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AGRICULTURAL ETHICS

INTRODUCTION

It is widely known that agriculture has a long history. Starting approximately 12,000 years ago, the domestication of plants and animals began independently in several different places, including centers in West Asia, East Asia, Central America, and South America. Domestication also may have occurred in other locations, although convincing archeological evidence has not been found. In the domestication process, humans manipulated animals, plants, and the environment in various ways to increase the availability of the desirable species and desired traits of these species (Anderson n.d.).

It is less widely known that religious, political, and philosophical reflection on agriculture and the environment also has a long history. Early in the Hebrew Bible (or Old Testament), God promised the children of Israel an abundance of land flowing with milk and honey (Deut. 3:8; 15:4); the Bible also prohibited the acquisition of small farms by large landowners (Lev. 25:13, as noted in Spiegel 1991). Centuries later, the Greek philosopher Plato discussed the importance of reconstructing agriculture after the mythical Deluge, and his student Aristotle

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TASK FORCE MEMBERS: Jeffrey Burkhardt, Chair, Department of Food and Resource Economics, University of Florida, Gainesville; Gary Comstock, Department of Philosophy and Religion, North Carolina State University, Raleigh; Peter G. Hartel, Department of Crop and Soil Sciences, University of Georgia, Athens; Paul B. Thompson, Department of Philosophy, Michigan State University, East Lansing; **REVIEWERS:** Maarten J. Chrispeels, Center for Molecular Agriculture, University of California–San Diego; Charles C. Muscoplat, College of Agricultural, Food and Environmental Sciences, University of Minnesota, St. Paul; Robert Streiffer, Department of Philosophy, Department of Medical History and Bioethics, Department of Medical Sciences, University of Wisconsin

commented on the importance of agricultural knowledge in the quest for the “good life” by the individual and the polity. The fundamental value of agriculture was highlighted by Enlightenment thinkers from John Locke to Thomas Jefferson, who underscored the political, economic, and philosophical importance of “tillers of the soil” (Spiegel 1991). In the United States, problems faced by farmers became the focus of the nineteenth-century Populists, and their legacy continues today. Suffice it to say that agriculture has long been the focus of

questions about values, priorities, practices, and policies.

In the late twentieth century, systematic thinking about the values and norms associated with the food system—farming, resource management, food processing, distribution, trade, and consumption—came to be referred to as *agricultural ethics*. Agricultural ethics incorporates elements of philosophical ethical analysis with concerns about particular *issue areas* that arise in connection with the food system. As practiced by philosophers and scholars from religious studies, the social sciences, and the agricultural disciplines themselves, agricultural ethics has grown from the work of a handful of philosophically trained individuals in U.S. land-grant institutions to a large, worldwide collection of academics, scholars, farmers, policymakers, and activists, thinking and writing about these issues. In this paper, the authors examine the nature of ethics as applied to agriculture (as well as the environment), discuss briefly how ethical concepts and

tools can address several issue areas in the food system, comment on how consideration of agricultural ethics might be institutionalized, and provide a glossary to help those interested in these issues navigate through the topic of ethics as applied to the world of agriculture.

ETHICS¹

Ethics, simply put, refers to the rightness or wrongness of actions. Persons, groups, or institutions act ethically when they do “the right thing,” and act wrongly when they do “the wrong thing.” Obviously, one of the first problems encountered when thinking about ethics is “What makes actions right or wrong?” This thinking is referred to as the problem of finding ethical standards or criteria.

In some people’s minds, right and wrong are defined by the laws a country enacts or adopts to protect life, liberty, or property. But the law is not always a good guide to ethics, because some activities are legal yet unethical (e.g., occasional psychological abuse of one’s spouse) whereas other activities are illegal and yet not unethical (e.g., driving over the speed limit in an emergency). Ethical criteria are distinct from the law, although laws frequently follow or embody certain ethical criteria (e.g., laws against murder or against “cruel and unusual punishment”).

Other people find the basis of ethics in customs or culture. But there are things certain people condone that are not ethically permissible on any rational criteria (e.g., torturing some citizens for the entertainment of the masses or engaging in slave trade). There also are activities some people engage in that are culturally “wrong” but not unethical (e.g., not removing one’s shoes when entering a traditional Japanese home). Clearly, there are connections between a culture’s customs and ethics, but general ethical standards cannot be based on customs. Customs and cultures vary tremendously around the world, and ethical criteria should be, at least in general terms, “universal.”

Yet other people want to base ethics on religion. Historically, ethics and religion have been aligned closely because the ethical values of many cultures have evolved within religious traditions. These traditions have been prime repositories, incubators, and champions of virtue and moral character. But what is ethically right or wrong is not necessarily identical to what a particular religion teaches. Indeed, religions conflict with one another over ethical obligations; for example, Hindus believe it is ethically wrong to kill cattle, whereas the Judeo-Christian tradition has no such prohibition (Linzey and Yamamoto 1998). Moreover, throughout history, religions have called on their adherents to engage in actions that, on

reflection even by believers, are ethically wrong: torture, genocide, and suicide are prime examples. Thus, although many ethical prescriptions and proscriptions may be taught and fostered through religions, there are ethical “rights” and “wrongs” that are independent of any religious tradition.

