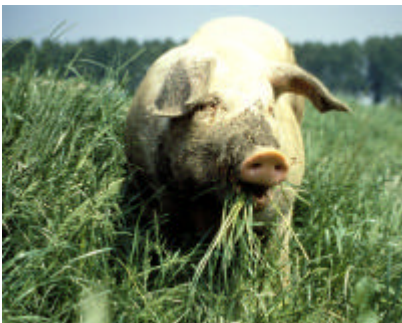


Compassion in World Farming Trust
EDUCATING HUMANE CITIZENS

farm animal welfare and the curriculum



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ISBN 1 900156 27 X



**Education and Research Department
 Compassion in World Farming Trust**

5a Charles Street, Petersfield, Hampshire, GU32 3EH, UK
 Tel. +44 (0)1730 268070/268863 Fax. +44 (0)1730 260791
 E. ciwftrust@ciwf.co.uk www.ciwf.org



Compassion in World Farming Trust is an educational charity working internationally to advance farm animal welfare.
 Reg. No. (UK) 295126

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This report from Compassion in World Farming Trust examines how well the UK education system enables young people to understand both the factual and the ethical aspects of animal farming. Animal farming is an almost universal human activity, contributing very significantly to the world's economy and food supply. The decisions we make about animal farming have important implications for animal welfare, as well as for human welfare, the environment and sustainability, which future citizens need to be able to understand and evaluate.

In this report we have reviewed how these issues are tackled in the National Curriculum and relevant GCE Advanced level courses, and in associated textbooks. While we welcome the fact that some consideration of the ethics of farming and animal breeding is required or recommended, our research shows that much more needs to be done to provide students with accurate and adequate knowledge of how animals are farmed and an understanding of how to make ethical assessments. Compassion in World Farming Trust believes that education policymakers and educationalists should now take further steps to include animal farming and farm animal welfare in the core curriculum of all relevant education courses.

Why the curriculum should include animal farming

.. People and animal farming

One of the most ancient and basic interactions between people and the environment is that of farming animals for food and useful materials. In modern society too, nearly everyone makes use of animal products, often unknowingly, every day. Animal farming accounts for around 2/3 of the world's agricultural land and animal products (milk products, meat, fish and eggs) form almost half of household food purchases in the UK and around 30% of our calorific intake. Animal farming has important implications for social organisation, natural resources and pollution, food safety, diet and health, in the UK, Europe and globally. Modern societies need citizens who understand the link between food and farm animals.

“Another common concern ... is the lack of connection between consumers and the way their food is produced...Initiatives are already being developed as part of Government's commitment to sustainable agriculture policies .. [such as] inclusion in the core curriculum of an understanding of animal welfare and food and nutrition, which will act to bridge this gap.” *Department for Environment Food and Rural Affairs, Outline of an animal health and welfare strategy for Great Britain, 2003.*

“A recent Farming and Countryside Education survey has identified disturbing gaps in children's knowledge of food and the countryside that are set to widen unless remedial action is taken...The survey highlighted a lack of understanding of the balanced food plate.. Children are not connecting [farming] with their source of food. Teachers need to be more forthright about what farming involves...There is an immense need for better education.” *Royal Agricultural Society of England, August 2003, reporting on a survey of 1300 school students aged 11-16 in England, Wales and Scotland.*

In the course of a lifetime the average UK citizen will consume the products of, at least, hundreds of farmed animals – including cows, sheep, pigs, chickens, turkeys and fish. The food choices that people make have many important consequences and one of these is to substantially affect the quality of life of those sentient farmed animals. Education can prepare future citizens with the information and the values they need to help them make their own ethical decisions about food purchase.

“ Sustainability and ‘humane education’

Global sustainable development cannot be achieved without justice and peaceful cooperation - both within and between nations and communities. Governments and educationalists have already recognised that education for the values of sustainability, which include mutual respect between people, can play an essential part in achieving an outlook that can help to overcome violence, poverty and environmental degradation.

This report argues that ‘humane education’ should be an essential part of education for sustainability. Humane education encourages compassion and respect for other people, for animals and for the environment and recognises the interdependence of all living things. The concept and practice of sustainability that is now recognised within schools and colleges should apply equally to the quality of life of farmed animals and other non-human animals in the human or natural environment.

“ Students’ perceptions and the educational curriculum

Animal welfare interests and concerns most young people. Students’ attitudes to animals typically include assumptions of sentience, individuality, preferences, intentions and emotions. But there is a discontinuity between these attitudes and the knowledge of animal farming practices and farm animal welfare that is provided by educational courses.

The use of farm animals is included explicitly in UK pre-university education (Science National Curriculum Key Stage 3 and 4 and GCE Advanced level Biology). While this is welcome, the controversial topics in animal farming such as close confinement, barren environments, mutilations, breeding for higher productivity, and methods of transport and slaughter, can only be discussed effectively in schools and colleges if sufficient factual information is available to students and teachers.

