not done anything wrong. As a spokesperson explained, "the company defines natural as 'food that's minimally processed, made with no artificial colors, flavors, preservatives or sweeteners.'"

This case highlights the confusion around the concept of natural food. The *Codex Alimentarius*, established by the International Food and Agriculture Organization and the World Health Organization, includes no principles or guidelines for the production and labeling of natural food (World Health Organization and Food and Agriculture Organization of the United Nations 2013). Many countries have nonetheless developed their own definitions of the term "natural" as it applies to food. In the United Kingdom, for instance, the Food Standards Agency restricts the use of the label "natural" to foods that have "ingredients produced by nature, not the work of man or interfered with by man" (Food Standards Agency 2008). In Canada, the *processes* involved are what matters; the Canadian Food Inspection Agency (CFIA) states that food products should not be described as natural if they were "submitted to processes that have significantly altered their original physical, chemical, or biological state." CFIA goes on to give a list of processes affecting the natural character of food (Canadian Food Inspection Agency 2012, section 4.7). In the United States, the Food and Drug Administration (FDA) does not restrict the use of the term "natural," but discourages the food industry from using it. It is interesting to note that after beginning a process of trying to define the term in 1991, the FDA finally gave up in 1993 (Houchins 2008).

Kashi's case is not unique. Using the claim that some food is "natural" or "all natural" as a selling point is widespread in food marketing today. The success of the "natural" label as a marketing tool suggests that many customers are looking to eat food that is – at least in some sense – natural and that they consider that food labeled as such is somehow better than the food they deem "unnatural." A survey conducted among 1,006 US customers even shows that American customers do believe that a "natural" label is greener than "organic" (Scott-Thomas 2009). As the confusion around it shows, the term "natural" is a polysemous one. In his book *Keywords*, Raymond Williams (1985, p. 219) notes that "[n]ature is perhaps the most complex word in the language," and long before him, Hume (1978, p. 474) famously said of the word "nature" that "there is none more ambiguous and equivocal." This equivocity of "nature" makes it uneasy to clearly understand statements about the value-adding character of naturalness. This entry examines the various meanings of "natural" and their possible relevance for food ethics.

Natural, Supernatural, Artificial

A classical examination of the meaning of "natural" and its ethical relevance can be found in J. S. Mill's essay "On Nature" (Mill 1874). In this essay, Mill isolates two meanings of "natural." A first meaning, which will be referred to as **natural$_1$**, denotes "the sum of all phenomena, together with the causes which produce them; including not only all that happens, but all that is capable of happening; the unused capabilities

of causes being as much a part of the idea of Nature as those which take effect" (Mill 1874, p. 5). This concept includes as natural all that happens in the physical world and thus defines "nature" as opposed to the *supernatural* or the *miraculous*. In a second sense, which will be called **natural$_2$**, "natural" means "what takes place without the agency, or without the voluntary and intentional agency, of man" (Mill 1874, p. 8). In this second sense, *natural* is opposed to *artificial*, understood as *human-made*.

In the context of natural food, **natural$_1$** is an obviously trivial concept, as food production cannot escape the laws of physics and make use of *supernatural* powers. **Natural$_1$** is presumably the concept involved in most empty and deceitful claims of naturalness, such as those assigning an "all natural" label to highly processed food, like Frito-Lay's line of "natural" potato chips or "natural" white cheddar *Cheetos*.

Natural$_2$, by defining naturalness in opposition to human intervention, seems, at first sight, to be a more plausible value-adding concept of naturalness. It can be seen for instance on the packaging of juices containing "only fruits." "Natural food" is colloquially opposed to "processed food," and here the epithet "processed" points intuitively to some technological transformation operated by humans. However, given the fact that almost all food consumed today is somehow human transformed and that many ingredients would not be comestible prior to undergoing at least some basic processing (e.g., chopping, mixing, centrifugation, deboning, or cooking), the concept of **natural$_2$**, if it is understood as an *all-or-nothing* affair, risks casting the net of natural food on a too-restrictive class of products. Even raw fruits like oranges, which often remain green when they are ripe, are exposed to ethylene gas to make them orange and saleable. Under an *all-or-nothing* interpretation, perhaps only berries self-picked in the wild would count as natural food. But as Siipi (2008, pp. 77–8) remarks, **natural$_2$** need not be so restrictively construed and can also be interpreted as a *continuous gradient*. In such an interpretation, food can be more or less natural according to the *amount* of human transformation involved in its preparation. Therefore, it seems that **natural$_2$** must be understood in this later way if it is to be applied to food in a practical way. There is a significantly different degree of transformation involved in, on the one hand, transformations that are usually not taken to destroy the naturalness of a product (e.g., grinding wheat and cutting up and cooking meat) and those involved in, on the other hand, the production of industrially processed food (e.g., hydrogenation, interesterification). Thus, **naturalness$_2$** interpreted as a *continuous gradient* seems better able than **natural$_1$** and the *all-or-nothing* **natural$_2$** to account for the distinction between natural and processed food by those who assign value to food in virtue of its naturalness.

A problem that remains with the continuous gradient **natural$_2$** concept, however, is that it appears to involve some level of arbitrariness. A first kind of arbitrariness comes from the fact that, as all other gradient notions when used for classificatory purposes, it faces a *threshold problem*. Provided that one could develop an uncontroversial way to quantify the degree of naturalness of a product (and this is far from being achieved), one would still have to establish a threshold above which some food is too human transformed to be legitimately labeled "natural." As the continuous gradient of **naturalness$_2$** logically cannot, by itself, provide grounds to establish it, such a threshold would have to be set in reference to a property other than naturalness (say, the property of being the result of *industrial* transformations). Yet it follows then that this other property would have to be defined with some precision, and, to avoid circularity, this definition would have to avoid any reference to naturalness. In this case, however, the products under the established threshold of naturalness would be established as more desirable not in virtue of their naturalness$_2$ *per se*, but in virtue of this other property by which the threshold is set.

