3

A framework for ethical analysis

OBJECTIVES

When you have read and discussed this chapter you should:

- understand how modern theories of utilitarianism, deontology and virtue ethics are reflected in the *common morality*
- understand the importance of Rawls' theory of justice to modern liberal democracies
- appreciate the theoretical basis of the framework called the *ethical matrix*
- understand how the ethical matrix can be applied to ethical reasoning in a specific example in the biosciences
- appreciate the range of ways the ethical matrix can be used and the nature of its limitations

3.1 Introduction

This chapter describes a framework for analysing bioethical issues and for facilitating, but ***not determining***, ethical decision-making. Such issues cover a very wide spectrum; and the people involved might range from an individual (such as a bioscience student) deciding, for example, whether to become a vegetarian or whether to apply for a job with a particular biotechnology company—to a government committee deciding whether to advise that a specific reproductive technology should be legalized. Typically, such questions take the form of dilemmas (problems that initially, at least, seem insoluble), which can sometimes be perplexing. Bioethical dilemmas are often characterized by one or more of the following features:

- good reasons are proposed both for supporting and for opposing a particular course of action
- the ethical acceptability of a course of action depends to a significant degree on scientific evidence, which may be complex and/or incomplete and/or debatable
- a decision has to be made by, and/or for, society as a whole, in which a significant number of people (sometimes the majority) may oppose the opinion held by most scientific experts.

We saw in chapter 1 that ethical issues are crucially important in the biosciences, in relation to the process of discovery as well as in the application of biological knowledge as

biotechnology. Chapter 2 considered the principal ethical theories that philosophers have proposed with the aim of systematizing, and hence facilitating, ethical decision-making. But we also saw that the complexity of the issues that ethics seeks to address seems to defeat all attempts to come up with a single, all-inclusive, but widely acceptable, theory. For example, both Kant's **categorical imperative** to 'tell the truth' under all circumstances, and Bentham's **hedonic calculus**, that appears to allow the violation of individual human rights in pursuit of net happiness for society, seem liable on occasion to result in acts of inhumanity and injustice. Even so, despite their limitations, modern versions of utilitarianism, deontology (Kantianism), and virtue theory do seem to identify important ethical concerns. So it is natural to ask whether a way forward in ethical analysis and decision-making might be found in combining elements of the different theories; or whether the differences between them are so large as to make any synthesis impossible.

3.1.1 The common morality

Three factors suggest that a synthesis is, at the very least, feasible. In the first place, the *outcome* of ethical reasoning based on the different theories is often quite similar, if not identical. For example, contributing to famine relief when you are able to do so is an ethical requirement of all three theoretical positions, while speaking honestly would be advocated by ethical reasoning based on deontology, virtue theory and most forms of rule-utilitarianism.

Second, the fact that the main ethical theories were formulated many years ago has both strong and weak implications. Their continued relevance suggests that they appeal to fundamental, and timeless, aspects of the human condition, in that they are concerned with what it means to be human. But it also suggests that they may need some revision in the context of the modern world, in which, for example: advances in genomics have transformed our scientific understanding of life; enormous advances in health and educational achievement have been made; and many people live in multicultural, pluralist societies. Indeed, chapter 2 described several ways in which the original theories have evolved over the years.

Third, it is possible to identify elements of all three theories in the norms of behaviour and ethical belief generally accepted by society, which together constitute the so-called **common morality**. This may be defined as the ethical code shared by members of society in the form of unreflective common sense and tradition. As the *lowest common denominator* of society's ethical norms, it might not seem to be a very promising basis for ethical analysis and decision-making—but we should avoid undue cynicism, and not judge the standards of society's morals by their portrayal in tabloid newspaper headlines. Most people do act (or, at least, believe they should) in accordance with ethical norms such as honesty, compassion and fairness—even though there are many temptations to act deceitfully, selfishly and greedily. So, although rarely described as such, these **ethical principles** are important factors in most people's behaviour. If, then, we were to begin our search for a synthesis of the major ethical theories at the level of the principles they give rise to, there is a chance that the different approaches will begin to converge.

To avoid misunderstanding, it must be stressed that although our reasoning usefully *begins* with the common morality, it doesn't end there. People in casual conversation frequently make ethical judgements—on issues such as the justification for going to war, whether some

footballers deserve their high incomes or whether a modern biotechnology should be banned. But such views rarely pass the rigorous tests required of a philosophically valid theory. We will consider below some of the factors that are necessary in an authentic bioethical analysis—conditions such as the need for factual accuracy, coherence and consistency.

3.2 Ethical principles

The use of a principled approach in bioethics (sometimes called **principlism**) was first developed by the medical ethicists Tom Beauchamp (pronounced *Be-cham*) and James Childress (pronounced *Chill-dress*)[1] in the USA, whose aim was to help doctors, nurses and other healthcare professionals facing ethical issues in treating their patients. Many complex ethical issues are raised by modern medicine, including, for example, those involving decisions about euthanasia, experimentation on human subjects, organ transplantation and issues of justice in allocating scarce resources. These concerns are dealt with in the specialized field of **medical ethics**, and generally do not feature in this book. But some medical biotechnologies (such as infertility treatment) have wider implications and form the basis of chapters 5 and 6. However, because the *principles* introduced in medical ethics have more general applicability, they are discussed further in this chapter.

The Oxford philosopher David Ross noted in 1930 that an effective way of dealing with the problem of conflicting principles was to recognize that Kant's categorical imperatives and Bentham's attempt to maximize happiness were too rigid. What were needed were *conditional* principles (he called them ***prima facie*** **principles**, meaning 'at first appearance'), which allow a stronger case to overrule a weaker one in a particular circumstance.[2] This compromise position does not favour either the utilitarian or the deontological case, but accepts that neither duties nor consequences can be ignored.

Beauchamp and Childress built on Ross' approach by proposing that decisions in medical ethics should be based on a process of deliberation that involves considering the impacts of proposed actions in the light of four *prima facie* principles. Thus, in treating patients a doctor is regarded as having ethical duties to, respectively:

- cause no harm (based on the fourth-century BC Greek 'Hippocratic Oath') **[non-maleficence]**
- effect a cure (or at least provide palliative treatment) **[beneficence]**
- respect patients' autonomy (not regarding them merely as 'cases') **[autonomy]**
- treat patients fairly (e.g. without sexual or racial discrimination) **[justice]**.

