Farm Animal Breeding & Society

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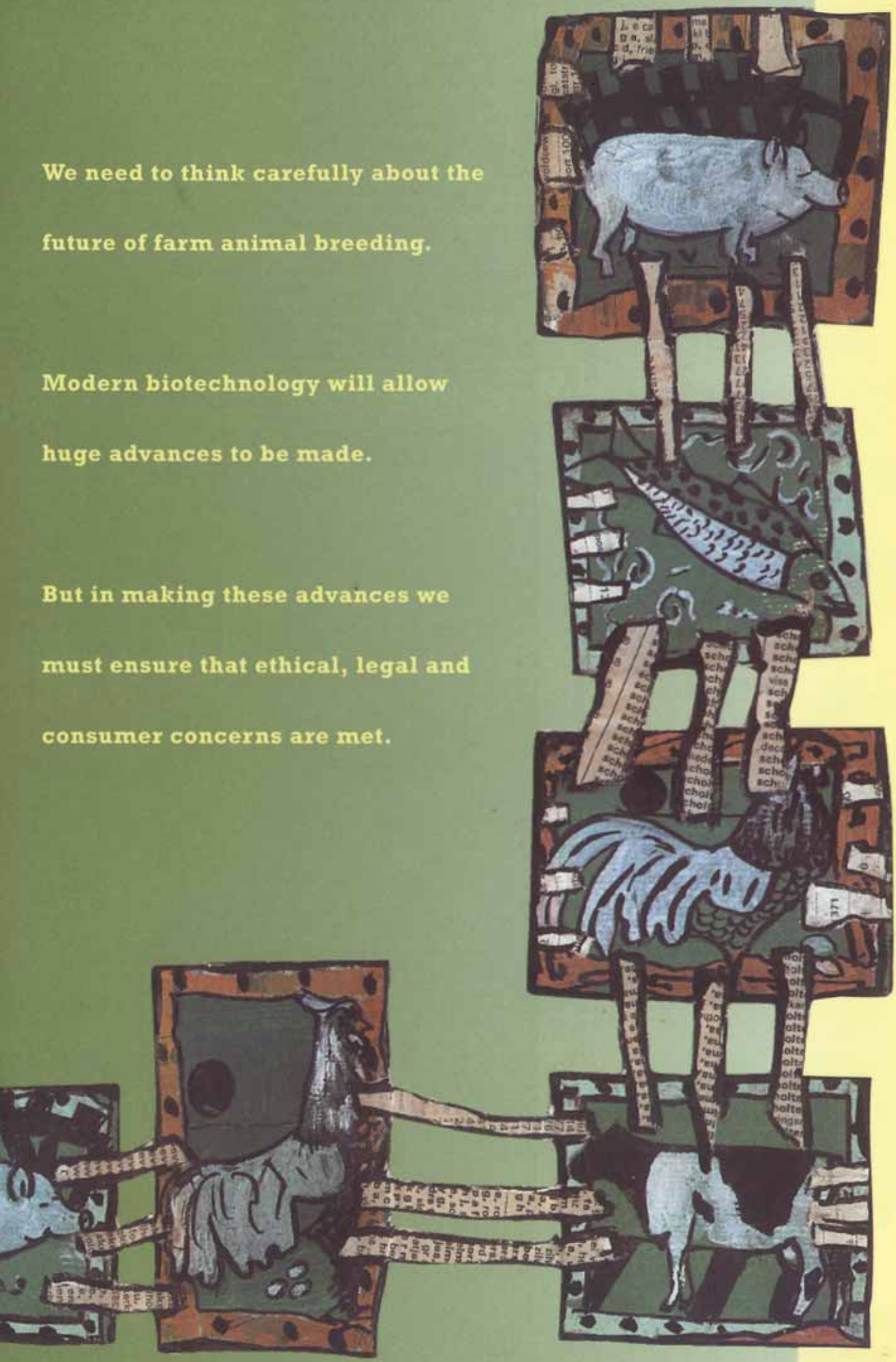
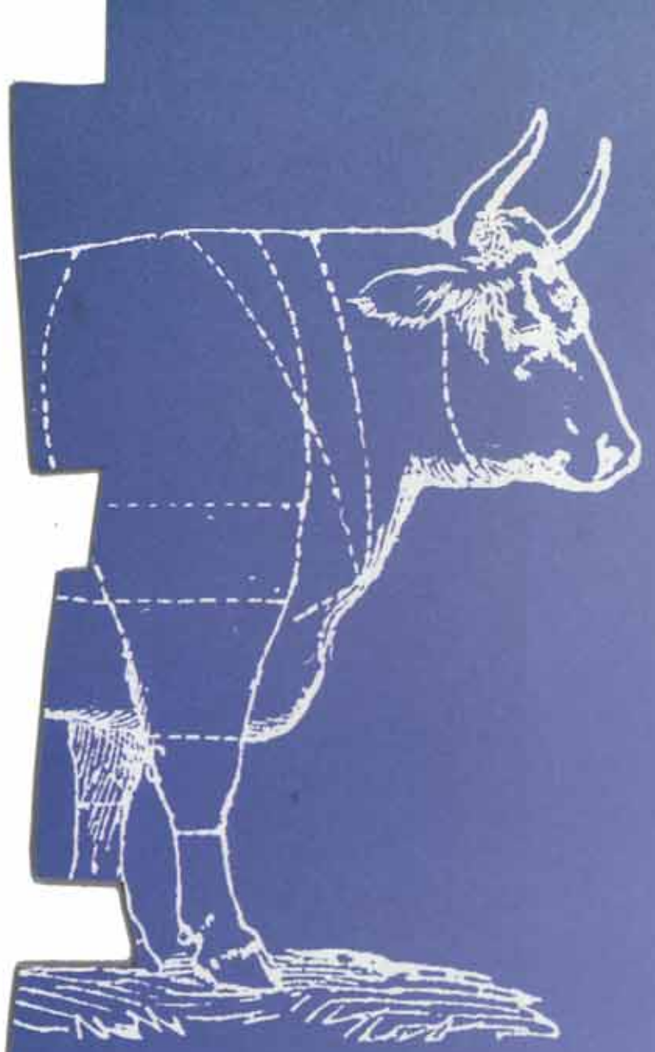