Another, and perhaps more profound, way in which the **natural$_2$** involves arbitrariness is that, by defining naturalness in opposition to human agency, it implicitly sets humans outside of nature. This is arbitrary because it is widely

accepted, and has been since Darwin first voiced his theory, that humans are the product of the same evolutionary processes as all other living beings, and that there can only be differences of *degree* between what human and nonhuman living beings do (Callicott 1991, pp. 349–50; Vogel 2003, p. 152). In this context, it is arbitrary to draw a special class with the outcomes of human activities. One could withstand this upshot by putting forward that human activity is significantly different from what other living beings do, because we humans are cultural beings, and this allows us to have incomparably more dramatic impacts on our environment than those of other animals. This response seems plausible, as although, like humans, other species significantly modify their environments (Ereshefsky 2007, p. 60; Jones et al. 1994) and transmit knowledge culturally (Ereshefsky 2007, pp. 65–6; Callicott 1991, p. 351), it seems correct to assert that *Homo sapiens* are unrivaled in the *degree* of these modifications. As Callicott (1991, p. 351) notes, it seems reasonable to concede that "the cultural component in human behavior is so greatly developed as to have become more a difference of kind than of degree." As many ecologists have remarked (e.g., Angermeier 2000), this degree of cultural sophistication is what allows humans to have extraordinarily destructive impacts on the earth's ecosystems; the changes brought in the ecological world are so wide in scale that other species cannot evolve quickly enough to adapt to them. Similarly in the context of food and human health, one could argue that, given humans' ability to synthesize artificial molecules, our species is a lot more likely to produce molecules that cause health and ecological problems (like many of the chemical pesticides widely used in agriculture).

But should these observations be right, they would not support the claim that the potentially harmful effects of human's cultural abilities are such in virtue of their being the effect of human culture *per se*. The fact that our cultural abilities *can* generate harmful effects does not imply that they *must*. On the contrary, the very fact that humans are cultural beings is what makes it (in theory) possible for us to learn from our mistakes and create more innocuous alternatives to our unsafe products. Thus, it seems that harmful unnatural$_2$ products are not to be disvalued because of their **unnaturalness$_2$** itself, but rather because of their harmfulness. Hence, given the fact that there is no *necessary* connection between ecological or health harmfulness and the concept of **naturalness$_2$**, the human/nature dualism presupposed by this concept seems to remain arbitrary.

Naturalness, Biological Normality, and Processed Foods

If customers were shocked by Kashi's products, it is not because there is human agency involved in the production of those cereals. It is because they contained genetically modified soy. What is so special about genetic modification?

For ancient philosophers, "nature" was conceptually tied to *life*, as indicated by the etymology of the Latin word "natura," which means "birth," and its Greek equivalent "physis," which means "growth." In accordance with this etymology, Aristotle used "nature" principally to denote the inherent principle of growth and development of living beings. He viewed living beings as having their own teleological or goal-directed tendencies, and these tendencies explained their usual forms and directions of growth in terms of what is *natural* for them to do. As historians have observed, these teleological tendencies engendered *rules* regulating the typical behavior of natural entities. These rules admitted exceptions but stood *for the most part* or *the most often* (Daston and Park 1998, p. 120).

The possibility of exceptions to the rules of nature allowed Aristotelians to define a concept of naturalness which is different from Mill's **nature$_1$** and **nature$_2$**. For them, "natural" meant what happens according to the *normal* rules determining the functioning of complexly organized entities (resulting from their *telos*), and "unnatural" referred to breaches of these rules. The paradigm case of unnaturalness in this Aristotelian sense was that of *monsters*. For Aristotle, monsters were unnatural neither in the sense of

supernatural (**unnatural$_1$**) nor in that of *human-made* (**unnatural$_2$**), but in the sense that they were deviations from the normal course of biological nature. This characterization indicates a third concept of naturalness: the **natural$_3$**, which can be defined as what happens according to the normal or ordinary course of the organic world. It is distinct from **natural$_1$** in that this latter concept is tied to matter and its necessary laws (the basic laws of physics), whereas **natural$_3$** relates to nature as organized into forms and its rules of normal functioning. It also differs from **nature$_2$** in that it is not opposed in principle to human agency, for deviations from the normal course of organic nature can occur with or without human intervention.

Nowadays, a similar idea of breach of the ordinary course of biological nature seems involved in people's repugnance for highly processed food, sometimes referred to as the "yuk factor" (Midgley 2000; Siipi 2008, pp. 91–2). Yuk factor events are not reactions to the mere fact that some products are human-made (i.e., that they are **unnatural$_2$**). Processed foods are perceived as artificial in the much deeper sense that they involve types of transformations or modifications which seem to lie outside the normal course of biological nature. For instance, if chemicals are added in food products to make them grow faster, be less prone to damage caused by insects or fungi, or simply to look better and last longer, when the chemicals used are not part of the normal biological processes characterizing the life cycle of these products, they will be viewed as less **natural$_3$**. A study by Rozin (2005) illustrates people's intuitive use of a concept of **naturalness$_3$** in the evaluation of the naturalness of a product. The study shows that the perceived decrease of naturalness is stronger in the case of *chemical* transformations than in the case of *physical* transformations. "Physical transformation" in Rozin's study denotes changes that do not alter the inner properties of the products involved, e.g., freezing water, grinding peanuts, or squeezing oranges, whereas "chemical change" denotes the opposite, e.g., boiling water, adding fat to peanut butter, pasteurizing, or irradiating milk. Such perception points to a distinction between, on the one hand, **natural$_3$** changes, that is, changes that do not alter the inner natures of the substances and entities involved, and which could happen through the normal course of the organic world, and, on the other hand, **unnatural$_3$** transformations, that is, alterations that denature the substances and entities involved by exposing them to processes of change that do not normally occur in the organic world. The legal definitions of "natural food," in terms of processes mentioned at the beginning of this entry, also seem to involve such an opposition between chemical and physical processes of transformation.

Attfield (2006) defends the relevance of the **natural$_3$** for health-related issues. He argues that

> [T]he *good* and equally the *harm* of a living organism depend on its nature. If we did not know the nature of an organism, we could not tell what constituted its good or its harm. This is not just to say that the concepts of good and harm are species-specific; it is to say (unsurprisingly enough) that grasping the good or harm of a creature involves some grasp of its inherited constitution or make-up. (Attfield 2006, p. 111).