The first two principles, named in square brackets, are mainly utilitarian, and the last two mainly deontological.

It has been claimed that the principles '*are general guides that leave considerable room for judgement in specific cases and that provide substantive guidance for the development of more detailed rules and policies*'. According to medical ethicist Raanan Gillon, the principles provide a set of '*substantive moral premises upon which to base reasoning in health care ethics*' and offer '*a transcultural, transnational, transreligious, transphilosophical framework for ethical analysis*' by allowing differences of emphasis within a scheme of universal applicability.[3] These are perhaps crucial features of any ethical approach that seeks to be relevant to today's multicultural, pluralist societies.

An important feature of this approach is that abstract principles are **specified** in concrete terms, providing **action guides** to be applied in specific clinical circumstances. The specified principles also need to be balanced, which can entail one *prima facie* duty overriding another, or some duties being only partially discharged. Sometimes, the rule of **the double effect** is invoked, which states that '*a single act having two foreseen effects, one good and one harmful (such as death) is not always morally prohibited if the harmful effect is not intended.*'[4] For example, if, as seems likely, suicide rates are higher in countries with higher literacy rates, schoolteachers should not in consequence be considered guilty of driving people to take their own lives!

The combination of different principles appears to be a useful strategy in that it attempts to achieve a synthesis of perspectives. But there are different opinions on the most suitable principles to employ. For example, the Danish bioethicist Peter Kemp has proposed that biomedical issues might best be considered in relation to the principles of **autonomy**, **dignity**, **integrity** and **vulnerability**.[5]

3.3 The principle of justice

We have noted (3.2) that the fact that the theories underpinning much ethical reasoning are often ancient (even though they have sometimes been updated) might imply that their relevance is limited by modern developments, both scientifically and socially. So it is reasonable to ask whether any important modern theories significantly amend or complement the traditional theories. One recent theory that has received considerable attention, and seems particularly relevant here, is the **theory of justice** advanced by philosopher John Rawls.[6] The theory is a development of the notion of the social contract, an early form of which was proposed by Hobbes (1.9). But much more recently, the idea of the social contract has been important in the establishment of the modern democratic state. In this political system, certain constraints on personal liberty (such as taxes and speed limits), decided by our representatives in government, are implicitly agreed to by the electorate in the interests of maintaining a safe and orderly community where justice prevails.

The term *justice* is open to many interpretations, depending on whether it is seen as a matter of deserts (which might entail punishing criminals) or entitlements (which might involve providing free health care). The related term **distributive justice** refers to the fair, appropriate or equitable distribution of resources between members of society. But here again, the words can mean different things: for example, goods might be considered justly allocated according to criteria such as: need, effort, merit, equality, or by market forces or lottery.

3.3.1 Rawls' concept of 'justice as fairness'

Rawls' concept of **justice as fairness** is an egalitarian theory that he claimed would be acceptable to '*free and rational persons concerned to further their own interests*'.[7] His case rested on a reinterpretation of the social contract as a hypothetical one, made under conditions that would guarantee that the chosen principles of justice would be *fair*. So he suggested a set of rules that would guarantee this outcome. Arguing that it would be

BOX 3.1 RAWLS' TWO PRINCIPLES

- **Principle I: equal liberties for all**

This states that each person should have as much liberty as is consistent with other people having the same amount of liberty.

- **Principle II: the difference principle**

This would ensure fair equality of opportunity, while restricting social and economic inequalities to those that would benefit the *least advantaged* members of society.*

*The principle would, for example, accept that it might be fair to pay surgeons disproportionately high salaries (to encourage them to undergo the lengthy and demanding training involved) if people in general, including the least advantaged, benefited from their surgical skills.

wrong to decide what was fair if we already knew our positions in society and the talents we possessed, Rawls proposed that our personal characteristics (age, sex, race, intelligence, physical attributes, wealth etc.) should be screened out by placing us behind an imaginary **veil of ignorance**. With this hypothetical device in place (which he called the **original position**), the parties choosing the principles would do so impartially, uninfluenced by their own interests or prejudices. Putting it another way, when we try to work out what will be a fair way of operating in a liberal democracy (the political system most people reading this book will live in), we shall need to *forget who we are* and imagine the possibility that we might belong to a highly disadvantaged group. Rawls argued that in such circumstances it would be most rational for people to adopt two specific principles of justice (Box 3.1).

This account of Rawlsian justice has so far focused on the individual, but Rawls saw the principle as equally applicable to organizations. In what can be seen as a telling comparison with Popper's methodology of science (1.5.1), Rawls emphasized the point thus: '*Justice is the first virtue of social institutions as truth is of systems of thought. A theory, however elegant and economical, must be rejected or revised if it is untrue; likewise laws and institutions, no matter how efficient or well arranged, must be reformed or abolished if they are unjust.*'[8]

Rawls' more recent work, building on his theory of justice, considered the problems faced in modern democratic societies,[9] in which '*a plurality of incompatible and irreconcilable doctrines—religious, philosophical, and moral—coexist within the framework of democratic institutions*'.[10] Since these political and cultural factors impact on bioscience and biotechnology no less than other aspects of modern life, there is a good case for examining their relevance to our bioethical analyses.

3.3.2 The status of justice as an ethical principle

Rawls considered that his development of ideas on justice as fairness was in the Kantian tradition of deontological ethics, and this is how most other philosophers have interpreted his theories. But justice can also be considered to be an important aspect of

utilitarian theory. The point was made forcibly by no less a person than John Stuart Mill (Box 2.1). The argument rests on the claim that to experience injustice is to be harmed, so that it legitimately becomes part of the cost–benefit analysis that forms the basis of utilitarian reasoning. According to Mill, justice is: '*The highest abstract standard*' which '*is involved in the very meaning of Utility or the Greatest Happiness Principle*'. Moreover, '*the equal claim of everybody to happiness . . . involves an equal claim to the means of happiness*'.[11]

Accordingly, in the following discussion the principle of justice as fairness will be considered a hybrid principle which is pertinent to both deontological and utilitarian reasoning.