Compassion in World Farming Trust believes that much more needs to be done to ensure that students attain a better understanding of animal welfare in modern farming practice, and of the alternatives to intensive animal farming.

farmed animal facts and figures

800 million meat chickens are reared yearly in the UK, and 44 billion globally

10 million pigs are reared for meat yearly in the UK, and more than 1 billion globally

200 million dairy cows are kept globally producing 500 million tonnes of milk yearly

5 billion laying hens are kept globally, producing 50 million tonnes of eggs yearly

70 million salmon and trout are reared in fish farms in the UK annually

Over 1/3 of the world’s cereal harvest and 50% of the grain consumed by the UK is used for animal feed

Over 60% of freshwater withdrawn globally is used for irrigating crops, many of them destined for animal feed

Global meat consumption is predicted to rise by 56% from 1997 to 2020, most of this rise coming from less economically developed countries

1 Educational issues in animal farming

Our use of animals in farming is basic to most human societies and it is not surprising that this activity encompasses a wide range of educational issues:-

<i>Issue</i>	<i>Relevant subject area</i>
Economic and social importance to most human societies	Geography, citizenship, language and literature, food technology, business studies, economics
Environment: land and water use, waste, pollution, landscape and biodiversity	Life science, geography, citizenship, food technology, business studies, economics
Sustainability and global food supply	Science, geography, citizenship, ecology, biology, food technology, business studies, economics
Food safety: pathogens, veterinary medicines, antibiotics and hormones	Science, biology, citizenship, food technology, health education
Diet and human health: balanced diets, the 'Western' diet and alternatives	Science, biology, geography, food technology, citizenship, health education
Consumer knowledge and choice; informed citizenship, cost and value; 'ethical consumerism'	Citizenship, science, biology, health education, business studies, economics
Ethics: understanding the needs, behaviour and sentience* of animals; empathy; applying the ethical principles of wellbeing, justice and autonomy	Life science, biology, language and literature, citizenship, philosophy and religion

*recognised by the EU's basic law in 1997 (Treaty of Amsterdam)

Of the 7 issues given above, all are to a greater or lesser extent recognised in the UK secondary educational system, but the seventh still takes low priority. In spite of some welcome new initiatives, the examples given in this report will show that we have some way to go to incorporate understanding of the ethical, social and environmental issues in animal farming as an essential part of our education system in all relevant subjects.

2 Defining ethics in animal farming

For the study of ethics in schools, the three general ethical principles of wellbeing, justice and autonomy can be interpreted in more familiar terms as the values of *welfare*, *fairness* and *choice*. These are values that we commonly use when we decide on the acceptability or otherwise of particular practices or policies in society that impact on individual people or groups, and can be applied equally to animals. They can be used, for example in the form of an Ethical Matrix¹, to help assess the impact of different farming practices on each of the affected interest groups, including both humans and animals, and can also be applied to the environment. This type of evaluation is already in use by academics and policymakers.

¹ B Mepham, *Farming Animals for Food: towards a moral menu*, Food Ethics Council, 2001; B Mepham, *Ethics and Animal Farming: the Ethical Matrix, Teacher's Guide*, CIWF Trust 2003.

3 New horizons in 14-19 education

The structure and content of 14-19 education in the UK is likely to change over the next 5-10 years. The proposed reforms, announced by Education Ministers in 2003, aim in part for greater curriculum flexibility and closer ties between academic and vocational studies. This development creates important opportunities for young people to learn more about animal farming:-

- Future **Science education** is likely to give more emphasis to applications and issues, such as environmental pollution and genetic engineering. CIWF Trust would like to see a unit in the secondary Science curriculum on “*Farming animals for food and materials*”, to include the ethical dimension of agriculture and food production.
- Expanded **Vocational education** in areas involving food, such as catering, food retailing and tourism, could include topics on farm animal health, husbandry systems and their impact on animal welfare and the environment. This is not the norm at present.

These developments are likely to need additional and more detailed educational materials on animal farming to be available to teachers and students.

4 The National Curriculum and Education for Sustainable Development (ESD)

The Qualifications and Curriculum Authority (QCA) intends that Education for Sustainable Development should be an integral part of the National Curriculum, including Science, Geography and Citizenship, and of GCSE and AS/A level courses. There are requirements for ESD to be included in some subjects. The Authority has put resources into information for teachers on the importance of ESD and provided them with suggestions for how it can be integrated into various Curriculum areas and post-16 education. The issues to be taught include citizenship and stewardship, the needs and rights of future generations, diversity, quality of life, sustainable change and uncertainty and precaution. Notably, the welfare of farm animals, our relationship to and responsibilities for them, do not feature in the QCA’s initiative on ESD.

Defining sustainability

Sustainable development is currently defined in terms of improving the quality of life primarily for people. The Johannesburg Declaration 2002 called for a ‘humane, equitable and caring global society cognizant of the need for human dignity for all’. The protection of natural resources and an understanding of the interdependence of all life are acknowledged to be essential to the aims of sustainable development, but the emphasis is very much on human needs rather than on the intrinsic value of other living things and the natural environment. Nature includes a huge range of sentient animals in the human and natural environment and their interests deserve to be considered alongside the interests of people. Development must be sustainable for the non-human sentient life in the environment, as well as for soil, air, water and other natural resources. In particular, this requires humane and sustainable animal farming.

New educational initiatives in ESD

In early 2003 the UK government announced the setting up of a Sustainable Development Education Sounding Board to draw up an education strategy for England and involving a wide range of educational and other interest groups. Internationally, UNESCO is preparing an implementation scheme for the UN’s Decade of Education for Sustainable Development (2005-2014), one of whose aims is to review existing educational curricula.

CIWF Trust believes that any sustainable development education should include the understanding that farming must be sustainable for farmed animals as well as for the environment and for wildlife. This applies particularly to animal breeding, which at present is not dealt with adequately in the curriculum. ‘Sustainable’ farmed animals must be bred to be capable of growing healthily to maturity, capable of a normal lifespan and normal reproduction, and able to cope with climatic conditions and their environment. It is disappointing that KS3-4 Science topics on selective breeding and GCE Advanced level Geography pay little attention to the sustainability of farm animals in this sense.