Attfield's contentions seem plausible. It appears reasonable to say that it is good, at least *prima facie*, for a being to grow and develop according to its nature. The standards of health for a living being depend on the kind of being it is; and as pain has plausibly evolved as a means to motivate animals to move away from things that threaten their life and health, it seems reasonable to think that, even for animals, there is a strong correlation between their well-being and what concurs with their natures. One possibly problematic case, however, is that of organisms of highly modified species (modified either through selective breeding or genetic engineering). If, in order to maximize profit, the genetic form of a species is selected in a way that it makes it painful for its members to grow according to their (human-modified) **nature$_3$**, then the correlation between **naturalness$_3$** and well-being disappears. For instance, in the previous 40 years, milk yield per dairy cow has more than doubled due to genetic selection. As a result, declining fertility, increasing leg and metabolic problems,

and declining longevity have been observed. These are for the most part attributable to selection for increased milk yield and indicate a substantial deterioration in cow welfare (Oltenacu and Broom 2010). Today's dairy cows, then, are victims of their own **natural$_3$** growth processes, with individual cows prone to suffering without any further outside human interference.

From the perspective of the human food consumer, it may be healthier to eat **natural$_3$** food. Food whose production and conservation has involved significant chemical interference to normal biological processes is likely to be more harmful to health, if, as it often revealed to be the case, the chemicals involved have significant levels of toxicity for humans. However, if the chemicals involved kill some germs that are pathogens for humans, then their consumption will presumably be healthier than that of **natural$_3$** food products. Hence, there might be trade-offs involved when assessing the relation between **naturalness$_3$** and human health. One could nevertheless argue that, in general, given that the dangers related to **natural$_3$** food are easier to assess and predict than those of foods with chemical additives, in the absence of contrary information, **natural$_3$** food should be preferred. The harmful effects of biological pathogens are usually observable quickly enough after consumption so that a correlation can be drawn between them and their harmful effects. This is not the case with the harms related to chemical additives, which are less easily tractable and sometimes become visible only long after someone has been exposed to them. For instance, exposure to pesticides is an important environmental risk factor associated with cancer development, but its effects can appear years after exposure.

What about the case of GMOs? Genetically modified organisms, sometimes denigrated as "frankenfoods" by their detractors, are often said to be unnatural because they "cross the species barrier." This idea of a "species barrier" seems to resonate well with the **nature$_3$** concept, as this concept is tied to the Aristotelian idea that species have essences which define their identity. Evolutionary biology, however, imposes qualifications to such idea. As it has been emphasized by biologists and philosophers of biology (Sober 1980; Mayr 1959), this sort of essentialist thinking about species is disqualified by evolutionary biology. According to Darwinian biology, species are not eternal essences, but concrete lineages in a perpetually ongoing process of change. Hence, in a Darwinian biological world, there are no sharp species barriers, and in this context, the argument that GMOs are unnatural because they cross such barrier is a nonstarter. Thus, if one wants to make the argument that GMOs are **unnatural$_3$**, one should point to other sorts of deviations from the normal course of the biological world involved in genetic engineering.

A counterargument to the idea that GMOs are unnatural is the picture of genetic engineering as simply an alternative way to achieve what evolution does all the time: creating and selecting biological variation. According to this line of reasoning, genetic engineering involves nothing significantly different from artificial selection through repeated crossbreeding, a practice presumably as old as farming itself; and crossbreeding is itself equivalent to natural selection, as both use essentially the same processes (the selective pressures being the preferences of the breeder in the case of crossbreeding). But some would disagree with the view that there is no significant difference between genetic engineering and selective crossbreeding. In a biologically well-informed discussion of genetic engineering, Vandana Shiva (2000, p. 13) emphasizes important differences between the two practices: "[u]nlike conventional breeding, genetic engineering recombines genetic material from different unrelated species which do not interbreed in nature and for which there is no, or very little, probability of natural progeny." As she illustrates, "conventional breeding does not transfer genes from bacteria and animals to plants. It does not put fish genes into potatoes or scorpion genes into cabbage. It crosses rice with rice, and wheat with wheat." Hence, Shiva identifies ways in which genetic engineering achieves changes that could not occur normally in the biological world. Traditional crossbreeding faces the exact same

constraints as natural reproduction, while the technique of recombinant DNA allows GMO producers to get around these constraints and achieve genetic combinations which could not occur through normal evolutionary processes. GMO plants like the soy contained in Kashi cereals are now commonplace illustrations of such combinations, but research is currently being done on genetically modified animal products (though none are on the market yet). One is the AquAdvantage salmon, an Atlantic salmon in which genes from a Pacific Chinook salmon and an ocean pout have been added in order to make it grow year-round and for the fish to reach market size in half of the time required for its non-modified counterpart (16–18 months rather than 3 years). Some modifications also involve human genetic material. In order to produce an alternative to infant formula, which is often criticized as being an inferior substitute to human breast milk, Chinese scientists have recently introduced human genes into 300 dairy cows to give their milk the same properties as human mother's milk.

Thus, although the "species barrier" argument is problematic in the light of Darwinian biology, there may still be good reasons to categorize GMOs as **unnatural$_3$**.

Ecological Naturalness

Daston (2010) distinguishes two versions of naturalness as biologically normal: *specific* natures and *local* natures. *Specific* natures refer to the essences or the kinds of entities, that is, "to what makes an object be itself, in a recognizable and distinct way, to its ontological identity card: what makes gold is gold (and not copper for instance), what makes a bear is a bear (and not a trout)." This version of the natural as the biologically normal is the Aristotelian one, which was the focus of the previous section, and sets the standard of normality at the level of the living organism. The other version of naturalness as the biologically normal depicted by Daston is that of *local* natures. As she defines them, the local natures are the "characteristic combination of the flora and fauna, of the climate and geology which confer a landscape its physiognomy: the desert oasis, the tropical forest, the Mediterranean cost or the heights of the rocky mountains" (Daston 2010, pp. 248–9). Daston adds that "[t]he modern science of ecology studies the way in which organisms and topography interact to create the distinct local natures; but the order of local natures was noticed long before the birth of this science" (Daston 2010, p. 249). According to this concept, "nature" refers to "the ecological world," and "natural" denotes what is in harmony with the ecological world, or, in more technical terms, what promotes, or at least is not detrimental, to what some ecologists call ecosystem health (Dussault In prep.). This ecological concept forms a fourth concept of naturalness which will be referred to as **natural$_4$**.