3.4 Ethical standing

Up to this point, the discussion has focused almost exclusively on ethical impacts on people, and, in the case of medical ethics, on people as patients. But it is clear that when considering new biotechnologies the people affected often fall into some fairly distinct categories (often called **stakeholder groups**), whose specific interests it would be sensible to consider separately in any ethical analysis. Moreover, many issues in the biosciences also concern non-humans—both animals and plants. This suggests that the approach described by Beauchamp and Childress needs to be modified to take account of the relevant interests of other living beings.

The term **ethical standing** refers to the claim that someone or something is a subject of ethical consideration in their/its *own right*, independently of usefulness as a means to some other end. So an important question arises in the biosciences as to which of all the entities that might be affected by any procedure or technology should be considered to possess ethical standing, and how this will affect the ways in which we act. Kant excluded animals as having ethical standing because they are incapable of rationality (2.6.4): any consideration he might give them would be aimed at the sensibilities of their owners or the effects that our treatment of them might have on other people. Similarly, Rawls excluded animals, because they are incapable of acting as rational agents in the social contract forming the basis of his ethical theory.

But it is clear that if we take the common morality as a guide, not only do many animals possess ethical standing, but so also does the biosphere, both in the global sense and, more specifically, as defined aspects of the natural environment such as the rainforests or the biodiversity of a region. A useful term here is the **biota**, defined as '*the plant and animal life of a region*', with the implied concern for any ecological implications of human activities. (Environmental ethicists often refer to the **biotic community**.[12]) Indeed, the claimed rights of animals and the perceived need to preserve the integrity of the environment have both now become important areas of applied ethics. It is worth noting that other phrases are also used in philosophical literature to indicate possession of ethical standing, such as **moral standing**, **ethical status** and being **ethically considerable**. For our purposes, they all amount to the same thing. Indeed, it facilitates consistency if we refer to all groups possessing ethical standing as **interest groups**, recognizing that this does not always imply that they are capable of conscious thought.

3.5 The ethical matrix

In analysing the ethical impacts of any procedures and technologies that arise in and from the biosciences, it is useful to establish a framework to assist us in our deliberations. There would seem to be two necessary ingredients of this framework—a set of relevant *prima facie* principles, and a list of the agents that have 'interests'. Appeal to principles reminds us of the overarching considerations that need to be taken into account. The list of agents with interests will depend on the nature of the issue to be analysed, but it will usually include: different human interest groups (such as consumers, patients or farmers); animals, where they are used in experimental, agricultural or biotechnological procedures; and the biota where the procedures have environmental impacts. Some people might want to include other interest groups. For example, if a proposed biotechnology involved fundamental effects on the genotypes or phenotypes of plants, for example by genetic modification, the crop might be regarded as a legitimate interest group; but others would draw the line at sentient (conscious) beings and probably attribute any such concerns to one or more of the other groups.

A practicable framework for ethical analysis is a compromise between competing requirements. It needs to: (a) be based in established ethical theory to give it authenticity; (b) be sufficiently comprehensive to capture the main ethical concerns; and (c) employ user-friendly language as far as possible. Such considerations have resulted in the formulation of a framework called the **ethical matrix**, which has been used in research and teaching programmes over a number of years.[13] In the ethical matrix, three principles are employed. These are 'respect for':

- well-being
- autonomy
- fairness

which are applied to the interests of the different groups relevant to the issue being analysed. The three principles were chosen to represent the major traditional ethical theories; that is respect for well-being represents the major utilitarian principle; respect for autonomy represents the major deontological principle; and respect for fairness is important to both the utilitarian and deontological traditions (3.3.2), but also, and importantly, it encompasses the fundamental tenet of modern social contract theory.

Inclusion of all three *prima facie* principles in the framework acknowledges the plurality of perspectives that sincere people bring to an ethical analysis, and provides a means of registering the importance of each principle in any particular context. (It should be noted that in this scheme *well-being* combines respect for beneficence and non-maleficence, which are given separate identity by Beauchamp and Childress.[14]) Virtue theory (2.7) is less easily characterized, but the special place of virtues in moral life does not mean they take precedence over obligation-based principles.[15] Those whose primary motive is to live a life of virtue still have to decide what to do in order to act virtuously, and it is here that a principled approach is often valuable.

The term *matrix* derives from the fact that arranging the three principles and the different interest groups in a table produces a regular grid, in the cells of which the principles

are specified in language appropriate to the group in question. Thus, respect for the well-being of animals is specified as **animal welfare**, while respect for consumer autonomy is specified as **consumer choice**, for example in making purchase decisions. The word 'matrix' also has another, biological, meaning, which has relevance here. It refers to 'a substance or environment' within which something else 'develops'—an apt metaphor to describe use of the ethical matrix in facilitating the development of a reasoned ethical analysis.

3.6 An example using the ethical matrix: the case of bovine somatotrophin

To illustrate the use of the ethical matrix, the following sections refer to a particular example—a biotechnology used in animal agriculture. This involves a hormone called **bovine somatotrophin** (bST), which when injected subcutaneously into dairy cattle stimulates their milk yield. The hormone, which is produced by recombinant DNA (rDNA) technology in *Escherichia coli*, was the first genetically modified (GM) product to be used in animal agriculture.

This example has been chosen for three reasons. In the first place, it considers the interests of four readily identifiable groups (farmers, consumers, farm animals and biota), all of which are usually accorded ethical standing. Second, it highlights the tension between arguments for opposing ideologies (such as between economic efficiency and animal welfare, and between consumer choice and public health) which characterizes much bioethical debate. Third, it represents a current, rather than prospective, political issue, because since 1994 bST has been used commercially in the USA and some other countries, but in the EU its use is banned. A more extensive analysis is provided elsewhere.[16]

We need first to consider some facts. By injecting cows with bST every two weeks, farmers can expect an average increase in yields of 12–15%; and, although slight changes in nutrient content can be produced, their overall concentrations in bulked milk are probably unaffected. However, because higher metabolic demands may lead to increased rates of illness, there is an increased risk that the welfare of injected cattle will be diminished. The treatment also leads to an increase in the milk concentration of insulin-like growth factor-I (IGF-I), which is a potent mitogen. If the increased milk concentration of IGF-I was physiologically significant and if it remained biologically active at the level of the gut mucosa (claims which are contested by some scientists), it might pose a public health threat to people consuming the milk or dairy products. Figure 3.1 identifies the different steps of the process—from bST manufacture to impacts on the milk consumer, and on the farm environment. It also raises some of the alleged benefits and concerns over bST use.