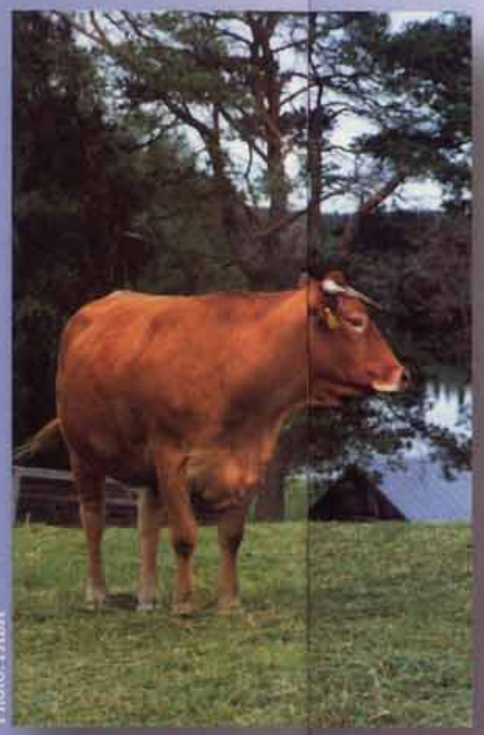
But in making these advances we must ensure that ethical, legal and consumer concerns are met.