The intuitive idea that the ecological world has an inherent balance which human industrial activities often upset is central to ecocentric views in environmental ethics (Leopold 1949; Callicott 1999, 1989), although it has been observed that the idea of a *balance of nature* may require qualifications (Callicott 2003, 1999; Botkin 1990). According to such views, some food production practices may be deemed unnatural in the sense of unecological (**unnatural$_4$**). A study by Verhoog et al. (2003) illustrates the intuitive appeal to a concept of **natural$_4$** made by organic farmers and organic food customers in their characterization of organic farming as more natural than industrial farming. The respondents in Verhoog et al.'s study said that it was necessary to view nature not "as a mechanistic material system but as a complex organic living whole" which has "a self-organizing capacity." Moreover, although the respondents "[a]ll realized that farming as such is a cultural activity in which human beings interfere in nature," they nevertheless thought that somehow organic farming is "harmoniously integrated into nature," while conventional farming is not (Verhoog et al. 2003, pp. 35–8). The respondents' acknowledgement that farming is a cultural activity shows that the concept of naturalness they have in mind is not the **natural$_2$**, which excludes in principle humans' cultural

activities; and their depiction of human interventions in nature as more or less in harmony with it clearly suggests a concept of ecological naturalness.

Just like the concept of **naturalness$_3$** had immediate connections with the issue of human and animal health, the concept of ecological naturalness is directly tied to ecological issues. As this concept is defined as what is harmonious with the healthy functioning of ecological systems, what is natural in this sense should be expected to be good from an ecological standpoint. However, substantive questions remain about whether particular food production techniques, such as irrigation or the use of GMOs, are (un)natural in this sense. Is irrigation ecologically equivalent to rain (presumably a **natural$_4$** phenomenon)? Are GMOs always a threat to ecosystems? The complexity of ecological dynamics implies that giving definite answers to such questions an uneasy task. Nevertheless, some clearer answers can be found when one considers how these food production practices are *currently* implemented. Irrigation plays a crucial role in increasing crop yields and stabilizing production but also causes major environmental problems (Dougherty and Hall 1995). Meanwhile, GMOs initially supposed to free agriculture from chemicals are in fact used to bolster the chemical industry (Food and Water Watch 2013; Shiva 2000).

The connection between ecological naturalness and human and animal well-being issues is less straightforward. As humans and nonhuman animals can only thrive in healthy ecosystems, the goals of human and nonhuman well-being and that of ecosystem health seem to meet in the long term, but whether there are trade-offs between them in the short term remains an open question. Organic farming has been criticized as requiring more land to produce less food than conventional methods. The green revolution has contributed to a reduction in hunger in Asia; between 1970 and 1975, cereal production doubled, while land under cultivation only grew by 4 %. Can organic farming feed the world? There is no clear consensus on this question (McWilliams 2009, pp. 55–61). According to a recent meta-analysis of 66 studies presenting comparisons of organic vs. conventional agriculture yields (Seufert et al. 2012), organic agriculture yields are typically lower than those of conventional agriculture, but these differences vary depending on the system and site characteristics and on the types of plants grown. The study reveals large organic vs. conventional yield differences for cereals and vegetables (−26 % and −33 %, respectively) and small ones for fruits and oil seeds (−23 % and −11 %, respectively). The study also observes that organic and conventional yields are more equal when best organic management practices are used (−13 %) and when organic legumes or perennials are grown on weak-acidic to weak-alkaline soils, in rain-fed conditions (−6 %).

One final observation about the concept of ecological naturalness concerns its relationship to **naturalness$_3$**. It may seem intuitive to suppose that if some food production involves a great deal of chemical transformation – thereby making it **unnatural$_3$** – this will also make it unnatural in the ecological sense. Some remarks by Odum (1971) on how ecological science should inform our food production practices, however, suggest that processed foods may sometimes be natural in the ecological sense:

> Present agricultural strategy is based on selection for rapid growth and edibility in food plants, which, of course, make them vulnerable to attack by insects and disease. Consequently, the more we select for succulence and growth, the more effort we must invest in the chemical control of pests; this effort, in turn, increases the likelihood of our poisoning useful organisms, not to mention ourselves. Why not also practice the reverse strategy—that is, select plants that are essentially unpalatable, or that produce their own systemic insecticides while they are growing, and then convert the net production into edible products by microbial and chemical enrichment in food factories? We could then devote our biochemical genius to the enrichment process instead of fouling up our living space with chemical poisons! (Odum 1971, p. 269).

The first "Frankenburger," made from lab-grown meat and consisting of stem cells that were placed in a medium to grow and reproduce and then bound together by Prof. Mark Post's team in Maastricht, was recently served at a press conference in London. Compared with conventionally raised livestock, large-scale

production of cultured meat would reduce water, land, and energy use, as well as emissions of greenhouse gases. In vitro meat production may also decrease contamination with bacteria like *Salmonella* and *E. coli*, by eliminating contact with animal feces.

Another possible point of divergence between the **natural$_3$** and the **natural$_4$** concerns the debate over the (un)naturalness of vegetarianism. Usually, this debate centers around the question of whether our species has evolved to be herbivorous or omnivorous. This is a question about the **naturalness$_3$** of vegetarianism, that is, about the evolved normal capabilities of our species' digestive organs. From an ecological standpoint, however, what past evolution has made us physiologically capable of should not dictate what should or must be done. What matters in this case is what our species must *now* do to live in harmony its supporting ecosystems. It has been clearly shown that the earth's ecosystems will not be able to support the growing human population if we all eat meat (McMichael et al. 2007). Thus, insofar as we are able to live healthy lives on vegetarian diets, doing so may well be what is ecologically natural (**natural$_4$**) for us to do. This is indeed why ecocentrists like Callicott (2002) have emphasized the ecological reasons for vegetarianism:

> Much of the plow land in midwestern United States is devoted to feed crops, such as corn and soybeans, most of which are eaten not by human beings, but fed to factory farmed cows, pigs and chickens. Animals burn about 90 percent of the food they eat and convert the rest (only 10 percent at best) to meat, so Americans would need only about 10 percent of the land now under cultivation to grow food if we consumed grains and legumes directly and altogether eliminated mass-produced meat from our diets. The elimination of industrial animal agriculture would, therefore, make millions of acres available for prairie restoration on a truly grand scale. (Callicott 2002, p. 319).