Table 3.1 shows how the use of an ethical matrix can help to summarize the ethical issues raised by this technology in a systematic way that is based on the principles that comprise the common morality. Box 3.2 describes in more detail the ways in which the different principles are specified for each of the four identified interest groups.

The first thing to appreciate is that the specifications in the cells (Table 3.1 and Box 3.2) set out criteria that would be met if the principles concerned were **respected** by a pro-

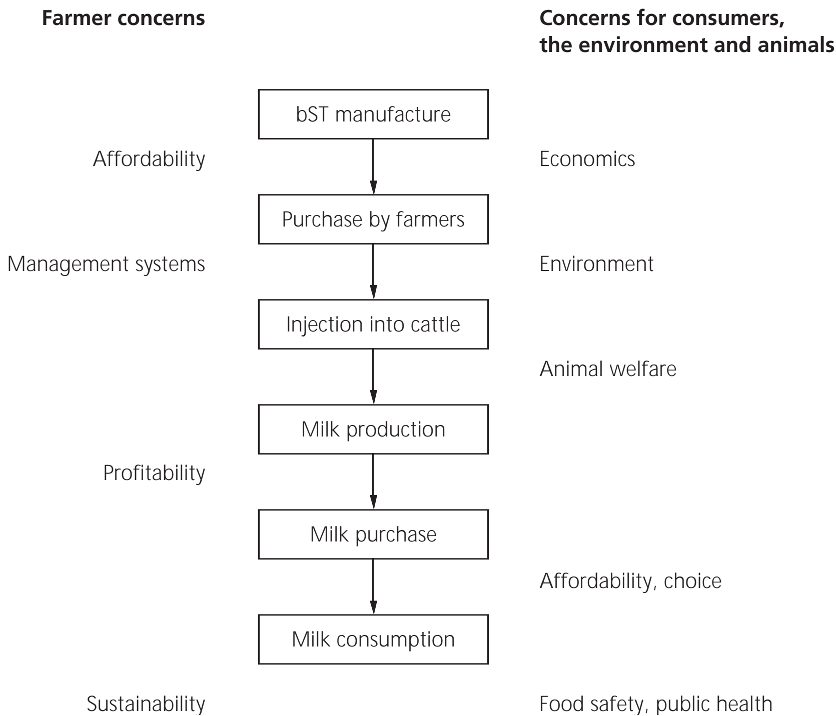

Figure 3.1 A flow diagram summarizing the use of bovine somatotrophin (bST) in dairying, illustrating potential concerns relating to dairy farmers, consumers, the treated animals and the environment. For details, see 3.6.

posed action. In one of the commonest ways in which the matrix is used, the impacts of the action, in this case injecting cows with bST to increase their milk yields, are compared with the conditions when bST is not used—so the *status quo* represents the baseline condition. Because some ethical impacts might be ***positive*** (e.g. an increase in the incomes of dairy farmers using bST, so respecting their well-being), they would be 'scored' positively (e.g. +1 on a scale of +2 to –2). On the other hand, some impacts might be negative (e.g. the cows' welfare would be **infringed** if the additional metabolic load led to more cases of lameness), so that they would be scored accordingly (e.g. –1); while some impacts might be insignificant (and so recorded as 0). A 'filled in' ethical matrix would thus show a total of 12 scores for the perceived ethical impacts of bST use on the three principles applied to the four interest groups. This assessment is referred to as an **ethical analysis**. It should be appreciated that numerical scoring means no more than use of the adjectives *very* (for '2') and *quite* (for '1')—and if people thought numbers gave the wrong impression, those or similar words could be used instead. But some means of grading responses seems necessary.

It is also important to emphasize that it is not possible from this analysis to directly deduce the ethical acceptability, or otherwise, of bST use, for two reasons. First, the different principles will have different degrees of significance for each assessor. This might be expressed by saying the different factors carry different **weights**. The next step in the

Table 3.1 The ethical matrix applied to use of bovine somatotrophin (bST) in dairy farming

Respect for:	Well-Being	Autonomy	Fairness
Dairy Farmers	Satisfactory income and working conditions	Managerial freedom of action	Fair trade laws and practices
Consumers	Food safety and acceptability. Quality of life	Democratic, informed choice, e.g. of food	Availability of affordable food
Dairy Cows	Animal welfare	Behavioural freedom	Intrinsic value
The Biota	Conservation	Biodiversity	Sustainability

Note: For details of the matrix see 3.5–3.6. For dairy farmers and consumers, both impacts and duties need to be considered, whereas for dairy cows and the biota (shaded) only impacts are involved.

process, **ethical evaluation**, involves subjectively weighing the different impacts, allowing one to reach an ethical judgement on the acceptability of bST use. The second reason why the analysis does not assess overall ethical acceptability is because it simply compares the impacts of two situations, neither of which might be ethically acceptable by comparison with some third option. In other words, a system adjudged marginally more ethically acceptable than another according to the analysis might still fall far short of a system which has not been investigated. For example, a case could be made for saying that a system of dairying that prioritized animal welfare, such as **organic farming**, would be a better baseline against which to compare bST use than conventional dairying systems, which already experience significant problems with animal diseases related to high productivity (7.6.4). And, of course, a vegan might consider all forms of dairy farming to be ethically unacceptable. What you get out of the matrix is totally dependent on what you put in. Many of the spec-ifications in Table 3.1 and Box 3.2 are self-explanatory, but additional comment will be helpful in some cases.