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Breeding and Reproduction

The farm animal breeding sector provides farmers with improved varieties of livestock, such as cattle, pigs, poultry and fish. Both the goals and methods of breeding have until recently evolved gradually and uncontroversially. Today, however, they are developing rapidly, raising a range of arresting, but complex issues.

Take first the ever more sophisticated methods used by today's breeders. Cloning, often in the headlines following public interest in "Dolly", awaits technical development. But other reproductive technologies, such as artificial insemination and Multiple Ovulation and Embryo Transfer, are now established.

DNA technologies are also increasingly important. Marker-Assisted Selection enables desirable genetic traits to be identified precisely. Transgenesis involves moving genetically linked features from one species to another. Some experts hope that, through this process, "GM cows" will one day produce milk just like human breast milk, or that cattle will be bred for fertility and disease resistance.

The potential benefits here are undeniably exciting, but equally we need to ask where, exactly, we wish go with the new technologies. What are the real possibilities? What implications do these have? Will there be legal obstacles, or ethical objections, to some breeding methods and goals? What consumer concerns exist about food quality, price and safety, and how do these relate to attitudes to animal welfare?

The novelty and complexity of new techniques means that the consumer, retailer and even the farmer are increasingly distanced from the work of the scientists and animal breeders. Thus, if the issues are to be properly addressed, wider understanding of the breeding sector will need to be fostered.

In thinking about the future it is helpful to imagine three paths down which terrestrial farming practice might develop (fish farming is a special case).

The Conventional Path would largely involve continued use of the sort of medium-sized farms that are common in present-day Europe. On this path the development of new breeding biotechnologies would be just one, and not the primary, objective. The aim would be to offer high quality produce at reasonable cost.

The Alternative Path would involve moderate productivity and smaller farms. The focus would be on niche-market products, such as organic or regional foodstuffs, and on animal welfare. Any use of biotechnology would be limited accordingly. Farm produce would be relatively expensive.

Finally, the Low Cost Path would involve large farms which aim to produce cheap animal products efficiently. Biotechnologies assisting in this aim would be freely exploited.

Photo: HPB

Photo: BUT Ltd

Legal developments

Farm animal breeders operate under legal regulation. The law governing animal breeding took a significant step forward in June 1998 when the European Parliament adopted a directive harmonising patent law across the EU.

The Directive for the Legal Protection of Biotechnological Inventions gives the patentee the exclusive right to exploit an invention for 20 years. During this period the patent owner may grant use of the invention, but unauthorised use will attract compensation. Patenting therefore increases the economic incentive to do research and develop new technology. It encourages innovation.

Candidates for patenting must be new, not obvious and have industrial application. These criteria excluded many traditional animal breeding procedures, but the Directive makes it clear that modern techniques used in breeding and reproduction, and even certain kinds of animal and gene, can now be patented.

"Essentially technical" procedures involving processes which do not occur naturally will be patentable, including methods used to produce transgenic animals and to clone. Patents for animals developed for food or medical purposes may be issued following genetic modification, and genes shown to have a novel industrial use will be regarded as "inventions", not discoveries, and hence patentable.

A number of problems arising from these legal developments have been anticipated. Suppose, for example, that a patented genetic modification, preventing mastitis, is introduced into a particular breed of cow. Should the developer of that breed be rewarded, as well as the patent holder, when the breed is more widely sought?

Again, patents in this area are sometimes very broadly defined. It was feared that this would effectively create monopolies and inhibit research, but a "research exemption" within the Directive is designed to prevent this happening.

It has also been recognised that patented livestock which could not be farmed without repeated royalty costs would be uneconomic. Thus the Directive envisages that royalties will relate primarily to the acquisition and sale of breeding stock. Elsewhere – where, say, a dairy farmer breeds and then sells bull calves for beef slaughter – "farmer's privilege" will apply and no royalties will be payable.

Turning from commercial-scientific interests to animal interests, it is worth noting that the EU Directive introduces for the first time an ethical restriction on patents. Under the Directive, unless substantial benefits are at stake, patents should not be issued if that would be likely to cause animal suffering.

Patent law cannot, of course, regulate farm animal breeding where no patent is involved. This means that legal and quasi-legal licensing bodies have an important role to play in the breeding sector.

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fish	cattle	poultry	pig
poisson	bovins	volaille	porc
Fisch	Rinder	Geflügel	Schwein
vis	rundvee	kippen	varken
fisk	storfe	fjørfä	gris
fisk	nøtkreatur	fjäderfä	svin
fisk	kvög	fjerkræ	grise
kalarotuja	nauta	siipikarja	sika
ιχτυε	αιγοπροβατα	πουλεβατοι	χοιροι
peixes	bovino	galinhas	suíno
pescado	ganado bovino	aves	cerdo
pesce	bovini	volatili	suino