Summary

Four concepts of naturalness have been defined and discussed:

Natural$_1$: What happens according to the basic laws of physics? Natural as opposed to *supernatural* or *miraculous*.

Natural$_2$: What happens independently of human voluntary agency? Natural as opposed to *artificial* or *human-made*.

Natural$_3$: What happens according to the normal or ordinary course of the organic world? Natural as opposed to the *monstrous* or *biologically abnormal*.

Natural$_4$: What stands in harmony with the ecological world? Natural as opposed to *unecological* or *ecologically harmful*.

Natural$_1$ includes anything physically possible and so fails to draw a useful distinction between natural and unnatural foods. **Natural$_2$** seems at first sight to capture the intuitive natural/unnatural food distinction, but reveals problematic upon closer analysis for three main reasons: (1) It sets humans outside of nature when doing so is incompatible with Darwinian biology; (2) it is too restrictive when understood as an *all-or-nothing* affair, as almost all sorts of food involve human transformations, and (3) it faces a problem of threshold arbitrariness when understood as a *continuous gradient*. **Natural$_3$**, by drawing a distinction between biologically normal and abnormal processes, seems better suited to account for the intuition that highly processed and genetically engineered food is unnatural, and to justify, to some extent, the intuition that natural food is usually safer and healthier. **Natural$_4$** resonates with the common observation that some food production practices like organic farming are more natural in the sense that they are in better harmony with and less harmful to the ecological world.

This classification confirms the polysemous character of the term "natural" but at the same time reveals that this polysemy does not preclude the notion from being helpful in discussions of food ethics. Two concepts of naturalness, **natural$_3$** and **natural$_4$**, have been shown to have some relevance for issues central to this field, like animal welfare, human health, and environmental ethics. Indeed, many particular questions about the value of natural food remain when looking at specific issues discussed in those fields.

Cross-References

- Food Labeling
- Food Risks
- GM Food, Nutrition, Safety, and Health
- GMO Food Labeling
- In vitro Meat
- Metaphysics of Natural Food
- Permaculture
- Responsible Innovation in the Food Sector
- Sustainability and Animal Agriculture
- Synthetic Meat
- Transgenic Crops
- Vegetarianism

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Nietzsche and Food

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Introduction

Friedrich Wilhelm Nietzsche (1844–1900) was a German philosopher who is quoted as often as he is misunderstood. He is well known for his ideas of the "superman" (*Übermensch*), the "will to power," and the "eternal return of the same," along with his many quotable passages, chief among them is the proclamation that "God is dead." It would be incorrect, however, to reduce his work to these ideas or even to take them as emblematic of his philosophy. This is no place to engage in a debate over Nietzsche's philosophical contributions and importance, but a few key (but by no means comprehensive) themes in Nietzsche's thought will help to guide the reader through Nietzsche's language of alimentation and digestion.

The theme of (1) "health" expresses Nietzsche's positive valuation of practices and attitudes that affirm life and the power of individuals ("free spirits") and cultures to grow and transform. Unhealthy individuals or cultures are weak, passive, and "decadent" in Nietzsche's vocabulary. The process of decadence and weakening over the course of Western history is what Nietzsche calls (2) "nihilism," the realization that there are no more absolute values or irrefutable truths. The utter radicality of Nietzsche's thinking replaces truths or facts with (3) "interpretation" – Nietzsche's desire to perform a "transvaluation of all values" is not simply a desire to replace the Christian values of his day with different ones, but rather the full commitment to life as a process of becoming, to live as if no values were absolute and to understand value as the result of a creative and interpretative process. To be a "free spirit" and live with health, strength, and vital force denotes the ability to give oneself over to self-transformation – a process Nietzsche equates with healthy digestion.

Food and Diet in Nietzsche's Life

Nietzsche's own struggles with illness throughout his life shape his writing and philosophy. As per the common medical practice of the time, which often identified an illness' cause and treatment in the stomach (Weineck 2006, p. 37), he attributes his various health problems to diet and in response often indulges his family's propensity for homeopathic cures. Even though the famous physician Professor Oppolzer of Leipzig diagnoses his illness as cerebral and not gastric, Nietzsche commonly rejected the advice of doctors who suggested treatments that limited his intellectual activity; instead, he favored dietary remedies and treatments for his stomach: his long-time doctor friend Professor Immermann in

1875 prescribed silver nitrate and, upon its failure, high doses of quinine (which a friend remarked constituted "experiments on [his] poor stomach") (Young 2010, p. 207); soon after, upon his arrival at a clinic in Steinbad, he placed himself under the care of Dr. Joseph Wiel, a cookbook author and doctor of questionable skill, who prescribed daily cold water enemas, four small meals per day comprised mostly of meat, and food cooked only in enameled pots – "no water, no soup, no vegetables, no bread" as Nietzsche remarks in a letter to Marie Baumgartner (Young 2010, p. 208).

While there is disagreement as to the proper diagnosis of Nietzsche's various ailments, his stomach problems were most likely caused by irritable bowel syndrome, a condition that persisted for his entire life (Young 2010, p. 209). Nietzsche's own obsessiveness over diet and gastrointestinal health explain in some measure why the stomach was so central to his philosophical notions of an individual's or culture's health. Moreover, it is important to note that while in his early thinking moral health leads to physical and psychological health, this causality is reversed in his later thinking, such that moral and psychological health are taken as the good effects of physiological well-being (Young 2010) that has its root in the processes of alimentation and digestion.