3.6.1 Respect and infringement of principles

In theory, for any proposed action, all the principles specified in the individual cells of the matrix might either be respected (earning a positive score for those wishing to quantify the effects) or infringed (deserving a negative score). But positive and negative scores do not necessarily balance each other, even for a single specification. Thus, the duty ‘not to harm’ (***non-maleficence*** in the terminology of Beauchamp and Childress) might be thought to be more compelling than the duty to ‘do good’ (***beneficence***). For example, in the case of bST use, the duty not to harm cattle is often considered much more important than the duty to improve their lot. In some cases, it might be thought

BOX 3.2 MORE DETAILED SPECIFICATION OF THE PRINCIPLES IN AN ETHICAL MATRIX FOR BOVINE SOMATOTROPHIN USE (SEE TABLE 3.1)

Dairy farmers

Well-being: satisfactory incomes and working conditions for farmers and farm-workers ('satisfactory' is obviously debatable, but it is a better word than 'adequate', which might imply 'just enough to meet bare necessities')

Autonomy: allowing farmers to use their skills and judgement in making managerial decisions, e.g. in choosing a farming system

Fairness: farmers and farm-workers receiving a fair price for their work and produce, and being treated fairly by trade laws and practices

Consumers

Well-being: protection from food poisoning (and harmful agents, e.g. residues of veterinary drugs); this also refers to the quality of life citizens enjoy as a consequence of a productive and profitable farming industry

Autonomy: a good choice of foods, which are appropriately labelled, together with adequate knowledge to make wise food choices; this principle also encompasses the citizen's democratic choice of how agriculture should be practised

Fairness: an adequate supply of affordable food for all, ensuring that no one goes hungry because of poverty

Dairy cows

Well-being: prevention of animal suffering; improving animal health; avoiding risks to animal welfare

Autonomy: ability to express normal patterns of instinctive behaviour, e.g. grazing and mating

Fairness: treated with respect for their intrinsic value as sentient beings rather than just as useful possessions (instrumentally)

The biota

Well-being: protection of wildlife from harm (e.g. by pollution), with remedial measures taken when harm has been caused

Autonomy: protection of biodiversity and preservation of threatened species (and rare breeds)

Fairness: ensuring sustainability of life-supporting systems (e.g. soil and water) by responsible use of non-renewable (e.g. fossil fuels) and renewable (e.g. wood) resources; cutting greenhouse gas emissions

preferable to maintain the distinction between the two,[17] but this has the practical disadvantage of complicating the matrix by doubling the number of columns. So it is important to bear in mind in using the matrix, as shown in Table 3.1, that just as different principles often carry different weights, so can positive and negative effects for a single principle.

3.6.2 Clarification of consumer autonomy

Autonomy in this context is about liberty—being able to choose the sort of food you eat and how it was produced. In many respects these are *citizens*' concerns and not just consumers' concerns, because you might have legitimate views on how a food is produced irrespective of whether you consume that particular food.

But the liberty of individuals, like most things, must have limits. In a shrinking world, how free should the 'haves' in rich countries be to appropriate the Earth's resources, pollute the environment, and exploit cheap labour overseas to the detriment of poorer people in both developed and developing countries? Whether or not the sense of injustice is considered a persuasive factor, it has been argued that the West's excessive concentration on liberty has led to 'a fear of freedom', which is resulting in a dangerous backlash. For example, philosopher Thomas Gauly suggests that this illiberalism is evident in the violent attacks of extremist groups on the capitalist ideology of the West (notably in New York on 11th September 2001 and in London on 7th July 2005), in racist reactions of the political right-wing in many Western countries, and in reactions against the welfare state by those who consider that traditional standards are threatened by a debased popular culture.[18] Decisions about consumer autonomy thus concern some important political issues, and are not confined to whether a food bears an informative label or not.

3.6.3 Clarification of animals' intrinsic value

The principle of fairness applied to farm animals (here, dairy cows) is specified as respect for intrinsic value, a term which needs further explanation. Some things (e.g. stethoscopes and taxis) are valuable because of their usefulness, and are said to have **instrumental value**. By contrast, **intrinsic (or inherent) value** is assigned where it is possessed irrespective of any usefulness; and most of us share the fundamental belief, stressed by Kant, that all people have intrinsic value. But most people sometimes (and others, often) *also* have instrumental value, so that possession of the two types of value is not mutually exclusive. For example, doctors, taxi drivers and refuse collectors all perform useful tasks, making them of instrumental value. This does not raise an ethical concern if they do their jobs by choice, work in safe and congenial conditions and receive a fair income.

Attributing intrinsic value to dairy cows makes the assumption that in addition to their instrumental value in providing milk and dairy products, cows are also 'subjects of a life' which we have a duty to respect (2.6.4).[19] That is, they have **ethical standing** (3.4). Given all we now know about the sentience, sensibilities and even 'personalities' of cows, it would be unfair to regard them *simply* as useful objects. Recent legislation gives official recognition to this concept. For example, the 1999 Treaty of Amsterdam requires that animal sentience and welfare are recognized in the implementation of EU legislation. Some governments have gone even further: for example, the Swiss Federal Constitution relating to the genetic modification of animals (and indeed, of plants and other organisms) has been amended to take into account 'the dignity and integrity of living beings' (*Würde der Kreature*).[20]

The idea that animals have *merely* instrumental value, as was commonly assumed until very recently, now seems totally discredited. Putting it starkly to emphasize the point, if someone destroyed one of their valuable books, we might, at worst, think him a fool—but

if he destroyed his healthy cat (even painlessly, by poisoning when it was asleep) we should think him depraved.

3.6.4 Conservation, biodiversity and sustainability of the biota

When the principles of well-being, autonomy and fairness are applied to the biota, a different way of assessing the impacts is adopted to that used when considering individual farm animals. The reasoning behind this is that ethical impacts on the biota are concerned with life in the wild and on the collective scale—as populations, species and breeds. Consequently, the principles need to be specified quite differently to be at all consistent with the common morality—for it is commonly recognized that Nature is not 'fair' because we cannot protect the interests of prey without at the same time endangering the lives of predators. This implies that what is important is not the well-being or freedom of individual animals or plants, but rather the viability and, ultimately, survival of a population or of a species. (Some people suggest that we should intervene on welfare grounds to protect wild animals from their natural predators, and others that wild populations should be controlled by chemical contraceptives. Such views might be considered naïve.)