Photo: INRA

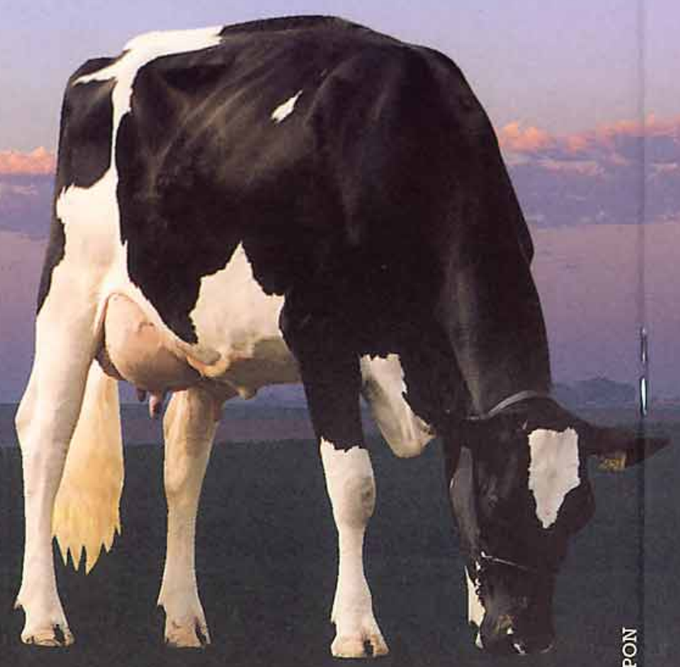

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Photo: HPB

Photo: MLC

Ethical Issues

It is generally accepted, particularly in Northern Europe and the US, that certain uses of biotechnology would be unethical. Ethicists do not always agree about which practices in animal breeding are objectionable and why. Almost all would acknowledge, however, that the animal's welfare is an important concern in breeding ethics.

In the animal breeding context welfare is best interpreted broadly to cover health and behavioural characteristics, as well as the minimisation of pain and suffering.

Modern breeding techniques can threaten animal welfare. In good part owing to selective breeding, today's broiler chickens grow twice as fast as they did 30 years ago, to a weight of 2 kg in about 40 days. The growth rate of their hearts and skeletons is now slow relative to weight-increase, however, and this causes cardiovascular and leg problems in some birds. Again, in a range of farm animals, reproductive techniques associated with embryo transfer and IVF have, at the early steps of implementation of those techniques, been found to be connected with serious stress, birth difficulties and congenital abnormalities. Recently improvements in OPU/IVF have been found to decrease these undesirable side effects of embryotechnologies. Research is focusing at further improvements.

Animal integrity is another important issue in breeding ethics.
The principal concern here is whether, in genetically modifying animals, we are violating the integrity of species. Last, but not least, potential losses of genetic diversity, risks to human health, and broader environmental concerns are also discussed in work on the ethics of breeding.

In every case, these debates focus on unintended harm which threatens to accompany the benefits at which breeding programmes aim. Accordingly, ethicists have tried to describe ways to weigh and compare such harms and benefits. Some give welfare a central role, and play down other factors. Others attach similar weight to welfare and other concerns.
Yet others see factors such as integrity as more important than welfare. The relationship of animal and human interests is central on any view, and debates here are both lively and continuing.

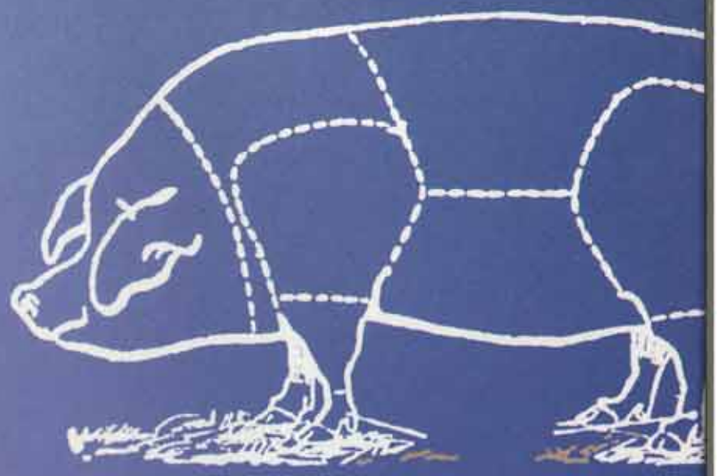

Photo: IPG

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The Consumer

The success of any breeding programme will ultimately be judged by the consumer. Where a breeder fails to deliver something you or I want, or need, the goals of the breeding programme must be reviewed.

Consumers enter the debate on animal breeding in two ways – both personally and through consumer organisations. Notoriously, people often express opinions they later abandon in the supermarket, so consumer opinion and consumer behaviour must be separated.

Consumer attitudes to modern breeding goals and technologies are continually developing. This is important. It means that scientists, governments and industry representatives have a real opportunity to build and shape public opinion about animal breeding, as well as responding to it.

If recent events involving crops are typical, genetic modification is likely to be the issue which arouses serious consumer interest in the animal breeding industry. And from the experience with crops, the animal breeding industry could learn a good deal.