CIWF Trust would like to see farm animal welfare included explicitly in the QCA’s and future Government initiatives on Education for Sustainable Development.

Sustainability of animal breeding

The EU Council Directive 98/58/EC concerning the protection of animals kept for farming purposes states: ‘No animal shall be kept for farming purposes unless it can be reasonably expected, on the basis of its genotype and phenotype, that it can be kept without detrimental effect on its health or welfare.’ (Annex, Para. 21)

“[The curriculum] should develop [pupils’] awareness and understanding of, and respect for, the environment in which they live, and secure their commitment to sustainable development at a personal, local, national, and global level.” The National Curriculum, 1999

CIWF Trust would like to see *humane and sustainable animal farming* included explicitly in the aims of Education for Sustainable Development

5 Ethics and farm animal welfare - how well are we doing?

The present National Curriculum (Key Stages 1-4) and Advanced GCE courses are now required to consider wide-ranging social and ethical issues, as well as teaching facts and techniques. This is to be welcomed. Many teachers are keen to include issues related to the ethical treatment of other species in their teaching in areas as diverse as science, English, geography, religious studies and citizenship. But for this to be extended to all classrooms, two essential pillars must be in place:-

- **The issue must be required specifically by the relevant Curriculum or Examination Board, and must be compulsory and properly examined/assessed**
- **Teachers and students must have ready access to sufficient factual information to enable reasoned ethical evaluation**

How well do the National Curriculum, the GCSE and Advanced examination boards, and educational publishers facilitate humane education in relation to our farm animals? How well is the connection made between the meat, milk or eggs in the supermarket and the lives of the animals in the field or in the shed?

This report concentrates on the Science National Curriculum and on GCE Advanced level Biology. We also make some comments on Geography, Citizenship and Design & Technology and we hope to look at these subjects and others in more detail in later reports.

6 The National Curriculum

The QCA states that “All National Curriculum subjects provide opportunities to promote pupils’ spiritual, moral, social and cultural development”. How are these opportunities used in subject areas most relevant to our use of farm animals, particularly Science, Geography and Design & Technology?

Key Stage 1 and 2 (age 5-11) Science

KS1 (age 5-7) Science includes the learning objective “how to treat animals with care and sensitivity”. KS2 includes “feeding relationships” and “food chains” in an environment. Farm animals are not mentioned specifically.

What is missing in primary science?

While welcoming the KS1 objective to learn “care and sensitivity”, CIWF Trust would like to see the KS2 topic on feeding relationships expanded to include the objective to “***understand how food for people is produced from farm animals***”.

KS 3-4 (age 11-16) Science

Learning about animal farming is directly or indirectly specified in the Science curriculum, for example:-

KS3 “ways in which living things and the environment can be protected, and the importance of sustainable development”

KS4 “the basic principles of cloning, selective breeding and genetic engineering”

KS4 “how food production and distribution systems can be managed to improve the efficiency of energy transfers”

Key Stage 3 Schemes of Work for Science

Unit 9A Inheritance and Selection. This unit includes:

- “characteristics in a plant or animal which are desirable in certain circumstances”
- “why do farmers produce new breeds of animals?”
- “how are new breeds of animal produced?” (for example dog breeds)
- “issues to be considered in relation to selective breeding”, optionally including “ethical issues”
- “identify ethical issues relating to cloning of animals”

What is missing?

- The welfare impact of selective breeding of farm animals is a serious omission. Damage to the health and welfare of farm animals associated with selective breeding for higher yield is well-documented
- CIWF Trust would like to see a topic in the Scheme of Work on **“health and welfare problems caused by farm animal selective breeding”**

Unit 9D Plants for Food. This unit includes:

- “where does our food come from?”
- “food chains representing a typical meal [students] may have eaten”
- “what animals are fed on farms”
- “management of food production may have implications for the animal and plant populations in the environment”
- “the case for and against intensive agriculture”
- “should pesticides be used to produce more food for humans at the expense of other animals?”

What is missing?

- There is inadequate emphasis on animal farming compared to the emphasis given to arable farming and wild species. While the latter are important issues, this imbalance is not justified on grounds of environmental impact and may lead to neglect of the topic of farm animal welfare
- CIWF Trust would like to see a Unit at KS3-4, analogous to ‘Plants for Food’, entitled **“Farming animals for food and materials”**

9G Environmental Chemistry

- “Acid Rain, pollution and global warming”

What is missing?

- There is neglect of the role of farm animal manure and the use of artificial fertilisers for animal feed production, important contributors to environmental pollution
- CIWF Trust would like to see a topic in this unit on **“pollution associated with intensive animal farming”**

GCSE Science

The Examination Boards state that they provide opportunities for consideration of : “Spiritual, Moral, Ethical, Social and Cultural Issues”, in relevant topics, for example in relation to:-

- “the management of ecosystems and sustainable agricultural practices”
- “the ethical implications of selective breeding”
- “the ethical implications of genetic modification”

Certain modules in the most widely used GCSE Science courses include topics relevant to the practice and ethics of animal farming, for example in:-

Ecology

- “human population growth and resource use”
- “intensive food production improves the efficiency of energy transfer by...keeping farm animals penned indoors”
- “sustainable development”
- “intensive farming raises ethical dilemmas”

Food production and the environment

- “interpret evidence about the costs and benefits of intensive farming to include the supply of heat, the use of pesticides, inorganic fertilisers and transport”

Variation, Inheritance and Evolution

- “cloning may pose ethical dilemmas”
- “selective breeding is used to develop crop plants and agricultural animals with desirable characteristics such as resistance to disease and high yields”
- “the ethical implications of selective breeding and cloning”

What is missing in KS3-4 Science?