The point has been expressed by saying that '*Our relationship with wild animals arises out of an environmental ethic, which . . . can only be 'eco-centric', that is, it must not assign value to natural beings themselves but rather to their diversity and to the ecological systems on which they depend.*'[21] This suggests that the appropriate specifications of the principles for the biota are conservation, biodiversity and sustainability—which are all prominent environmental concerns. The rationale for translating respect for autonomy as biodiversity is that it may be seen as permitting the natural ecological interplay of the biota. Sustainability represents fairness in an intergenerational sense, by respecting the biotic impetus for survival. Unavoidably, there is often overlap between the specified principles, but this seems less important than risking gaps in the issues that need consideration. Such designations might, of course, be regarded as highly imaginative or figurative; but again, the more important question would seem to be 'do they address the crucial ethical concerns?' The concept of sustainability, and its relationship to the other two biotic principles, is discussed further in chapter 12.

3.6.5 The content of the cells

The factors in each cell of the ethical matrix which are relevant to performing an ethical analysis of the impacts of bST are of two major types. In some cases **factual evidence** is required. For example, you would need to know what increases in milk yield were obtained when bST is injected, whether any effects on the chemical nature of the milk have implications for consumer health, and whether the welfare of the injected animals is affected. For people who see science as about 'facts' the answers to such questions might appear straightforward. But as noted in 1.4, the nature of these 'facts'—whether they were obtained reliably, and whether they are relevant to the question in hand—are all matters over which there is sometimes disagreement. Even the scientific theory considered by some to justify the particular data examined may be questioned, and if the source of the data is thought to be biased (e.g. if a commercial company was relied on to produce the

key data supporting their own product, or if the data were produced by a pressure group known to be ideologically opposed to the product) the evidence might be unreliable. Assessing evidence may thus entail examining different versions of the 'facts' where there is controversy.

In contrast to factual data, other cells of the matrix require a judgement that is not dependent on the quantifiable consequences of bST use but instead concerns **values**. For example, in the pursuit of economic objectives, is it right to treat animals instrumentally by chemically altering their metabolism, or is it right to take risks with human health when appropriate scientific evidence is unavailable? People may well differ in how they assign value to matters such as welfare and freedom, and while the exchange of opinions on such matters is often valuable, they are not amenable to objective measurement.

3.6.6 The ethical matrix as an ethical map

It is important to appreciate that the aim of the ethical matrix is to facilitate rational decision-making but not to determine any particular decision. Indeed, conscious of Popper's criticism of what he called 'the myth of the framework' (in which he interpreted the word framework to mean a shared ideology, such as a scientific Kuhnian paradigm, or a political philosophy such as Marxism),[22] to avoid confusion it might be preferable to regard the matrix more as a **map** than a framework. It is, after all, a pluralist tool, which seeks to identify society's whole ethical terrain. (Indeed, it would be instructive to use the matrix as a computerized relief map, to show the various peaks and ravines.) So, far from constraining ethical reasoning, the matrix provides a vehicle for the expression of the full range of ethical perspectives.

The proof of this claim is that both people approving of bST use and people opposing its use can use the ethical matrix to justify their differing opinions, as has been demonstrated in workshops conducted with experts.[23] This indicates two important points about the matrix:

- it provides a means of explaining and justifying different ethical positions
- it facilitates identification of the areas of agreement and disagreement.

3.6.7 Ethical evaluations of the use of bovine somatotrophin

Box 3.3 summarizes the lines of evidence (facts and values) that have been presented for the different cells of the ethical matrix. According to different interpretations of the importance to be attached to this evidence, the governments of the USA and the EU reached opposing decisions on the acceptability of licensing bST for commercial use. Although in neither case were the decisions expressed in terms of ethical acceptability, it is clear that each would be justified, if it was requested of their supporters, in ethical terms: hardly anybody admits to acting unethically. We can thus summarize the two positions, according to the ethical criteria that have been defined.

- The ethical acceptability of bST use for those who have licensed it (e.g. the USA) would probably cite the need to respect farmers' freedom to innovate; and the economic benefits to the manufacturers of bST, to the economies of countries producing it, to the

BOX 3.3 A BRIEF ANALYSIS OF BOVINE SOMATOTROPHIN USE IN DAIRYING WITH REFERENCE TO TABLE 3.1 AND BOX 3.2

Dairy farmers

Well-being: some farmers using bST have increased their profits but economic data suggest others use it at a loss

Autonomy: farmers in the USA have an opportunity to increase productivity, but some might feel economically obliged to use bST (exemplifying the so-called *technological treadmill*)

Fairness: farmers in the USA are given the option of using a productivity-boosting technology. Farmers not using bST can label milk accordingly, but only at their own expense

Consumers

Well-being: an EU report by public health experts suggested possible (but currently poorly defined) risks of consuming IGF-I (whose concentration increases in milk of treated cows); an FAO/WHO committee denied any significant health risk

Autonomy: in the USA most milk is unlabelled, denying consumers a choice on whether to purchase milk from treated cows

Fairness: there appears to be no clear evidence of an impact on milk prices

Dairy cows

Well-being: cattle suffer increased disease rates (such as mastitis, lameness, metabolic and digestive disorders), as noted on the product label, which lists 21 possible adverse side effects. The EU banned bST largely on animal welfare grounds, but the manufacturers claim the diseases are treatable by medication

Autonomy: behaviour may be adversely affected by lameness, by reduced grazing opportunities due to increased concentrate feeding and by decreased fertility

Fairness: some people claim that the excessively instrumental use of cows is an infringement of their intrinsic value. Others claim this technology accords with accepted social norms

The biota

As quantitative data are lacking, claims are largely speculative.

Claimed *positive* features of bST use are that reduced cow numbers (because fewer cows are needed to produce the required milk yield) will lead to less environmental pollution (e.g. fertilizer use for forage growth and reduced silage run-off) and lower greenhouse gas emissions (methane is exhaled by ruminant animals).