Here Is the Man and His Diet

Perhaps the clearest and most direct account of Nietzsche's own dietary habits and beliefs can be found in his autobiographical work *Ecce Homo*. This text arrives at the end of Nietzsche's intellectual production and provides a comprehensive dietary lens through which to view Nietzsche's mature philosophy. The stomach is the origin and cause of physical *and* spiritual (read: intellectual or cultural) well-being, even though they are never reduced to the body's health. This hierarchy marks a reversal of the traditional dominance of the spiritual (and the visual) over the bodily (and the gustatory). Unhealthiness is marked by decadence and decay, an inability to digest properly (dyspepsia), or an inability to convert what is digested into an intellectual or cultural transformation. Nietzsche claims he is not a decadent because he knows what to eat when he is ill; unlike the rest of society, he is able to digest and forget (Nietzsche et al. 2005, p. 76) and views himself as a living example of the positive, life-affirming qualities that distinguish the strong and vital spirit from one that is passive, weak, and unable to give itself over to transformation.

Nietzsche's dietary prescriptions for overcoming the weight of these traditions and for discovering a life-affirming power are, as his biography suggests, equal parts real and metaphorical (or, as is perhaps better suited to his philosophy, one that problematizes the distinction between the two). He cautions that he is too easily affected by wine and spirits (in vino veritas makes little sense once the idea of truth is rejected) and prefers drinking water out of running fountains (Nietzsche et al. 2005, pp. 86–87). He opposes vegetarianism; does not recommend long, protracted meals; avoids snacking between meals; shuns coffee; and only drinks tea in the morning. He refers to these prescriptions as his "morality," which includes the suggestion that one must "be *aware* of the size of your stomach" and choose hearty meals rather than ones that are too small because digestion involves the entire stomach (Nietzsche et al. 2005, p. 87). Of all diets (and cultures), he is most critical of the Germans, for "the German diet bears the weight of guilt (what doesn't it have on its conscience!). . .German spirit is indigestion, it is never through with anything" (Nietzsche et al. 2005, p. 86).

Nietzsche views his own reading and writing through the lens of gastric health. One needs a "joyful belly" to read Nietzsche and to digest his "life-transforming" books (Nietzsche et al. 2005, p. 90). Those who remain silent and do not write transformative books like his are dyspeptic – lacking discernment in judgment and taste (the democratic spirit) – they swallow everything but do not properly digest it (Nietzsche et al. 2005, p. 80). This unwillingness and inability to change – the clinging on to worn out ideas of morality and culture – are the telltale signs of decadence, of the life-destroying power from which society must be saved. For Nietzsche

it is a question of *nutrition*, for "the 'salvation of humanity' is much more dependent on this question than on any theological oddity" (Nietzsche et al. 2005, p. 85). If nihilism is the long, slow, decadent decline of Western, Judeo-Christian values whereby all ultimate values are shown to be baseless, any recovery from or overcoming of that condition – what Nietzsche refers to as an active or accomplished nihilism – requires first and foremost a healthy body that can incorporate the foreign and partake in a continual process of self-transformation. Nietzsche suggests that nutrition, the practices that support life-affirming forces and engage the process of becoming and transformation, requires an unapologetic embracing of one's own identity rather than a conception of self that is shaped by the herd mentality of prevailing cultural values.

A Critique of Modern Dyspepsia

For Nietzsche, the digestive process is analogous to the intellectual process of understanding and interpretation, with dyspepsia indicative of the individual or culture that consumes knowledge but does actively metabolize it in a transformative way. Knowledge is not simply some fact or idea "out there" in the world, but something brought to consciousness and understood within the context of one's own life – to know is to interpret experience in a manner fitting to one's own perspective. In his second *Untimely Meditation*, Nietzsche first utilizes digestive language to describe modern culture's unhealthy relationship with its own past as "a huge quantity of indigestible stones" of knowledge "consumed for the greater part without hunger" and no longer received "as an agent for transforming the outside world." Such a culture will "perish of indigestion" (Nietzsche and Hollingdale 1997, pp. 78–79). In this early work, Nietzsche views the moral and spiritual health of an individual or society as the cause (not yet the effect) of its "bodily" health and vital energy – if one is morally and spiritually healthy, one can approach knowledge of the past as a cure and an aid to well-being; if taken in the wrong manner, however, knowledge becomes a culture's "historical illness."

In the years 1876–1879, Nietzsche's struggles with his own illnesses are accompanied by an increase in gastro-rhetoric. In *Human, All Too Human*, Nietzsche casts his own work in the light of a healthy stomach: "Writing ought always to advertise a victory—an overcoming of *oneself* which has to be communicated for the benefit of others; but there are dyspeptic authors who write only when they cannot digest something" (Nietzsche and Hollingdale 1996, p. 248). In terms of lived experience, he comments that "everyone nowadays lives through too much and thinks through too little: they are ravenously hungry but at the same time suffer from colic (dyspepsia), so they get thinner and thinner however much they eat.—He who says nowadays 'I have experienced nothing'—is an idiot" (Nietzsche and Hollingdale 1996, p. 360). The key to experiencing life is not a distanced, objective, or even scientific reflection on it; rather, the experiences of life nourish thought, while, in a reciprocal manner, thinking enriches and transforms the experience of life: "For as long as one is experiencing something one must give oneself up to the experience and close one's eyes: that is to say, not to be an observer of it while still *in the midst* of it. For that would disturb the absorption of the experience: instead of a piece of wisdom one would acquire from it indigestion" (Nietzsche and Hollingdale 1996, pp. 385–386). "Wisdom" is the product of healthy digestion and transformation into life rather than the mere consumption and preservation of life's experiences.

A telling illustration of the connection between good digestion and vital, transformative energy can be found in Nietzsche's critique of modernity and, most notably, his critiques of selfless, Christian moral values and the "herd" mentality of modern democracy and socialism. In a decadent society, "modern man understands how to digest many things, indeed almost everything," but in a manner that does not transform him inwardly, but only reduces the external world to consumable material – he is "*homo pamphagus*" (Nietzsche et al. 1997, p. 104). Nietzsche is also skeptical of pessimists and

misanthropes unwilling to embrace the transformative potential of human creativity. Any deep dissatisfaction with existence is usually caused by "some great dietary mistake made by people over a long time" (Nietzsche et al. 2001, p. 124); and the misanthrope "speaks of being sick of people only when one can no longer digest them and yet still has one's stomach full of them" (Nietzsche et al. 2001, p. 135). These images of the undisciplined eater who lacks a discerning sense of judgment or taste is perhaps the most common of all Nietzsche's gastric tropes.