Historically, some thinkers have tried to base ethics on science (see Huxley [1888] 2001). The sciences are descriptive disciplines aimed at explaining and predicting natural laws and regularities that *in fact* govern the behavior and relationships of objects in the natural world. Ethics, on the other hand, is a normative discipline aimed at prescribing conduct and articulating moral rules or principles that *ought* to govern human behavior. There are scientific questions one can answer without having to think about ethics at all. Although few ethical questions can be resolved without accurate scientific information, ethics cannot be based solely on science (see Hume [1777] 1975). As most contemporary ethicists would put it, one cannot derive “ought” from “is.” Whether the issue is the legitimacy of government farm subsidies, the role of the international community in addressing issues of world hunger, or the safety of genetically modified organisms (GMOs), ethics demands that people come to answers about what they ought or ought not do, what it is right or wrong to do.

Now it is true that people have different opinions on farm subsidies, solving world hunger, and GMOs. When people disagree about such issues, they invariably invoke arguments, explicitly or implicitly, to support their opinions. Part of ethics, therefore, is the study of arguments—premises, conclusions, and the validity of moving from premises *a*, *b*, and *c* to conclusion *d*. Ultimately, a major goal of agricultural ethics is to discover or develop clear, noncontradictory, comprehensive, and universal standards for judging right and wrong actions and policies. By analyzing arguments and positions on ethical issues, one begins to develop a better understanding of the criteria or standards that should govern one’s actions and lead to judgments about what counts as ethically right and wrong.

A METHOD FOR ADDRESSING ETHICAL ISSUES²

Ethical arguments often center on “harms.” People are concerned about actual or possible harm to persons or other living beings from a given action or policy. Harmful actions may or may not be justified. Whether harms are justified is a question that ethicists try to answer by working methodically through a series of steps:

- What is the harm under consideration? How significant (tangible or intangible, severe or trivial) is the

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²This section is based on Comstock 2001, “Ethics and Genetically Modified Foods,” and is used with permission of the publisher.

actual or potential harm? Who are the stakeholders (i.e., the persons, animals, or even ecosystems that are or may be affected)? What is the extent to which various stakeholders might be harmed—that is, what is the distribution of harms? Are those who are at risk of being harmed by the action in question different from those who may benefit from the action in question?

These questions set the ethical stage, as it were, identifying an action or policy as a candidate for ethical argument and analysis. Also important, however, are what might be called “reality check” questions:

- What information do we have? Where did we get this information? Is the information we have about actual or possible harm(s) reliable and/or scientifically determinable? Is it hearsay or opinion? What information do we not have that we should have before making any decisions about the ethical rightness or wrongness of the action?

It also is important to note that some actions are unavoidable and some are not. This fact also affects the ethical analysis.

- What are the options? In assessing potentially harmful actions, are there alternative actions that would not produce such harms?

Finally, there is the question:

- What ethical criteria or standards should guide us?

There are three main secular ethical traditions, or what ethicists refer to as *theories* because they provide justifications/explanations. Whereas scientific theories justify/explain facts, ethical theories justify/explain the rightness or wrongness of certain kinds of actions.

1. Rights theory. This theory holds that individuals have rights (i.e., justifiable claims against others that others do or do not treat them in certain ways). Rights theory is based on the idea that individuals are entitled to not be harmed against their will—“harm” meaning both physical harm and damage to property and interests. If an action causes or will cause harm to individuals, rights theory declares this action unethical, and no benefits (or a very limited set of benefits) can override this determination.
2. Utilitarian theory. Utilitarianism is a “consequentialist” theory, which means that right and wrong are determined not by appeal to some absolute limit (e.g., rights), but by taking into account all the consequences of action. There are different interpretations of what counts as a good or bad consequence, but in its most general sense, utilitarianism holds that persons should always act to maximize beneficial consequences and minimize harmful consequences. As it is sometimes put: Ethical actions

produce “the greatest good for the greatest number of potentially affected living beings.” In practice, this usually means attempting to produce “net benefits”—more beneficial consequences than harmful ones. This “caveat” is based on the recognition that most (if not all) actions have some potentially harmful implications, even if unintended.

3. Virtue theory. This theory holds that ethically we ought to act in accordance with a set of ideals or character traits—the kinds of traits a just, fair, good person would exhibit through his or her actions. An action that either fails to follow these ideals, or puts other people in a position such that they cannot follow their ideals, is wrong. Indeed, not following virtues, or preventing others from following virtues, is harmful to oneself and others.

Ethical theorists differ about which of these three theories provides the best standard or criterion for judging right and wrong. Sometimes, differences are overcome using the following procedure. Choose one of the three theories; using it as a basis, determine its implications for an action about to be taken. Then, apply a second theory. Determine what it implies about the action. Repeat the procedure with the third theory. If all three theories converge on the same conclusion, there are good reasons to think that that conclusion is the ethically justifiable one. One example of this convergence would be all three theories agreeing that it is wrong for a government to inflict gratuitous pain on incarcerated individuals: it violates rights, provides no larger benefit, and is the opposite of virtuous—it is vicious.

More often than not, however, the three theories yield conflicting conclusions. An action that produces the greatest net benefits may, as an indirect (or even direct) result, violate some people’s rights or preclude others from acting virtuously. To protect the rights of individuals may preclude the achievement of some larger social benefit. For example, when a government takes pieces of several individuals’ property to widen a road for public safety, that action clearly violates rights but benefits the larger public (and the individuals).