Claimed *negative* features of bST use are that mergers in the dairy industry (as non-user farmers leave the industry), resulting in fewer but much larger dairy farms, will increase point-source pollution (e.g. excessive fertilizer use, silage run-off) and jeopardize biodiversity and sustainability by reliance on fossil fuels for fertilizer production etc. and routine veterinary medication.

farmers using it, and, were prices to fall, to consumers of dairy products. Moreover, if its use led to reduced cow numbers it might result in marginally reduced emissions of methane. This case also rests on perceptions that the welfare of treated cows is not affected significantly (or that increased disease can be effectively treated) and that there are no risks to human safety, so that labelling is unnecessary. Job losses in the dairy industry would not be seen as an ethical issue, being merely a feature of market economies, in which competition guarantees efficient production.

- The ethical case of those who have banned bST use (e.g. the EU) would probably focus on respects in which it appears to infringe commonly accepted ethical principles. They would point to authoritative reports suggesting that bST use substantially increases the risk of pain and disease in dairy cows, and that it might present a risk to human safety through ingestion of increased IGF-I in milk. Moreover, they might consider that bST use would: reduce farmers' autonomy; undermine consumer choice if milk products from treated cattle were not labelled; jeopardize public health if rejection of dairy products followed the licensing of bST (because milk is a valuable source of dietary nutrients); and increase local pollution through the intensification of dairying.

3.6.8 Using the ethical matrix to facilitate personal and group decision-making

The above description provides a guide to identifying relevant issues in reaching a personal position on bioethical concerns. It might also suffice for using the matrix in group discussions or workshops; or as an introduction to the interactive web-based version of the matrix (see Useful Websites at the end of the chapter). But employing a suitable tool for ethical analysis does not guarantee a genuine ethical evaluation. If users adopt a partisan position on the issue, for example allowing bias to influence the choice of scientific data, then the tool is unlikely to prove of value.

A conceptual device to counter this tendency, is to try to *put yourself in the shoes* of each interest group in turn as the different cells specifying its interests are considered. This strategy corresponds to Rawls' veil of ignorance, behind which judgements are to be made in deciding on the just rules for society (3.3). In essence, it amounts to recognizing that ethics is concerned with caring about other beings with ethical standing that are described in the matrix. As Kemp puts it: '*ethics in its full scope aims at care of the other*',[24] and while only certain occupations are conventionally classed as 'caring professions', it is implicit in the remit of ethics that care should be exercised in relation to others (necessarily, but not exclusively, people). If someone was not prepared to admit to caring about anyone or anything other than him- or herself, it would be impossible for them to use the ethical matrix. But even if they expressed concerns for only *one* other cell of the matrix, say, *respect for farmers' profits* or, alternatively, *respect for animal welfare*, that revelation would starkly expose the value system determining their choices. In fact, experience shows that most people do ascribe some value to all cells of the ethical matrix, although the degree of value ascribed varies both with the individual and with the issue being discussed.

Of course, putting yourself in the shoes of others (developing '*an imaginative conception of others' predicaments*'[25]) is not easy, especially when the interest group concerned is non-human—although there is increasing scientific evidence, for example on the welfare of farmed animals, to add substance to our imaginative conceptions.[26] But genuine ethical insight is only likely to emerge from attempts to empathize in this way. In any event, empathizing with other people, for example farmers, or people on low incomes or in less developed countries (LDC), would seem to be within most people's imaginative capabilities.

The relative importance of the impacts recorded for each of the cells is ideally only revealed at the evaluation stage, when the separate impacts are weighed. This step is perhaps equivalent to removing Rawls' veil of ignorance, when a decision has to be arrived at by 'taking everything into consideration'. It is here that reflective equilibrium (2.4) becomes a significant factor, as one seeks the proper balance between the right and the good, and between intellect and intuition. In the words of philosopher Thomas Nagel, '*The capacity to view the world simultaneously from the point of view of one's relations to others, from the point of view of one's life extended through time,* [and] *from the point of view of everyone at once . . . is one of the marks of humanity.*'[27]

3.6.9 Use of the ethical matrix in public consultations and expert committees

The matrix has also been used in several other ways. For example, Matthias Kaiser and Ellen-Marie Forsberg have used it in public consultations about the future of the Norwegian fishing industry. Typically, such exercises are organized to include representatives of the major stakeholder groups, or—if the interest group is a non-human one—then those with particular expertise and/or commitment to their cause are present, such as animal welfare and environmental groups. Kaiser and Forsberg ascribe the value of the matrix to the following features. The matrix:

- is liberal regarding the approach to be adopted, enabling it to be read equally as a utilitarian or a deontological approach
- provides substance for ethical deliberation, guiding participants so that they do not stray into irrelevant paths
- translates abstract principles into concrete issues of direct concern to participants who may have little acquaintance with, or interest in, ethical theory *per se*
- facilitates extension of ethical concerns into fields benefiting from debate, such as democratic decision-making
- captures the basic fact that because different stakeholders will be affected differently by a decision their ethical evaluations may well differ. The object is not to downplay these differences but to search for an optimal solution in the light of the conflicts.[28]

Although it is conceivable that deliberation will result in attainment of consensus, the main value of the ethical matrix in this context may be that it provides the basis for broad discussion of ethical considerations. In such circumstances it may serve as a tool in what is called **discourse ethics**, as developed by philosopher Jürgen Habermas.[29] He

argues that the very diversity of views and values in the modern world requires that we continue to seek a universal justification of ethical norms, and these norms are valid if '***all those affected could agree to them as participants in a rational discourse***'. Discourse ethics thus reflects the ethical values attached to open discussion, which is an ideal of modern democratic societies.[30]

However, an important difference between the use of the ethical matrix in this and the more academic uses discussed in 3.6 is that many of the participants will have little knowledge of (and perhaps little interest in) ethical theory, although they are likely to be highly knowledgeable about the impacts of any proposed changes on their own circumstances, or those of the interest group they represent. So it is possible that the Rawlsian device by which we 'put ourselves in others' shoes' might be less important in such circumstances, where the nature of the whole group guarantees that the issues are viewed from different perspectives.