Nietzsche's allegory *Thus Spoke Zarathustra* continues this critique of weak, modern individuals. On the one hand, they represent the herd and the rabble, those without discerning judgment who "are always sick, they vomit their gall and call it the newspaper. They devour one another and are not even able to digest themselves" (Nietzsche 2006, p. 35). In this inability to judge, however, one simply becomes omnivorous and devours everything: the "all-complacent . . . knows how to taste everything—that is not the best taste! I honor the obstinate, choosy tongues and stomachs, which have learned to say 'I' and 'Yes' and 'No.' But chewing and digesting everything—that is truly the swine's style! To always say hee-yaw—only the ass learned that, and whoever is of its spirit!—" (Nietzsche 2006, p. 155). If one wishes to be a free spirit able to undergo a transformation, one must protect the stomach by eating what is best and not what is most available: "their spirit is a ruined stomach: *it* recommends death! Because truly, my brothers, the spirit *is* a stomach!" (Nietzsche 2006, p. 165). Such a spirit is ready for transformation and the break with tradition, which requires taste, judgment, and critique. Zarathustra criticizes the beggar whose stomach "resists all such raging and hating and foaming over. Your stomach wants gentler things: you are no butcher. Rather, you seem to me a vegetarian and a root man" (Nietzsche 2006, p. 219). This last image not only seems to confirm Nietzsche's suspicion about vegetarians but also rejects those who are slow to change and cling to tradition.

Nietzsche believes that European culture in the nineteenth century, and most notably German culture, promotes traditional moral ideas that are hostile to life-affirming change and transformation. These false "free spirits" of Europe have "teeth and stomachs for the indigestible" (Nietzsche et al. 2002, pp. 41–42) and like any herd has a "crude appetite" for whatever is shoved down its throat. Their narrow-mindedness is equated to a slow speed of digestion, and Germans in particular digest in a slow, hesitating manner (Nietzsche et al. 2002, pp. 132, 135). In *On the Genealogy of Morality*, Nietzsche claims the healthy individual can forget and digest, while those who cannot forget or shut off their digestion are "like a dyspeptic—he can get rid of nothing, cannot metabolize it" (Nietzsche et al. 1998, p. 35). Such individuals also misinterpret the origin of "bad conscience" or guilt – understanding its true origin (in material culture, rather than the soul) requires "digestions" and "meditation." Nietzsche's entire critique of modern morality, and his belief in the "untimely" nature of his critiques, might be summed up in the following image: "We have probably all sat at tables where we did not belong; and the most spiritual among us (who are the most difficult to feed), are familiar with that dangerous dyspepsia that comes from a sudden insight into and disappointment over our food and dining companions,—the *after-dinner nausea*" (Nietzsche et al. 2002, p. 170). Even though his society is in decline, Nietzsche's understanding of nihilism (the baselessness of all values) allows him to redeem humanity through its continual transformation – a process that requires an ability to digest what is other and interpret it in light of one's own transformative perspective or "will to power."

The Free Spirit of Digestion

If the two flaws of modernity find their alimentary expression in the inability to digest, and in a ravenous but undiscerning appetite for various forms of knowledge, Nietzsche's remedies are expressed through a vital ability to digest, metabolize, and incorporate what is foreign and through a discerning dietary judgment known as "taste." This is not merely a matter of nutrition or

aesthetics, but promotes a direct causality between the gastrointestinal health of the body and the spiritual health of an individual or society. Near the outset of *The Gay Science*, Nietzsche asks "Do we know the moral effects of foods? Is there a philosophy of nutrition?" to guide the growth of individual and shared life (Nietzsche et al. 2001, p. 34). Nietzsche not only suggests a reversal of traditional mind-over-matter causality but implicitly rejects any reduction to an absolute causal relation one way or the other. Nietzsche is, above all, simply concerned with the way that power is expressed in human life – the stomach is but one way of illustrating that expression.

For this reason, Nietzsche is able to admire the powerful origins of individuals and institutions he often condemns. In their early, non-decadent forms they illustrate a will to power and vitality of life through the processes of becoming and transformation, such as one finds in "the astonishing crudeness and self-satisfiedness of the church's intellect during the time it was in process of formation, which permitted it to accept *any food* and to digest opposites like pebbles" (Nietzsche et al. 1997, p. 42). The strong stomach is an organ that allows one to endure pain and transform life's insipid repast (Nietzsche et al. 1997, p. 166). Invoking an image that also appears in *On The Genealogy of Morality*, Nietzsche's Zarathustra reflects: "My stomach—it must be the stomach of an eagle? Because what it loves best is flesh of lamb. Certain at least, it is the stomach of a bird. Nourished by innocent things and by a little, ready and impatient to fly, to fly away—that is just my way" (Nietzsche 2006, p. 153). This digestive freedom constitutes a very particular sort of power, as it is open to otherness and yet (somewhat paradoxically) unabashedly egoistic. Digestion in this sense constitutes a form of interpretation: one does not merely passively accept and become what is taken in; nor does one actively destroy and assimilate the other completely into oneself. The model here is reciprocal, with the healthy eater allowing herself to be transformed only to the degree that the process is also transforming and shaped by the eater; and through that transformation, the other and the self are metabolized, literally, thrown-beyond themselves into something new. Artistic or cultural creation (great works, new paradigms, moral values, etc.) is not ex nihilo, but arrives through process of incorporation and transformation that is an interpretation or, in Nietzsche's more popular terminology, an expression of "will to power."

The ability to create in this way – an act that ultimately constitutes a form of interpretation guided by a hierarchical (re)ordering of values – relies on a certain degree of taste, an ability to judge, and carefully select what one ingests and what one allows to participate in the transformative metabolism of the self. This ability to discern and judge arises from a certain mode of life, the nourishment and diet of the "tastemakers" (Nietzsche et al. 2001, p. 56). Nietzsche claims that "you must eat, not only with your mouth, but also with your head, so that you shall not perish by the mouth's love of sweetmeats" (Nietzsche and Hollingdale 1996, p. 278). More than a heightened cultural or artistic sensitivity, there is a level of rational control over what and how much one takes in: rather than coming to the table hungry and at the mercy of one's appetites, one deals with people and one's society as if one were building trust in a kitchen whose cook is unfamiliar (Nietzsche et al. 2001, p. 229). In an aphorism (displaying Nietzsche's not uncommon misogyny) entitled "Stupidity in the Kitchen," Nietzsche claims that women have no knowledge of philosophy and the effects of food. The stomach, like the soul, should be guided by our reason and discerning will rather than by the loss of its control (Nietzsche et al. 2002, pp. 125–126). These thoughts do not promote rationalism, a tradition in philosophy that Nietzsche clearly opposes; yet, Nietzsche is not simply an irrationalist who wishes to relinquish the will to passivity and emotion. One could argue that for Nietzsche, a healthy will is guided by active and egoistic reasons and motivations – an unapologetic confidence is one's own tastes and ways of doing things.