Many issues associated with the food system arise from actions that are justifiable from the perspective of one ethical theory but clearly wrong from the perspective of another (Wojcik 1989). This is why they are referred to as *issues*: situations in which some people’s positions or arguments about what constitutes the right or wrong thing(s) to do are at variance with, and in conflict with, other people’s arguments. Sometimes these conflicts are heated; indeed, with so much at stake in the food system, it is important that an attempt be made—to borrow a cliché—to shed light where there has been only considerable heat. Agricultural ethics, as an analytical approach, can provide assistance in this regard.

TOPICS AND ISSUES

This paper has been referring to the focus of agricultural ethics as issues in the food system. The authors have discussed the nature of ethics and the kinds of ethical theories used to analyze arguments and evaluate actions, in decidedly philosophical terms. It is important to note that ethical analysis is only one of a number of disciplinary tools for discussing issues related to food, agriculture, and the environment. This comment is particularly important in this paper because, in a number of instances, only the ethical aspects or ethical theories are identified. There are sociological, economic, political, and legal dimensions to all topics discussed here. Moreover, there are basic biological, agronomic, horticultural, ecological, and physical dimensions as well. So in a discussion of several key issue areas of agricultural ethics, one must keep in mind that identifying an issue only as an “ethical issue” is too unidimensional.

The following sections focus on 10 topics that over the past 20 or so years have generated considerable public discussion and academic analysis: farm structure, animal ethics, food safety, environmental impacts, international trade, food security, agricultural biotechnology, research ethics, public trust in science, and the process of institutionalizing agricultural ethics. All are general topics, and a complete analysis is much more than can be presented here. (For a more thorough treatment see Blatz 1991.) Additional issue areas touched on briefly include food aid, consumer acceptance of novel foods, and organic farming; many other issues are ignored.

FARM STRUCTURE

Farm structure refers to the general social and economic features of agriculture in a given society. It includes elements such as the average size of farms, relative market shares of different-sized farms, numbers of people employed in farming, and whether or not farms are owner-operated. Farm structure in the United States underwent major changes during the past century. In 1900, most farms were owner-operated, smaller than 80 hectares (ha), and tended by family members and a few additional laborers. Agriculture employed nearly 30% of the U.S. population. By 2000, the number of farms and farm workers had decreased dramatically: fewer than 2 million farms employed fewer than 3% of Americans (Hoppe et al. 2001). Farm size increased to an average of approximately 200 ha. Although there remain many medium-sized, owner-operated (“family”) farms, U.S. farm structure now is “bipolar”—many small farms and a few large farms, the latter accounting for more than 80% of production and revenues for most commodities.

There are many causes of structural change. Improved farm technology allowed farm size to grow while improving efficiency and productivity. Better transportation allowed access to markets far from the farm gate.

And many young men who might otherwise have returned to the family farm after service during the World Wars and in Korea decided on careers away from farming. The GI Bill, significant increases in agricultural productivity, and the economic boom of the 1950s all contributed to the decline in farm labor. Gradually, farmland and commodity production became concentrated in fewer, larger enterprises.

Although these changes might be characterized easily as a “natural” economic adjustment, some observers claim that other forces brought and are bringing about the demise of the traditional family farm—farms operated by family members with perhaps one or two hired hands. For example, the U.S. government’s long-standing subsidy on the growing of tobacco, a major cash crop for small family farmers in the Southeast, was recently ended in part because of its inconsistency with the proven (and officially recognized) harmful health effects of tobacco. Some people argue that removing the subsidy will further contribute to the vulnerability of small farms.

Other observers, for example the so-called Agrarians or neo-Agrarians, suggest that agribusiness, with its focus on maximal profits, has significantly influenced technology providers (including land-grant universities), the government, and the financial establishment in ways that marginalized traditional family farms. Agrarians argue that serious ethical wrongs have been committed, and that it is now the responsibility of governments, corporations, universities, and consumers to help “save” the family farm and to ensure that individuals who want to become family farmers have the opportunity to do so (Berry 1977; Comstock 1987).

Agrarians fall into two major groups regarding their reasons for wanting to preserve and protect family farming. Some agrarians see family farms having value in utilitarian terms. Contemporary agrarian populists argue that thriving family farms are essential to the well-being of rural communities that both support and depend on them. Vibrant small towns, widely dispersed across America, are in turn essential to the decentralization of economic and political power, a prerequisite for a healthy democracy and free markets. There is an ethical responsibility to save family farms because the U.S. “Jeffersonian” political-economic system depends on them.

Other agrarians argue for the preservation of small family farms on more direct cultural and moral grounds. Agrarian traditionalists maintain that family farms promote and embody important moral values or virtues such as integrity, self-reliance, responsibility to community, and wholesomeness. Traditionalists hold that not respecting and not preserving these kinds of values and virtues undercuts our own moral and cultural heritage and spiritually impoverishes us. Perhaps not everyone can participate in a family farm enterprise or a rural community, but to allow government, technology, or other economic

forces to continue to contribute to the demise of family farms and rural ways of life is unethical on the grounds that people are being prevented from acting virtuously (Thompson, Matthews, and VanRavenswaay 1994).