Apart from its roles in teaching and public participation exercises, the ethical matrix may serve as a useful structure for professional bodies and organizations concerned with formulating policy.[31,32] For example, the European Academy's investigation into the ethical and social issues associated with the development of functional foods employed the matrix to structure its deliberations;[33] the Food Ethics Council has used the framework in several of its reports;[34] and the UN FAO used a form of the matrix in its report discussing ethical issues in fisheries.[35] A manual describing the use of the ethical matrix as an **ethical tool** was produced as part of a project funded by the EU.[36] However, unfortunately, some people have misunderstood the aims of the matrix, assuming that it is intended to be prescriptive.[37]

3.7 A summary of aims and limitations of the ethical matrix

At its simplest, the matrix is merely a checklist of concerns, which happen to be based on ethical theory. But it can play a more important role by serving as a stimulus to ethical deliberation, and as the basis of ethical decision-making. It seeks to do this by establishing a coherent and consistent approach that gives due attention both to objective facts and to human values. It should be no more acceptable to 'fudge' an ethical valuation than it is to fabricate experimental data (15.3.1).

Above all, the aim of the ethical matrix is to encourage, in the phrase trumpeted by contemporary politicians, 'joined-up thinking'. The necessity to consider how narrowly focused interests interact with a wide range of other factors which are considered of value in society can only have beneficial effects. However, it is important to emphasize that:

- the matrix is not prescriptive: the fact that different people *weigh* the cells differently precludes its providing a definitive decision on ethical acceptability
- very few, if any, decisions that people might reach using the matrix could afford *equal* respect to all the ethical principles, so that some may need to be overridden by others, or respect for some only partially discharged

- the matrix is designed to *facilitate*, but not determine, ethical decision-making by making explicit the relevant ethical concerns and providing a reasoned justification for any decisions made
- contrary to the suspicion that the matrix necessarily complicates decision-making (with so many issues to consider), it might, depending on one's worldview, actually simplify matters, because when *all* the important factors are brought into the frame a single 'ethical' decision might suggest itself as inevitable.

Finally, it is important to state that the ethical matrix is primarily intended for use in addressing dilemmas raised by technical innovations. It is not a tool for addressing all ethical questions. Indeed, some issues that have important ethical dimensions are so straightforward as not to need any deep analysis. For example, if farm workers in LDC are paid unfairly low wages, if deceit is entailed in the marketing of a new product, or if an industrial company knowingly and wilfully pollutes the environment to cut costs—we are simply confronted with examples of injustice, dishonesty and irresponsible behaviour. It is as well to be aware that calls for an ethical analysis in such cases might be cynical moves, calculated to enable the perpetrators to buy time and mount a defence of their unethical practices.

3.7.1 Use of the ethical matrix in this book

Many of the chapters in this book, especially chapters 4–12, are implicitly underpinned by the theory encapsulated in the matrix. In some cases versions of the matrix are reproduced to structure the reader's thinking. But it has been considered unnecessary (and would perhaps be tedious) to make explicit reference in every case where it might be used. Even so, in deliberating on the various issues raised in the book, the conscientious reader might find that using this tool helps to structure rational thinking—even if ideas are only (proverbially) sketched out 'on the back of an envelope'.

THE MAIN POINTS

- A framework, the ethical matrix, is described, which is designed to help ethical decision-making by clarifying the principles involved, and illustrating how they can be applied to specific cases in the biosciences and biotechnology.
- Its use is exemplified with reference to an ethical analysis of bST, an agricultural biotechnology used commercially in some countries but banned in others.
- The ethical matrix seeks to facilitate a coherent, transparent, explicit process of ethical decision-making, which allows expression of the multiplicity of views that characterizes modern democratic societies.
- The ethical matrix has been used in teaching, research, public participation exercises and a web-based educational programme.
- The matrix can be a useful tool in aiding ethical decision-making but, like other such tools, it has several limitations.

EXERCISES

These can form the basis of essays or group discussions:

3.1 In view of differences between different nations, religions and cultures is it reasonable to speak of a *common morality* (3.1.1)?

3.2 Discuss different understandings of the term 'fair' (3.3). How should it best be interpreted in relation to: (*a*) your dealings with fellow students, (*b*) people living in other countries whom you do not know, and (*c*) sentient animals, such as pigs?

3.3 Do you think the ethical matrix as described (3.5) omits any important ethical concerns?

3.4 What are the *good* points, *weak* points and *interesting* points about the ethical matrix? (3.5) Can you suggest any improvements?

3.5 Try using the web version of the ethical matrix (3.5) listed below in 'useful websites'.

FURTHER READING

- ***Principles of Biomedical Ethics* (5th edition) by T L Beauchamp and J F Childress (2001). Oxford, Oxford University Press.** Useful background reading on ethical principles.
- ***Justice as Fairness: a restatement* by J Rawls (2001). Cambridge, Mass., Belknap Press.** This provides a development of John Rawls' seminal ideas, first presented in *A Theory of Justice* (1971), but it is not easy reading for non-philosophers.
- ***The Role of Food Ethics in Food Policy* by T Ben Mepham (2000). Proceedings of the Nutrition Society, *59*, 609–618.** A more extensive treatment of the case of bST in dairying using the ethical matrix.

USEFUL WEBSITES

- www.ethicalmatrix.net *Compassion in World Farming* (2003): an interactive web version of the ethical matrix (by Ben Mepham and Sandra Tomkins) which explores three types of animal farming. In each case, users assess organic systems against conventional, intensive forms of production. Because the exercise is primarily designed for use in secondary schools, note that the terminology used differs slightly from that employed in this chapter, e.g. respect for autonomy is represented as 'choice'.
- http://www.ethicaltools.info/content/ET2%20Manual%20EM%20(Binnenwerk%2045p).pdf A 'manual' designed to assist people using the matrix in committee settings (by Ben Mepham and colleagues, published in 2006).
- http://www.ethicsweb.ca/resources/decision-making/index.html A collection of useful articles on ethical decision-making can be found at *EthicsWeb.ca*.

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