This thinker or "free spirit" lives on poor fare, like a dancer: "There is no formula for how much a spirit needs for its nourishment; but if it has

a taste for independence, for quick coming and going, for wandering, perhaps for adventures of which only the swiftest are capable, it would rather live free with little food than unfree and stuffed" (Nietzsche et al. 2001, p. 246). Nietzsche is not advocating, however, a life of the ascetic (whose complete restrictiveness undermines good digestion, as he points out in Treatise III of *On the Genealogy of Morality*). One has to understand how much and what sorts of food to ingest, which virtues and ideas to accept, and which ones to reject: "Each of these choices—of nutrition, of location and climate, and of recuperation—is governed by an instinct for self-preservation that is most clearly expressed as an instinct for *self-defence*. . .. The usual word for this instinct of self-defence is *taste*" (Nietzsche et al. 2005, p. 95). Nietzsche does not propose a simple reduction to Darwinian self-preservation; rather, the "free spirit" validates his own perspective or interpretation through its defense, through a desire to be uncompromising and often untimely.

Is the Stomach the Heart of Nietzsche's Philosophy?

For Nietzsche, a healthy and vital digestive power involves a discerning openness to new ideas and an ability to incorporate those ideas in a process of becoming: "all of which are necessary in proportion to the degree of its appropriating force, its 'digestive force,' to speak metaphorically—*and really*, 'spirit' resembles a stomach more than anything" (my italics, Nietzsche et al. 2002, p. 122). Nietzsche certainly problematizes the line between the real and the metaphoric, as neither the spirit nor the body are simply "facts" or givens to be reckoned with. They are themselves modes or ways of interpreting the world that cannot be reduced to a purely physiological explanation of cultural and individual health: "A strong and well-constituted individual digests his experiences... If he 'cannot cope' with an experience, this kind of indigestion is just as physiological as that other one—and in many cases in fact only one of the consequences of that other.—With such a conception one can, speaking among ourselves, still be the strictest opponent of materialism" (Nietzsche et al. 1998, p. 93). This claim is, however, difficult to reconcile with the seemingly more materialistic and reductionist position Nietzsche takes in *Twilight of the Idols*: "It is crucial for the fate of individuals as well as people that culture begin in the *right* place—*not* in the 'soul' (which was the disastrous superstition of priests and half-priests): the right place is the body, gestures, diet, physiology, *everything else* follows from this..." (Nietzsche et al. 2005, p. 221). Such contradictions are not uncommon in Nietzsche's philosophy and in many ways point to the active and interpretative criteria to which he held even his own thinking.

Ultimately, should the metaphor of digestion be taken only as that – yet another rhetorical device employed by Nietzsche the writer to help illustrate, in a mode other than traditional philosophical argument, how humans relate to the cultural ideas that shape their social environment? Or should digestion be understood in a more literal and existential way – namely, as the physiological basis and source of human cultural production and self-understanding? The status of these digestive tropes is the subject of some academic discussion and mirrors a more general debate in Nietzsche scholarship over the degree to which Nietzsche is a materialist. In *Nietzsche: The Body and Culture*, Blondel argues that Nietzsche's gastric metaphors are themselves metaphors for interpretation, with interpretation itself serving as an ultimate yet circular principle through which new cultural ideas arise and old ones are either reincorporated or overcome in the "body" politic but not, however, reduced to the physical human body (Blondel 1991, p. 219). In the end, the strength of a culture is associated with its ability to change, grow, and be discerning about what it chooses to "incorporate." Nietzsche's metaphors of digestion are thus "a scheme with which to interpret culture as interpretation" (Blondel 1991, p. 229). Medeiros argues that, at least in the practice of reading in *The Gay Science*, devouring and interpretation are interchangeable. Medeiros criticizes

Blondel's strictly metaphoric interpretation and argues that politics, morality, and art should be viewed as extensions of physiological acts (Medeiros 1993, pp. 96–97). Weineck places Nietzsche's digestive tropes in the interpretative middle between consciousness and physiology, suggesting that Nietzsche "re-literalizes" digestion as spirit embodied, replacing Hegel's *Aufhebung* with a form of overcoming and becoming that by design resists its own completion and absolutization (Weineck 2006, pp. 37–39).

How to Become What You Eat

In the figure of digestion, Nietzsche undermines the mind-body distinction so that the process of interpretation is reduced neither to pure cognition nor to pure physiology, illustrating how to digest and metabolize the very distinction between body and mind and nature and culture. Digestion points to a hermeneutic circle of interpretation that, without any absolute foundation, is always on its way to the next interpretation, always in a process of becoming, always metabolizing. Nietzsche's autobiography *Ecce Homo* carries the subtitle "How to Become What You Are." In light of the maxims put forward by two other thinkers of the nineteenth century (Feuerbach's "you are what you eat" and Brillat-Savarin's "Tell me what you eat, and I will tell you what you are"), one could perhaps summarize Nietzsche's meditations on digestion, and perhaps the whole of his philosophy, with the revision: "how to become what you eat." Unlike his contemporaries, Nietzsche does not offer us a description of human existence and understanding nor even a prescription. Life – physical or cultural – always carries with it the risk that accompanies any ingestion, whether of food or ideas. To consume and digest, and thus to think and create, is (somewhat paradoxically) to assert oneself in the act of transforming into something other, to be open to otherness when becoming who one is.

Cross-References

- ▶ Food-Body Relationship
- ▶ Foucault and Food
- ▶ Gustatory Pleasure and Food
- ▶ Vegetarianism
- ▶ You Are What You Eat

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