Another issue associated with the structure of agriculture (globally) is the situation (and rights) of farm workers. Even with advancements in technology allowing farms to become ever larger while improving productivity, basic labor still is necessary for many crops. Although many farm workers are highly skilled and location-bound, the seasonal nature of harvest time has led to there being a class of farm workers who follow the work (i.e., migrant farm labor). One concern is that these migrant workers are usually uneducated, unskilled, and generally paid a minimal wage at best. Moreover, many are illegal aliens unable to escape this way of life even if they wanted to do so. Although labor law in the United States has begun to address the problem of what has been called “free-market slavery,” migrant farm workers’ conditions are another illustration of an ethical issue associated with farm structure (Griffith and Kissam 1995).

ANIMAL ETHICS³

The use of animals in agriculture raises many ethical issues. A few of the questions raised by the practice of producing animals for food are the following:

- As billions of people around the world seek to emulate the high meat-consuming diets of the developed countries, how long will the Earth’s natural resources be able to sustain an industrial agricultural system devoted to high-volume, low-cost, monoculture production of animal feedstuffs? How much land can 9 billion potential meat eaters spare for wildlife (Cohn 1999)?
- As demand for meat increases, will animal scientists genetically alter animals for “happiness” so the animals will be able to live in close confinement that their ancestors would have found intolerable (Rollin 1995, pp. 192–193)?
- To what extent will animal producers pay for environmental externalities such as soil erosion and loss of biodiversity in rangeland?

These questions focus on the nature and consequences of the system in which animals are produced for food, and arguments generally follow the utilitarian vs. rights script. Below the surface of animal ethics arguments, however, are differing views concerning the legitimacy of using animals for food, or for any other purposes, at all.

Answers to these questions will depend, in large part,

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on one’s views about the moral status of animals and humans’ responsibilities. For example, Dominionists believe that we may do whatever we please to animals; animals have value only as means to human ends, either because animals are not sentient (it is believed) or because they lack consciousness. Ethical issues in animal production arise only in contexts such as resource use or environmental impacts. Animal welfarists, on the contrary, believe that animals are sentient and that humans are their stewards. Animals can be harmed just as people can, and they can be benefited as well. Utilitarian ethics demands that we attempt to achieve a balance of humans’ and animals’ benefits and harms. Accordingly, genetically engineering “happy” farm animals may be ethically required. Animal rightists believe that animals have basic moral rights and therefore cannot be treated as mere means to others’ ends (Hursthouse 2000; Regan 1985). Extending the rights theory approach, animal rightists contend that because everything that occurs in animal agriculture harms animals or their interests, animal agriculture must be rejected out of hand.

FOOD SAFETY

Food safety is an ethical issue in part because, in the modern food production-transportation-processing-wholesaling-retailing chain, foods can be exposed to chemicals or microbial pathogens, or simply can be mishandled. In addition, the food system is not *transparent*; that is, consumers on their own may not know or be able to tell whether the foods they purchase and eat will put them at risk for sickness or disease or even allergic reactions. The complexity and lack of transparency of the production system leads to the need for U. S. federal agencies such as the Environmental Protection Agency and the Food and Drug Administration, as well as state or local agencies such as public health departments, to play an important role in ensuring food safety. Recall that the rights approach to ethics demands that people generally not be placed at risk against their will. On this view, governments have an ethical responsibility to ensure that rights are not violated and that food is therefore safe. One problem with this view is that determining food safety is not simple: “safe” implies a value judgment that potential hazards have been adequately analyzed and that any remaining risks are “acceptable” (NAS 2001). This judgment does not mean there are “no risks”; indeed, what makes food safety an ethically challenging issue is that sometimes risks must be allowed by government agencies and imposed on consumers because of a broader public safety goal. Once again, this issue may resolve into a utilitarianism vs. rights debate.

In light of occasional food scares and lapses in the regulatory system, certain questions have been raised about the appropriateness and thoroughness of many scientific risk analyses and assessments of safety. Some

people have called for implementation of a “precautionary approach” in food safety assessments (as well as in environmental risk assessments), which would place stricter demands on regulators. The precautionary approach would require that risk analyses be exhaustive; products being evaluated would be deemed “safe” only if it could be determined that there are no risks associated with the use or consumption of the product. Issues pertaining to the potential negative impacts of certified “safe” foods on certain groups (e.g., children or highly allergic individuals) also have been raised. In general, calls for stricter evaluations of certain chemicals and genetically engineered foods, more inspections of processing plants and grocery stores, and thorough product labeling all reflect the rights-based ethical demand that consumers be protected from exposure to (real and perceived) risks associated with foods.

ENVIRONMENTAL IMPACTS

Together with managed forests, crop agriculture and animal production dominate human-managed ecosystems on both a national and global scale. Along with that domination come the tremendous environmental impacts that agriculture has had and continues to have. These environmental impacts fall into three general areas of ethical concern. First, agricultural production practices can have toxic effects through organic wastes and chemical pollution, which can affect nontarget organisms, leave chemical residues on food, and expose farm workers and other human beings to harm. Second, agricultural use of soil, water, and genetic resources can be wasteful. Third, agriculture has a range of effects on wild organisms and natural ecosystems that goes beyond the direct effects of exposure to chemical toxins (CAST 1994). For example, do transgenic crops have unwanted environmental impacts (UNFAO 2001)?