Although there is a clear intention to include “ethical issues” related to farming, current specifications make it unlikely that animal welfare will be given sufficient emphasis, for the following reasons:-

- ethical principles (or “ethical issues”) are not defined and are likely to present problems for many science teachers
- an unbalanced concentration on plant crops as opposed to farm animals when considering farming issues
- a lack of factual information on the welfare impact of animal farming methods, which would be needed to underpin ethical evaluation of these methods. An example would be some of the well-documented health and welfare problems associated with selective breeding for higher yield

Vocational opportunity lost?

The GCSE in *Rural and Agricultural Science* (OCR) requires access to farm animals for practical work. The course includes units on the nutrition, diseases and reproduction of farm animals and on ‘land use issues’, including the sustainability of modern agriculture. *CIWF Trust was dismayed to note that there is no requirement in the course specification for the study of farm animal welfare.*

What the science textbooks say (KS4)

Textbooks have to cover a wide range of science and applications, including social and ethical issues. It is not surprising that they vary in the adequacy of their coverage of animal farming. In the context of sustainability, they raise the issue of the non-sustainability of a meat-based diet. Some raise the issue of animal husbandry methods, including “ethical objections” to intensive systems, which is to be welcomed. However, limitations include:

- factual information on animal farming, either related to welfare or to environmental pollution and resource use, is very much less than that devoted to arable farming
- factual details of the health and welfare problems associated with selective breeding and genetic engineering of farm animals are not provided
- although the confinement of animals indoors is presented as an “ethical issue”, the reasons given for criticising the practice may be unclear or even misleading
- students are arguably receiving a sanitised view of common practices involved in animal farming. The exclusion of topics such as early weaning, mutilations, sale, transport and slaughter fails to give a balanced picture of normal farming practice

- as a result of the lack of adequate information, ethical evaluations are presented as matters of opinion, rather than being founded on facts and values

Duty of care? The section on ‘Food Production’ of a 2002 textbook for AQA GCSE Biology states, “Sadly in the past some farmers have neglected this duty of care [to the environment].” No mention is made at this point of the duty of care to farmed animals.

“Battery farming is practised to minimise energy loss from the food chain. Ask pupils to consider how chickens save energy by living in cramped conditions with food supplied, and a constant temperature maintained in the sheds. Possible ideas include: less energy wasted in movement, less energy wasted finding food, less energy wasted keeping warm, no predators. All these allow animals to invest more energy into producing eggs. More able students could consider the ethical implications of battery farming.”

Teaching Biology to KS4: non-specialist handbook, Hodder & Stoughton 1999

“At KS4 double and single award, pupils must appreciate the reasons for intensive farming methods, and appreciate their environmental effects.” **Teaching Biology to KS4: non-specialist handbook, Hodder & Stoughton 1999**

“In intensive farming methods, animals like pigs and chickens are often kept indoors in temperature-controlled conditions. They do not have to look for food because it is provided by the farmer.”

Biology for OCR A, Heinemann 2001

“Other people argue that if we were all vegetarian, eating plant produce but no meat, we would need to grow fewer crops.” **Biology for OCR A, Heinemann 2001**

“Intensive farming of animals raises an ethical problem....A growing number of people do not like this form of farming. They claim that it is the wrong way to treat animals and are calling on farmers to go in for more free-range farming where animals are free to live outside in fields and outdoor pens.”

Revise for GCSE Science, Heinemann 1999

“Many people do not like to see animals grown in these conditions [of intensive chicken rearing]. They think that it is more humane for them to be outside.” **Biology for You, Nelson Thornes 2002**

“The danger of selective breeding is too much inbreeding.” **Biology for You, Nelson Thornes 2002**

“A vegetarian diet can support far more people... This is because we are cutting down the 90% ‘wastage’ of energy that occurs between each trophic level.” **Biology for You, Nelson Thornes 2002**

“Many of the methods used to improve the efficiency of food production led to the practice of ‘factory farming’. Many people consider the confining of animals, especially chickens, in a restricted space and feeding them a specially prepared diet to be cruel. Only recently has there been pressure on farmers to improve the conditions under which animals are reared.”

GCSE Biology (AQA), Hodder & Stoughton 2002

“Intensive farming of animals such as battery-hens, and crated veal calves, is simply indecent.”

GCSE Double Science Biology: The Revision Guide, Higher Level, CGP, 5th Edition

“Some people think it is wrong to manipulate nature to force the evolution of animals for our benefit only. For example to produce cows that would die if we didn’t milk them, because we’ve bred them to produce too much milk. Or to breed pigs with so much meat on them that they can’t stand up. Some think it’s cruel and wrong and others think it’s just what we need to provide nutritious food at cheap prices.”

GCSE Double Science Biology: The Revision Guide, Higher Level, CGP, 5th Edition

“Did you know? Artificial insemination has meant that sperm can be taken from bulls and put into the best cows much more easily than when the cow or bull had to be taken to a farm!”