It is thought, for example, that plant breeders inflamed hostility to GM crops by marketing modified soya beans without consultation or labelling and refusing, at first, to participate openly in public debate. Whatever their views, consumers like to be consulted, prefer to exercise choice, and expect to receive honest answers to reasonable questions!

Consumer opinion tends, unsurprisingly, to be more positive where medical products of biotechnology are at issue. A human health benefit can push worries about matters such as price and animal welfare down the list of priorities.

On food products, consumer preference reflects a range of concerns. Health-value, convenience, variety and price all affect purchasing behaviour, as do animal welfare and broader environmental factors. Food safety is a growing concern.

Perhaps because of this complexity, a number of surveys have found that most people are undecided about recent applications of biotechnology. In these surveys, only a minority of respondents express a wholly positive, or wholly negative, attitude toward the technology.

This suggests that public information campaigns, and media coverage of emerging issues and sensational incidents, might well exert considerable influence over popular opinion.

While the public are often undecided about specific issues, they do have views on who should be entrusted with decisions about biotechnology. A recent poll reveals that scientists, the media and commercial companies are seen to have too much influence. People place more trust in governments, public consultation and non-government organisations.

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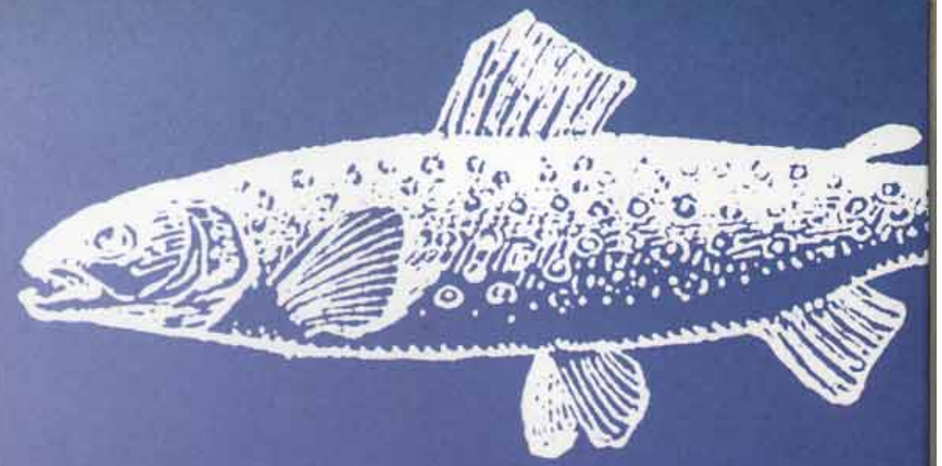

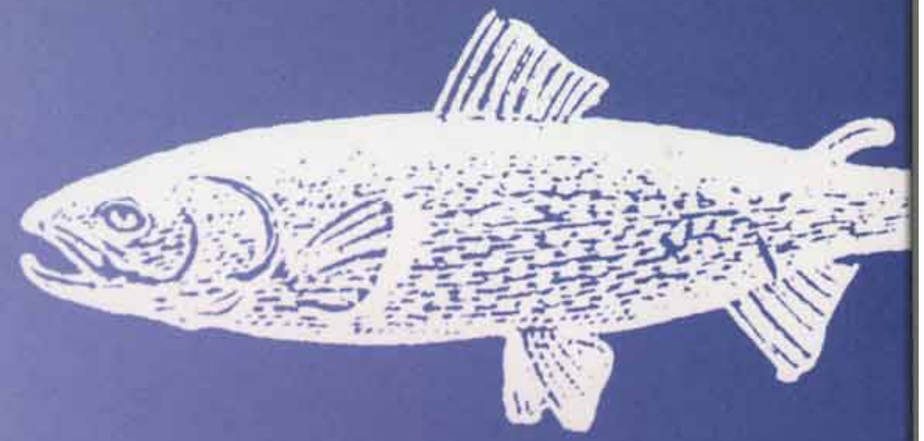

Future Developments in Farm Animal Breeding and Reproduction and their Ethical, Legal and Consumer Implications (BIO4-CT98-0055), an EU-funded project, commenced in September 1998. Following growing public interest in GM crops and cloning, the project was set up to explore the legal, ethical and consumer issues raised by the modern animal breeding sector. An important aim was to encourage informed and wide-ranging discussion of these issues, and this leaflet has been prepared with this aim in mind. It is hoped that specialists and non-specialists alike will find the leaflet of interest.

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November 1999

This project was funded by the European Union.