Although most people would agree that these questions raise ethical concerns, difficult philosophical issues arise in attempting to articulate a response. Questions of acceptable risk, and norms for weighing the degree and distribution of risks against benefits, are central in each issue. As is the case with food safety, tensions arise between utilitarian- and rights-oriented approaches to risk. In addition, wasteful practices and effects on wild areas might be understood as ethically significant by virtue of their effects on the rights or welfare of future generations. Alternatively, some people believe that humans have obligations of stewardship and respect for nature that go beyond any use human beings will ever make of natural resources (Taylor 1981). Debates over the environmental impact of transgenic crops have raised anew the question of just what *is* an unwanted environmental impact (UNFAO 2001). Whether transgenic crops might provide environmental benefits over traditional cultivars also is relevant here.

INTERNATIONAL TRADE

There long have been questions about the fairness of the conditions of international trade, especially between richer and poorer nations. Most current ethical questions focus on the institutional arrangement under which global trade now is conducted—the World Trade Organization (WTO). Membership in the WTO implies that a nation agrees to abide by WTO rules concerning labor and production practices, environmental regulations, upholding of patent protections, and the adjudication of trade disputes. Although there are ways nations can challenge each other concerning breaches of these rules, certain nations may continue to ignore or violate WTO rules to their own advantage in clear violation of an agreement (Stewart and Dwyer 2001).

The WTO negotiations, rules, and sanctions clearly have ethical overtones. The existence of the WTO itself also has been subject to challenges: certain lesser-developed countries (LDCs) see the organization as a tool for North American and European corporations to gain/maintain control over their internal political and economic arrangements. This control includes forcing LDCs to submit to the practice of outsiders holding patents on, for example, crop species indigenous to a particular LDC. Ethical concerns include potential foreign monopolistic controls over natural resources, markets for products, or commodities produced in LDCs—all violations of the citizens’ rights.

There also is the issue of possible inequitable distribution of the benefits of an LDC’s participation in the WTO and global trade. Another issue is potential violations of national sovereignty (Anderson 2000). Certain nations may wish to prohibit imports of a commodity in order to support their internal industry (e.g., Northern European nations rejecting lower-priced U.S. imports to keep their own dairy sectors healthy). The WTO can override these actions by labeling them *nontariff trade barriers*, in effect forcing imports. Most long-standing and current ethical issues concerning international trade stem from differences in economic power among member nations and their major corporate traders, the ethical implications of which stem from concerns about both rights and the distribution of benefits and harms (Hoekman and Martin 2001).

FOOD SECURITY

Food security is an umbrella term that covers a wide variety of issues. At its most basic level, food security notes that having enough food is a basic need for all human beings, and that threats to the food that people need to survive are among the most basic problems human beings have faced since antiquity. The phenomenon of hunger continues to be an important topic for agricultural ethics, as well. For example, what moral obligations do people who are relatively well-off have to those who are

less well-off? The philosopher Peter Singer has argued that a simple moral principle—namely, if one can avert a significant harm to others at very low harm to oneself, then one is obligated to do so—implies that everyone should contribute far more to hunger relief than they typically do (Singer 1972). Similarly, the International Declaration of Human Rights (UN 1948) stresses that food is a basic human right and that meeting this right by securing food for all is a fundamental moral and political responsibility.

The basic moral obligation to ensure that the hungry are fed leads one to more technically difficult issues concerning agricultural development. Certain schemes for increasing food production in chronically poor parts of the world have failed to relieve hunger for those who live there. Some people argue that the root cause of hunger in such circumstances is unconstrained population growth, whereas others argue that the disenfranchisement of poor farmers through schemes to intensify production is the more frequent cause of hunger.

Worldwide, the race to increase global food production often has served as a rationale to deploy new methods of agricultural production. Critics argue, however, that the world never has lacked enough food, but rather, the moral will to distribute it equitably. On all these issues, classic philosophical approaches to ethics—utilitarianism vs. rights, for example—merge with complex issues in economics, politics, and development theory. The comprehensive worldviews that divide people on questions of population and development are based only in part on cultural and religious norms, but ethical norms often play a key role in those worldviews as well.

Recently, food security has become associated with bioterrorism. This association, too, is a topic with ethical dimensions, inasmuch as determining the characteristics that distinguish terrorism from criminal or even legitimate state activity is a matter of values and ethical judgments. Furthermore, the trade-offs that must be made to minimize threats from bioterrorism bring all other subjects of ethical concern—from farm structure and environmental impacts to food safety and animal ethics—into the evaluation of how one should respond to a threat.

AGRICULTURAL BIOTECHNOLOGY

The development of recombinant DNA techniques for transforming agricultural plants and animals, as well as for food processing and animal drugs, has been the focus of controversy for more than 20 years. The debate reached one peak in the United States in connection with the approval process for bovine somatotropin within the dairy industry, only to resurface again in connection with European and Japanese consumer rejection of transgenic maize and soy. The highly visible political controversy over biotechnology has made the debate a prominent place for the consideration of virtually every ethical con-

cern discussed in this paper. Agricultural biotechnology is debated in terms of food safety and consumer consent, the broader environmental effects of its use in crop and livestock production, its impact on the structure of agriculture, and its potential to address problems of hunger on a global basis (Thompson 1997).