GCSE Biology (AQA), Hodder & Stoughton 2002

“In the 1950s strains of bacteria were appearing that were unaffected by penicillin. ...Some of the main problems of this time were that...farmers and vets were using large quantities of antibiotics on food-producing animals [emphasis added]”. **GCSE Biology (AQA), Hodder & Stoughton 2002**

“Since the 1960s antibiotics have been used as growth promoters in the intensive rearing of poultry, pigs and cattle. The users believe that the antibiotics help the animals get fatter quicker and eat less food, although there is a lack of scientific evidence to support these beliefs. Because the antibiotics fed to the animals are similar to those used to treat food poisoning infections in humans, many cases of food poisoning are difficult to treat.” **GCSE Biology (AQA), Hodder & Stoughton 2002**

“This moral question stuff is all lumped together and called “ethical issues”. No matter what you believe, to get the marks for a question on this, you’ve got to learn what the different issues are.” **GCSE Double Science Biology: The Revision Guide, Higher Level, CGP, 5th Edition**

KS3 Design and Technology - Unit 9A(i) Selecting materials: Focus: Food

- “investigate the basis of concerns about biodiversity, genetically engineered crops and the use of growth hormones and antibiotics in the production of food, e.g. meat”
- “carry out a life-cycle analysis of a food and explain the impact on the natural environment of the extraction and production of the ingredients, e.g. crops, livestock, farming”
- “how well a product meets moral, cultural and environmental considerations”

CIWF Trust would like to see farm animal welfare included explicitly in investigations into food materials in the D&T curriculum

Cloning fact and fiction

We were concerned to see a misleading and sanitised account of the process of cloning ‘Dolly the sheep’ in GCSE textbooks which is not consistent with published scientific literature on the subject. The process shown in a diagram involves only 2 sheep and is explained:

“An egg cell is taken from Sheep B and its nucleus removed. This is replaced with the nucleus of a cell from Sheep A. The resultant cell divides to form an embryo and is implanted back into Sheep B’s uterus from where it will develop into a new lamb: a clone of Sheep A”.

Teaching Biology to KS4: non-specialist handbook, Hodder & Stoughton 1999; Biology for OCR A, Heinemann 2001; Salters GCSE Science, Year 11, Heinemann 2002

This is incorrect, since the most common method of sheep cloning developed in the UK involves 4 different sheep: a body-cell donor (providing DNA), an egg-cell donor, a temporary recipient for the reconstructed embryo and the surrogate mother. Some of these sheep may be killed for the removal of eggs, embryos or failed foetuses. The account is also misleading, since few cloned embryos develop into live and healthy lambs. An experiment by a UK-based company using this method, reported in 2000, created 417 embryos and utilised 227 adult sheep, most of them killed, in order to produce 3 surviving cloned lambs. In the experiment 14 cloned lambs were born live, 11 of these died and a further 5 lambs were born dead.¹

If young people are to be enabled to consider the ethics of new technologies, it is essential that the information they are given is accurate on ethically relevant aspects, including wastage of animal lives or animal health and suffering.

¹ McCreath K J *et al.*, 2000. *Nature* **405**:1055-1069

7 New GCSE Science initiatives

With the aim of making secondary science education more relevant to the experience and future of students, new context-based courses are being introduced which put more emphasis on social and ethical issues in the application of science and technology. We would hope that these will allow much greater scope for the discussion of the practice and ethics of farming animals for food.

GCSE Applied Science (Edexcel, OCR and AQA)

Unit 2: Science for the needs of society

This course specifies that Spiritual, Moral, Ethical, Social and Cultural issues can be raised in the topics on “farming methods and genetic engineering”. In particular, ethical, moral and environmental issues are to be included in the “recognition of the intensive/organic farming debate”. It is very welcome that factual detail on animal farming is included:-

- “describe how intensive farming ...increases meat production by using controlled environments”
- “know that wool, silk, leather, pharmaceutical products and dyes are also obtained from living organisms”
- “describe how organic farming ... keeps animals under more natural conditions”

What is missing?

- the animal welfare impact of selective breeding and genetic engineering, in particular breeding poultry and cattle for higher yield
- the animal welfare impact of intensive production of milk and eggs

Nuffield Salters GCSE pilot: Science for the 21st Century

This curriculum is likely to be the model for new approaches to secondary science education which focus on issues important to the citizen. It will include a module on Food Matters and is likely to include the genetic engineering debate.

CIWF Trust would like to see ‘issue-based’ Science GCSE courses deal explicitly with human responsibility for farmed animals kept for food and materials production

The Way Ahead 1: The Citizenship Curriculum

In August 2001 Citizenship became a compulsory subject in the National Curriculum for 11-16 year olds. Unit 5 of the KS3 Scheme of Work (*How the Law Protects Animals*) is an indication of what could be done to include the issue of human responsibilities towards farm animals in other educational areas.

CIWF Trust very much welcomes the inclusion of animal protection in the Citizenship Curriculum. We believe that, in addition, the facts and ethical dimension of animal farming should be integrated into the teaching of *all relevant subjects*, especially Science and Geography. One element of this could be a Unit on “*Farming Animals for Food and Materials*” in the secondary Science curriculum.

KS3-4 Geography

Education in geography seeks to create an understanding of both the variety and the interdependence of places, people, activities and resources. Industrial methods of animal farming and their spread to less economically developed countries are prime examples of this interdependence, as they have major impacts on farmers, communities and resource use internationally, as well as on the quality of life of farm animals. The following are examples of where these issues could be raised:

- Unit 14 of the KS3 Scheme of Work *Can the earth cope? Ecosystems, population and resources*: students select for study a 'resource issue' such as food production, nutrition or agriculture
- "Economic Activities: The interaction of factors affecting agricultural land use ...e.g. dairying in North Yorkshire....or 'slash and burn' in Brazil" and "Examples from UK or EU to illustrate set aside, milk quotas, hedgerow removal, diversification" (OCR GCSE Geography A)
- Optional Unit: *Use and abuse of the environment - farming* (Edexcel GCSE Geography B) includes:
 - Why are farming methods changing?
 - How do modern farming methods modify the environment?
 - How may people and environments be affected by the development of GM food and crops?
 - Is organic farming a viable alternative method?
 - How are fragile environments at risk from farming practices (deforestation and desertification)?
 - What measures can be taken to ensure sustainable development in those circumstances?