Each of these issues might be raised with respect to many technologies that affect yields or production practices in the food system. It is accurate to say that many of the real issues have little to do with the use of transgenic technology. Yet such a statement also is misleading because of the way that biotechnology has come to symbolize the broad pattern of technological change within the food system for the broader public. The controversy over biotechnology thus is ethically significant because it signals a current of dissatisfaction within a subset of the public regarding general social and technological trends in the food system, and because it illustrates the frustration that segment of the population feels over its inability to influence policy and practice within the food system. Here, biotechnology also connects with the general issue of consumer trust in science.

Beyond these issues of power over the food system and consumer confidence in the judgment of experts and powerful actors (participants in the process), there are several issues unique to the use of biotechnology. One issue concerns the quasi-religious question of whether these technologies are so intrusive with respect to life processes that they amount to a form of disrespect for humanity's proper relationship to nature, a form of "playing God" (Comstock 2000b). Here, agricultural biotechnology is viewed as but one component of a revolution in biology that includes the possibilities of human cloning and genetic engineering. An outgrowth of this concern can take the form of whether people have the right to base their dietary choices on religious and quasi-religious beliefs. If a person believes that so-called biotech foods are impure on religious or philosophical rather than scientific grounds, is it ethical for the food industry to place that person in a position in which it becomes impossible to make dietary choices on the basis of these beliefs?

RESEARCH ETHICS

The debate over agricultural biotechnology has occurred at the same time that U.S. research agencies such as the National Institutes of Health and the National Science Foundation have urged greater attention to research ethics. Within many domains of science, research ethics has focused primarily on human subjects and informed consent, and secondarily on the use of animals as research subjects. Whereas the first concern has not affected agricultural researchers, the second one has, through the growing importance of Institutional Animal Care and Use Committees (IACUCs). The ethical issues dealt with by

the IACUCs relate closely to the ethical debate over animal welfare and animal rights.

Research ethics is coming to be seen in terms of the broader steering of and control over the research agenda and the proper role of self-interested actors (such as corporations) in supporting public-sector scientific research. In agricultural research, these ethical issues concern the appropriate way that food consumers, citizens, and other food system outsiders should have their values reflected in the development of agricultural production practices, especially as these practices are affected by new technology. One view holds that markets provide adequate opportunity for citizens to “vote with their pocketbooks,” whereas another holds that the power of actors such as farm organizations, suppliers, food companies, and government regulatory agencies limits the extent to which market choices truly can reflect the values of the broader public. The issues also can be articulated in terms of the public’s confidence and trust of these actors. If self-seeking economic actors can conspire in ways that limit which foods are available and at what price, why should the public accept the claim that biotechnology (or, indeed, any technology) serves the public’s interest in a safe, secure, and environmentally sound food system (Burkhardt 2002)?

TRUST IN SCIENCE⁴

Agricultural science is a communal process devoted to the discovery of knowledge and to open and honest communication of knowledge. Its success, therefore, rests on two different kinds of values.

Epistemological values are values by which scientists determine which knowledge claims are better than others. The values include clarity, objectivity, capacity to explain a range of observations, and ability to generate accurate predictions. Claims that are internally inconsistent are jettisoned in favor of claims that are consistent and fit with established theories. (At times, anomalous claims turn out to be justifiable and an established theory is overthrown, but these occasions are rare in the history of science.) Epistemological values in science also include fecundity, or the ability to generate useful new hypotheses; simplicity, or the ability to explain observations with the fewest number of additional assumptions or qualifications; and elegance, or scientific precision.

Personal values, including honesty and responsibility, are a second kind of values—those that allow scientists to trust the knowledge claims of their peers. If scientists are dishonest, untruthful, fraudulent, or excessively self-interested, the free flow of accurate in-

formation essential to science will be thwarted. If a scientist plagiarizes the work of others or uses fabricated data, that scientist's work will become shrouded in suspicion and otherwise reliable data will not be trusted. If scientists exploit those who work under them or discriminate because of gender, race, class, or age, then the mechanisms of trust and collegiality that underlie science, and provide science with its a priori ethical justifiability, will be eroded.

The very institution of scientific discovery is supported—indeed permeated—with values. Scientists have a variety of goals and functions in society, so it should be no surprise that they face different challenges. University scientists must be scrupulous in giving credit for their research to all who deserve credit; careful not to divulge proprietary information; and painstaking in maintaining objectivity, especially when funded by industry. Industry scientists also must maintain the highest standards of scientific objectivity, a particular challenge because their work may not be subject to peer-review procedures as strict as those faced by their university colleagues. Industry scientists also must be willing to defend research results that are not favorable to their employer's interests. Scientists employed by nongovernmental organizations face challenges as well. Their objectivity must be maintained in the face of an organization's explicit advocacy even though their research might seriously undermine the organization's fund-raising attempts.

All scientists face the challenges of communicating complex issues through media channels that often are not equipped to communicate the qualifications and uncertainties attached to much scientific information. At its core, agricultural science is an expression of some of our most cherished values. The public largely trusts scientists, and scientists must in turn act as good stewards of this trust.