Arable farming, dairy farming and grazing are covered in the examples given above. Insufficient attention is given to the fast-growing sectors of animal farming internationally, namely pig, poultry and fish farming. There seems to be no requirement to discuss the rapid spread of intensive methods of animal production to less economically developed countries, with its associated demand for animal feed and waste disposal, or to consider animal welfare. CIWF Trust would like to see a case-study topic in secondary Geography on **"The impact of the global spread of intensive animal farming on the environment, animal welfare and local communities"**.

8 Advanced GCE Biology (AS/A2)

The most widely-used GCE Advanced level Biology courses offered by Edexcel and OCR aim to include "Spiritual, moral, ethical, social and cultural issues" in such topics as:

- "the biosocial implications of intensive food production"
- "potential social, economic, ethical and environmental implications of biotechnology and gene manipulation"

and in general to enable students to "consider ethical issues..and help raise awareness of the decisions that may be taken at a personal and wider national and international level relating to the effects of human activities".

Course modules concerned with the environment and food production provide some opportunities for studying the methods and ethics of our use of farm animals, for example in:-

Environmental Biology

- "describe the causes and effects of eutrophication"
- "distinguish between intensive and extensive food production"
- "the impact of agriculture on the environment"
- "organic farming"
- "appreciate the implications of intensive food production in terms of the effects of farm waste on the environment, land reclamation and the destruction of hedgerows"

Genetics, evolution and biodiversity

- “discuss how intensive food production may affect wildlife and explain how farming practice can enhance biodiversity”
- “discuss the potential of genetically modified organisms, illustrated by the development of crop plants resistance to herbicides, the improvement of crop quality and the development of pharmaceutical products such as human hormones and new drugs”
- “discuss the social, ethical and economic implications of the development of genetically modified organisms”

Microbiology and Biotechnology

- “appreciate the potential social, economic, ethical and environmental implications of biotechnology and gene manipulation” in food production, but not including farm animal biotechnology
- “Information could be supported by data from the food industry and companies involved in genetically modified crops”
- “understand antibiotic resistance and the reasons for its spread”

Applications of Genetics

- “explain, with practical details, how the process of selective breeding may be carried out in one named plant and one named animal example”, including progeny testing, artificial insemination, in vitro fertilisation and embryo transfer
- “discuss the ethical implications of the use of artificial insemination, in vitro fertilisation and embryo transfer in animals and their social and ethical implications in humans”
- “describe one use of genetic engineering in agriculture”
- “discuss the ethical implications of genetic engineering”

Food Science

This module does not require any consideration of farm animal husbandry or welfare.

What Advanced Biology textbooks say

As in GCSE textbooks, “ethical issues” are raised relating to animal reproductive technologies and intensive farming, which is to be welcomed. There is a range in how well these issues are explained. We are concerned that in many cases: -

- Factual information is often missing on animal welfare aspects of selective breeding of farm animals
- Ethical issues may be mentioned briefly at the end of a section, without supporting factual evidence. This may send a message that that ethics are merely matters of personal opinion and therefore need not be taken very seriously in a science course
- There is a concentration on arable farming and non-animal food products, with much less attention paid to animal farming and its consequences, such as feed production, waste disposal, and resource use
- Protection of countryside and wild species is presented as an important issue, while protection of farm animal welfare is not mentioned
- A misleading impression is given that successful applications of farm animal genetic engineering are already in commercial use, for food or pharmaceutical production
- There is a failure to mention animal suffering and wastage of animal lives associated with genetic engineering and cloning experiments

“Ethics are sets of standards by which a particular group of people agree to regulate their behaviour... Ethics change with time, because people alter their views according to their knowledge and experience.”

Applications of Genetics, Cambridge Advanced Sciences, 2000

“Questions. What sacrifices are made in the drive for increased food production? Some points to consider include animal welfare, quality, taste, diminished gene pool, loss of natural habitats, use of energy.”
Genetics, Evolution and Biodiversity, Nelson Advanced Science, 2001

“There are numerous advantages in the use of artificial insemination [for animal breeding]... Also, since AI is an unnatural process, some people think that using it shows a lack of respect for animals.”
Applications of Genetics, Cambridge Advanced Sciences, 2000

“Ethical objections can be raised against some or all of these procedures [i.e. artificial insemination and embryo transfer in animal breeding] in that the animals concerned are not only denied their natural instincts and behaviour, but are being used by the animal breeder as a means to an end.” **ibid.**

“Breeds of sheep, cattle, pigs and poultry have been selected which have terrific rates of growth and bulky muscles. Many such animals are never intended to survive to maturity and there is concern for their welfare as their bones are sometimes not strong enough to hold their weight.”
Environmental Biology, Cambridge Advanced Sciences, 2000

“Most intensively farmed animals are kept at much higher densities than is generally considered natural and the chances of them catching diseases due to stress and overcrowding are high. To counteract this, animals are often routinely fed with antibiotics, a practice which is now considered undesirable as it increases the selection of bacteria that are resistant to many antibiotics.” **ibid.**

“[O]ver the last decade transplantation of animal organs into humans has become a realistic goal... Some people feel it is unethical to breed animals for this purpose”.
Microbiology and Biotechnology, Cambridge Advances Sciences, 2000

“Ethical implications. Many people feel that it is morally wrong to genetically engineer animals purely for human benefit.” **ibid.**

“In principle, plant and animal selective breeding is the same. In practice, however, animal selective breeders face several problems, particularly when dealing with mammals. Many of the mammals involved are large. They take time to reach maturity, gestation periods are long, and the number of offspring produced is small. Some of the techniques of animal breeding...such as artificial insemination, embryo cloning and embryo transplantation, help to overcome these problems.”
Applications of Genetics, Cambridge Advanced Sciences, 2000

“Despite concern over the possible link between BSE in cattle and certain degenerative brain disorders in humans, such as Creutzfeldt-Jakob Disease (CJD), there is little or no evidence of BSE being passed onto another species via the food chain.”
Animal Science in Action, Hodder & Stoughton, 1995 (reprinted 1999)

Avoidance of bias?

“There are great possibilities for genetic engineering techniques in improving farm animals.”
Microbiology and Biotechnology, Cambridge Advanced Sciences, 2000

What is missing in Advanced Biology?

The inclusion of animal reproductive technology and the environmental effect of intensive farming in these courses is to be welcomed. However, we believe that a number of issues need to be given much higher profile in the course:

- More details are needed on animal welfare in AI and embryo transfer and also on other science-based breeding and husbandry practices. Examples are the production of multiple births in breeding ewes, the use of rapid cycles of reproduction in breeding sows and dairy cows and the selective breeding of dairy and beef cattle and meat chickens. These are dependent on intensive nutrition and veterinary techniques and all have well-documented welfare implications

- There is an over-emphasis on the environmental impact of arable farming compared to the impact of animal farming, and a neglect of pollution and resource use associated with the intensive farming of pigs, poultry and dairy cows
- There is a failure to make a clear moral distinction between issues involved in the breeding and management of plant crops in contrast to the breeding and management of sentient animals

The Way Ahead 2: Salters-Nuffield Advanced Biology (Edexcel)

This new Advanced GCE Biology syllabus aims to enable students to “consider moral and ethical issues in the context of actual situations”. Unit 5 of the course contains a Topic on the brain and nervous system and specifies that students should be able to;

“Discuss the moral and ethical issues related to the use of animals in medical research”.

CIWF Trust would like to see a similar requirement in appropriate units of Advanced Biology and Geography courses to *“Discuss the moral and ethical issues related to the use of farmed animals in food production and other industries”*.

Advanced GCE Geography (AS/A2)

Modern education in geography includes issues such as the fair distribution of global resources and protection for the environment and wild species. Advanced Geography GCE course objectives include the consideration of “spiritual, moral, ethical, social and cultural issues”, support for “the development of Environmental Education, especially in relation to Sustainable Development”, and consideration of “the morality of everyday decisions which have a geographical dimension”.

A module on *Issues in the Environment* includes consideration of:-

- “Food supply”
- “impact of modern food production on the environment”
- “production of major crops and livestock”
- “intensive arable and hill farming in the UK”

There appears to be no requirement to consider the ethical implications of animal husbandry practices in this module. CIWF Trust sees this as a serious omission, in view of the vital environmental role of animal farming globally. Notably, “hill farming in the UK” excludes the most intensively farmed animal species (pigs, poultry and dairy cows). CIWF Trust would like to see a required topic on *“Environmental and ethical issues in intensive animal farming, in the UK and globally”*.

9 Ethics and information

The study of ethics is based on reasoned argument, facts and principles, in a similar way to the study of science¹. Students need the relevant facts and understanding of the relevant ethical principles in order to make ethical evaluations of animal farming practices. The subject is not done justice by formulations such as “some people have ethical objections” or “cultural beliefs” about a subject.

Courses both at GCSE and Advanced GCE are now required to include very wide topics related to farming and commercial practice, as well as the scientific or factual material. It is challenging to cover these adequately, especially in fast-changing fields such as biotechnology. We have found factual information on farm animals given in recommended textbooks that is incorrect, incomplete or otherwise misleading. This emphasises the need for educational materials that cover the factual and ethical aspects of animal farming.

¹ See M J Reiss, How we reach ethical conclusions, *Key Issues in Bioethics: a guide for teachers*, ed. R Levinson and M J Reiss, RoutledgeFalmer, 2003, chapter 2.

10 Conclusions:

➤ Learning about humane and sustainable farming

The relationship between people and other species is not an add-on issue. The future of human society may well depend on our ability to live peacefully and sustainably, by taking more seriously than we do now our responsibilities to other human communities, the environment and other animals. In particular, animal farming is one of the most wide-reaching of human activities and its products are an important part of most people's lives.

In the National Curriculum (KS3-4) and Advanced GCE Biology, the consideration of some "ethical issues" in relation to both intensive farming and animal breeding is already required. But this report has shown that:-

- relevant ethical principles are not adequately defined
- inadequate attention is given to understanding the role of animal farming in relation to use of natural resources and environmental pollution
- inadequate attention is given to the understanding of animal welfare in normal farming practice, for example in intensive and organic farming systems
- inadequate attention is given to the understanding of the welfare implications of selective breeding, genetic engineering and cloning of farm animals
- there is a failure to recognise animal sentience as a primary consideration in farm animal management

➤ What is needed

CIWF Trust would like to see the issue of humane and sustainable animal farming included in the core curriculum for all relevant educational areas at primary and secondary level. These would include all life sciences, food science, animal science and agriculture, environmental sciences, geography and citizenship.