CONCLUSION: INSTITUTIONALIZING AGRICULTURAL ETHICS

Ethical concerns have always been important in agriculture. It is fair to say, however, that ethics has not always been given an explicit place in the structure of organizations dedicated to agricultural leadership, decision making, education, and research. There are exceptions: the USDA's various advisory committees on agricultural biotechnology have, over the years, included at least one member educated in agricultural ethics. Professional associations such as the American Agricultural Economics Association, the American Society of Animal Science, the Poultry Science Association, the American Dairy Science Association, and the American Dietetic Association (among others) have included sessions on ethics in their annual meetings. Some associations even

⁴This section is based on Comstock 2001, “Ethics and Genetically Modified Foods,” and is used with permission of the publisher.

have a “Code of Ethics.” But only rarely have farmer organizations, food industries, agricultural universities, and government created specific departments or dedicated positions to ensure that ethical issues receive discussion and review.

In one part, this decision reflects a view that ethics is every person’s responsibility. In another part, the decision to omit ethics reflects a once-dominant, but now largely discredited view that values and value judgments are inimical, or contrary, to the practice of science. As agriculture became more thoroughly influenced by science and scientific research, this view may have led administrators to neglect developing ethics programs, especially within agricultural research and education. It is thus appropriate to consider how ethics might be institutionalized more effectively than it is today.

The most direct strategy for institutionalizing ethics is for everyone in the food system to begin to include some consideration of ethics in the actions, decisions, and policies they create or support. This strategy means that farmers, scientists, research administrators, regulators, and decision makers at the highest levels routinely would reflect on the ethical rightness or wrongness of their own actions and decisions, as well as those of others; engage in debate as appropriate; and, ultimately, try to act ethically. As already noted in this paper, this kind of reflection occasionally has been done; to institutionalize agricultural ethics, however, it has to become a priority. Unfortunately, other pressures such as politics, economics, and expediency frequently get in the way of ethical reflection. Inertia also is a factor. Ethical discussion and review have not been included in routines for so long that to attempt to do so now would require a significant paradigm shift in people’s lives, practices, and institutions. This is why the process of institutionalizing ethics should be focused on the main institutions that provide the human, technological, and informational input into the food system: agricultural universities.

Within agricultural universities, there is a clear opportunity to develop research and teaching on ethical issues. There is a need to develop this capacity if ethics is going to be carried into the larger social arena, and some land-grant universities already have done so. But if ethical analysis is at all useful in identifying goals and strategies for agricultural policy, science, and technology, then more—rather than less—ethical analysis should be conducted. This identification means that ethical research should be accepted as part of the portfolio for researchers in virtually every agricultural discipline. Perhaps a necessary first step would be a core group of specialists who debate and publish on ethical values and goals that affect decisions in the food system. This core group should include not only ethicists and policy analysts, but people trained in the agricultural scientific disciplines as well. The long-term goal would be to bring consideration

of ethics to every faculty member in every department in every discipline.

Clearly, for research on ethical issues to have any influence on agricultural practice, it is necessary to have teaching programs that address ethical issues in multiple ways. At the very least, it is essential to have components of existing courses in the agricultural sciences that signal the importance of value judgments with respect to the issues being covered. The course material could be tailored to topics relevant to particular agricultural majors (e.g., animal ethics for animal science classes, farm structure issues for agricultural engineering classes, food safety for food science and nutrition classes, and so on). Better still, in addition to these course modules, there should be stand-alone courses that teach undergraduates about the major ethical traditions and their relevance to practices in the food system. These courses may be the “survey” type, which cover a range of issues such as those discussed in this paper, or the “theme” type such as “ethics and agricultural technology” or “agricultural ethics in a global economy.”

Another approach to institutionalizing agricultural ethics at universities would be to provide graduate-level courses. These offerings may be more discipline-specific and may provide more in-depth training on how to address ethical values; for example, why and how to characterize and measure environmental risks (for the soil and water sciences), how to assess animal welfare and behavior and why it is an issue (for the animal sciences), and the whys and hows of conserving natural resources (for forestry).

Yet another dimension of teaching agricultural ethics is extension or outreach. It is clear that everyone in the food system is facing ethical issues in her or his daily life. Agricultural scientists and ethicists can help people sort through management, conservation, or technology issues as well as ethical conflicts or dilemmas. Although it is not the responsibility of extension professionals to provide unequivocal answers to ethical questions, it is their responsibility to provide the best expertise possible to help their clientele.

Indeed, within the private sector it will become increasingly important for agricultural companies and farm organizations to consider ethical issues. Extension can assist these efforts through providing reports and issue papers, short courses, and conference presentations that promote broader awareness of ethical issues. Government agencies also should be seen as potential clients or targets for ethical position papers and seminars on agricultural ethics. Perhaps, with increased awareness of ethical issues and concerns, agencies would provide greater support to research on the ethical, philosophical, and value-based problems affecting agriculture.

Responses to specific ethical problems, such as the public’s trust in agricultural science, may require indi-

vidual and institutional responses that go beyond the measures described in this document. These responses may include providing opportunities for broader public participation in decisions, or more effective outreach programs to elicit a wide range of citizens' perspectives. Ethics alone will not indicate what is needed; the problem will determine the most appropriate response. The emphasis here is on the need for agricultural institutions to develop a base of expertise in signaling the nature and importance of ethical concerns, with the expectation that developing this base will lead to more effective decision making in the future.

Ultimately, though, the issue of institutionalizing ethics in the food system comes down to the responsibility of each of us involved in this system to accept the fact that if ethical issues are going to be understood, and if ethical conflicts are going to be resolved, it is our responsibility, within the limits of our place in the system, to understand and contribute. The word "ethics," after all, means "way of life."

APPENDIX: GLOSSARY⁵

To add to this examination of ethical theories and their application to some of the most important issues facing agriculture and the food system, a brief glossary of "technical" terms sometimes used in ethical discussion and analysis is included. As discussed in the paper, ethics is not science, and there is some room for differences in the interpretation of terms included here. Nevertheless, among ethicists, there is general agreement on the importance of the following terms and ideas.

Animal rights. The term is used to refer both specifically to the view that individual animals have interests that should not be subjected to cost-benefit style trade-offs and to the social movement calling for radical change in human use of animals, without regard to the philosophical basis for taking animal interests into ethical consideration. Philosopher Bernard Rollin has argued that animals have a moral right to humane treatment that cannot be sacrificed for the pursuit of economic production goals. Philosopher Tom Regan has argued that vertebrate animals have more extensive rights that make it improper to use them in any way that requires their death. Regan, as well as utilitarian Peter Singer, has been associated closely with the animal rights movement. *See also Moral rights.*

Animal welfare. The idea that the pain and suffering of animals is ethically relevant in decisions about how people interact with them. Philosophers (most no-

tably Peter Singer) who argue for the welfare of animals do so from a utilitarian framework: because both humans and animals experience pain, our moral obligation is to decrease the pain of animals (as well as humans) if there is no overriding benefit to humans or animals. *See also Utilitarianism.*

Consciousness. The ability to have a reflective awareness that one has experiences, sensations, and interests. *See also Sentience.*

Descriptive. Descriptive statements tell what is the case: what is proved to be true, or has been observed. *Compare Prescriptive.*

Fairness. A term associated with justice, and given prominence by John Rawls's *A Theory of Justice* (1971), in which he argues that the rules or principles of justice are based on what people would agree to in a fair bargaining situation.

Good[s]. What people value, or what counts as a benefit to them. Some people see good as physical pleasure; for others, good is the satisfaction of higher-level desires. Often, expressed preferences are thought to be indicators of what people actually value.

Instrumental value. A thing is valuable because of its usefulness, function, or ability to provide us with benefits. *Contrast Intrinsic value.*

Intrinsic value. A thing is valuable for its own sake and not for its usefulness or benefit-conferring ability. For instance, people cannot be disposed of simply because they no longer are useful or functional. Judgments of intrinsic value call for actions expressing moral respect. *Contrast Instrumental value.*

Justification. Giving good reasons to support an ethical decision or argument. Justification within ethics is given by appeal to ethical theories or principles, which are themselves justified by appeal to a more encompassing foundational rule or obligation.

Legal rights. Rights that individuals have based on statutes, constitutions, or legal precedent; civil rights often are written in such documents. Legal rights are distinct from and do not necessarily equate to moral rights. *See also Moral rights.*

Moral agent. A being that is rational and capable of understanding and responding to the demands of morality. Maturity and rationality are required because such beings must be capable of a full understanding of the stake they have in any decision; i.e., they must be aware of how their own self-interest and that of others may be affected or compromised by their decisions.

Moral considerability. Having the characteristics sufficient to be a member of the moral community. Membership in the moral community means a being is entitled to some consideration in ethical decision making. Some people include nonhuman animals, fetuses, future generations, habitats, plants, natural objects, and other beings in the moral community.

⁵This section is based, in part, on Hartel, George, and Vorst 1994, *Agricultural Ethics: Issues for the 21st Century*, and is used with permission of the publisher.

Moral rights. Rights that individuals have independent of what is written in law or custom. Rights have been described variously: as protections for the individual against mob rule; trumps against the common good; constraints on the efforts of society and those in power to maximize the good for all at the expense of a few; or valid claims to the satisfaction of an interest where an interest is something that is truly good for a person, regardless of whether the person knows it or wants it. *See also* **Animal rights, Legal rights.**

Norm [Normative]. A rule or standard that determines goodness or badness, rightness or wrongness. Rules that prescribe/proscribe certain decisions and actions.

Prescriptive. Prescriptive statements tell what we *ought* to do or what *ought* to be the case, whereas descriptive statements tell what is the case. Prescriptive statements also may come in the form of commands, such as “Do not kill!” Attempting to deduce a command or a prescriptive claim from facts alone is a logical fallacy. *Compare* **Descriptive.**

Sentience. The ability to feel sensations of pleasure or pain. *See also* **Consciousness.**

Utilitarianism. An ethical theory directing agents to act to maximize the good (benefits) or minimize the harms (if positive good cannot be attained) for all who will be affected by the decision maker’s choice. The social good is determined by the net benefits (benefits minus harms) an action produces. In deciding on the social good, all consequences of one’s actions should be considered *See also* **Animal welfare.**

Virtue(s). Character traits, or dispositions to act, that are deemed constitutive of what it means to be a good person. A person is good if he or she has virtues and lacks vices. Typical virtues include courage, temperance, justice, prudence, fortitude, liberality and truthfulness.

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Council for Agricultural Science and Technology
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Ames, Iowa 50014-3447, USA
(515) 292-2125, Fax: (515) 292-4512
E-mail: cast@cast-science.org