In general, we suggest that:

- the issue of humane and sustainable animal farming should be included in current discussions on the future of 14-19 education and be given higher priority in new courses or curricula that are developed
- current and future initiatives on Education for Sustainable Development should include concern for the welfare of farmed animals and of all sentient non-human animals in the human or natural environment
- our educational system should aim to produce competence in ethical assessment or 'ethical literacy' in all subjects areas that involve human interactions with non-human animals and the environment

In particular, we suggest that the following learning objectives, course units or topics should be included in the current National Curriculum, in Advanced level GCE courses and in future curriculum development:-

- a learning objective *“understand how food for people is produced from farm animals”* in the primary Science Curriculum
- a Unit *“Farming Animals for Food and Materials”* in the secondary Science Curriculum, analogous to the existing KS3 Unit *Plants for Food*
- a topic *“health and welfare problems associated with selective breeding of farm animals for higher yield”* in the existing KS3 Science Unit *Inheritance and Selection* or at KS4
- a topic *“pollution associated with intensive animal farming”* in the existing KS3 Science Unit *Environmental Chemistry* or at KS4
- a topic *“impact of the global spread of intensive animal farming on the environment, animal welfare and local communities”* in the secondary Geography Curriculum
- a topic *“farm animal husbandry and welfare”* in the existing KS3 Design and Technology Unit *Selecting Materials:Focus:Food*
- a topic *“the moral and ethical issues related to the use of farm animals for production of food and other materials”* in Advanced Biology GCE courses
- a topic *“environmental, social and animal welfare issues in intensive animal farming, in the UK and globally”* in Advanced Geography GCE courses
- the topic of *humane and sustainable animal farming* to be included in the QCA’s recommendations to teachers on Education for Sustainable Development
- recommendation by the QCA and Examination Boards of factual and educational materials on animal farming produced by animal protection NGOs. This would balance existing recommendations for the use of material from industry sources

Checklist of education on humane and sustainable animal farming

KS3-4/GCSE and Advanced GSE in Science and Biology

CIWF Trust has made an assessment of courses and textbooks at KS3-4/GCSE Science and GCE Advanced level Biology for the 10 issues listed below.

** = adequately acknowledged/well explained

* = partially acknowledged/explained

x = inadequate treatment or no mention

xx = misleading, because factually incorrect or incomplete (textbooks)

Issue	issue acknowledged?		issue explained?	
	KS3-4 / GCSE	AS/A2	KS3-4 / GCSE	AS/A2
need to consider 'ethical issues' in animal farming	*	*	x	x
statement or definition of relevant ethical principles	x	x	x	x
definition of intensive farming of animals and of their welfare	*	*	*	range * - x
relation between human diet and farm animals	*	*	range * - x	x
farm animal sentience	x	x	x	x
farm animal natural behaviour	*	*	x	x
human responsibility for animals we control and use	x	x	x	x
ethics of selective breeding, reproductive technologies (AI, ET), genetic engineering and cloning	range * - **	*	range * - xx	range * - xx
environmental impact of intensive poultry, dairy and pig farming	x	x	x	x
farm animal welfare and global food supply	range * - x	range * - x	range * - x	x

Sources: the National Curriculum (Science, Geography, Design & Technology); GCSE Science double award specifications (OCR and Edexcel Boards); Advanced GCE Biology specifications (OCR and Edexcel Boards); selected textbooks as referenced in text of this report.

Materials for secondary and college courses

CIWF Trust produces educational materials designed to help teachers and students approach ethical issues in the human use of farm animals. These include factual information on intensive animal farming, farm animal behaviour, the welfare aspects of farm animal breeding, resource use and pollution, social and economic implications and relevant ethical principles. Our latest materials include:

- **Farm Animals & Us:** video and Teacher's Pack, including lesson plans, factual information and discussion exercises, targeted for the KS 3-4 Science Curriculum
- **Farm Animals & Us 2 - feeding the world without cruelty to animals:** video designed for 16+ life sciences, geography or citizenship
- **Intensive Farming of Animals:** 24-page illustrated student booklet, including welfare of pigs, poultry and dairy cows, with sections on selective breeding and organic farming
- **Ethics and Farm Animals - the Ethical Matrix:** Innovative and informative Internet-based exercise in ethical decision-making, for 6th form and college students in biology and related subjects. Students score animal farming systems according to their impact on farmers, consumers, farm animals and the environment. Developed at University of Nottingham Centre for Applied Bioethics, in collaboration with CIWF Trust. Includes Teacher's and Student's Guides. Accessible at www.ethicalmatrix.net
- **Animal sentience website - www.animalsentience.com.** Includes definitions and examples from animals at home, in the wild and on farm, plus discussion forum, feature articles, literature and film section
- **Citizenship resource - Campaigning for Farm Animals.** Student booklet and teacher's guide, designed for KS 3-4 Citizenship Curriculum but also useful for older students. Includes factual information and activities on animal farming and on political campaigning for farm animal protection at UK, EU and global level
- **Genetic Engineering and Cloning of Farm Animals,** video and activity pack designed for 16+ biology courses but includes useful discussion material for other subject areas
- **Referenced reports** bringing together information on intensive animal farming and the environment; animal sentience, farm animal genetic engineering and cloning; farm animal reproductive technologies; intensive animal farming and developing countries; fish farming; and other topics on farm animal welfare, suitable for use by teachers and older students

Further details and materials available from:

Education and Research Department
Compassion in World Farming Trust
5a Charles Street, Petersfield, Hampshire, GU32 3EH
UK
T. +44 (0)1730 268070/268863
F. +44 (0)1730 260791
Email: ciwftrust@ciwf.co.uk
www.ciwf.org