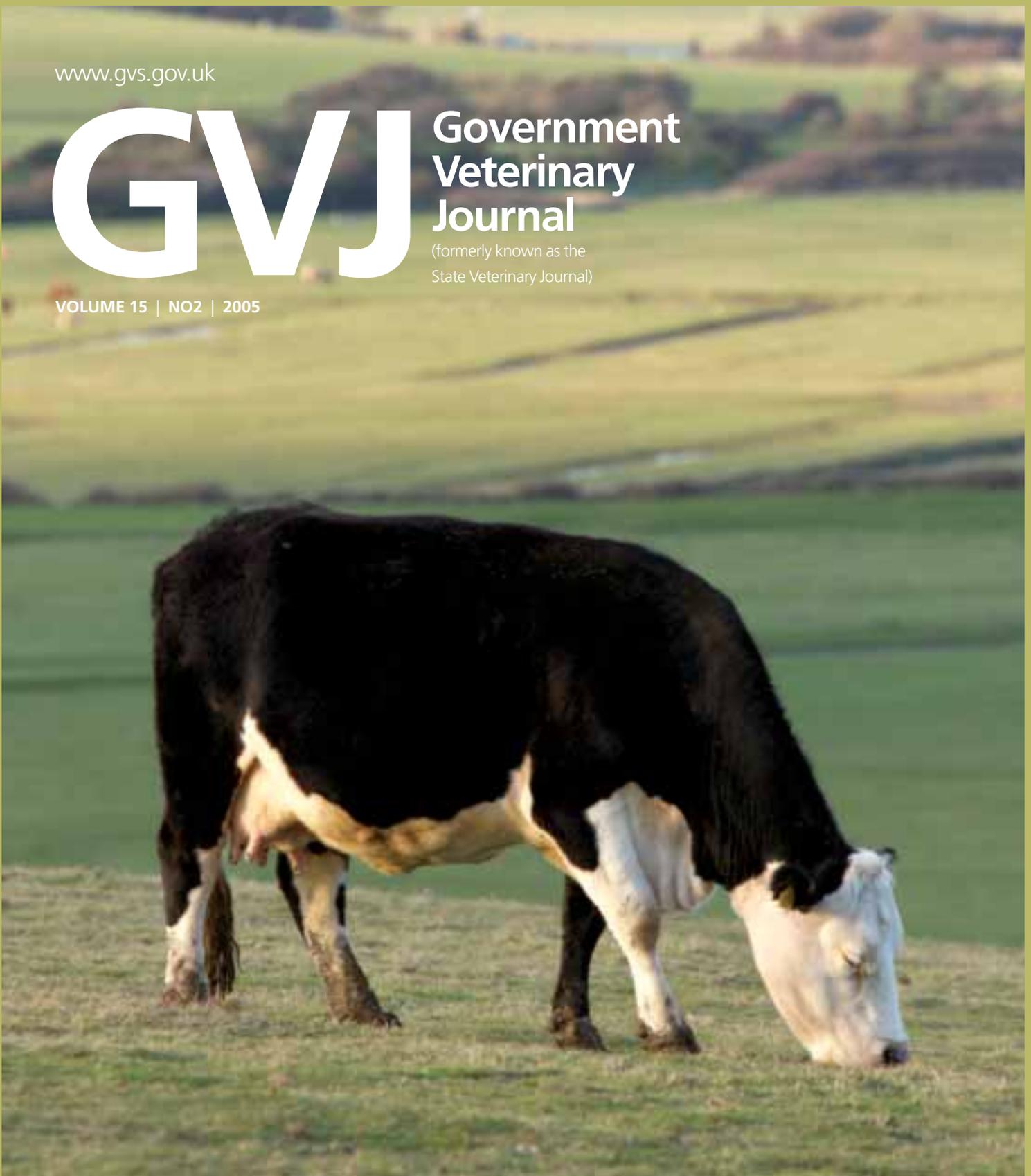


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# GVJ

**Government  
Veterinary  
Journal**  
(formerly known as the  
State Veterinary Journal)

VOLUME 15 | NO2 | 2005



The Government Veterinary Journal (GVJ) is the official journal of the Government veterinary service and those who support its work or have an interest in state veterinary medicine. It is compiled and produced by the Department for Environment, Food and Rural Affairs (Defra) for and on behalf of veterinary surgeons and those who support them across all parts of Government.

Its key aims are to enhance the contribution of veterinary expertise within and across government, promote the work of Government veterinary surgeons and provide a range of technical, factual and interesting articles in the fields of:

- Disease control
- Animal welfare
- Public health
- Consumer protection

It is intended that the GVJ will also highlight progress in relation to the Animal Health and Welfare Strategy and focus on issues identified by the Veterinary Head of Profession in Government.

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### **Are you interested in writing for the GVJ?**

Ideally, articles should be 1,000-3,000 words long, preferably with related illustrations. Full instructions for authors are available from any board member or the Production Team. Subject matter should be related to Government veterinary medicine in its broadest sense, and you do not have to work for Defra or the State Veterinary Service to be a contributor to the Journal. Articles for consideration can be submitted through any board member or the Editor (via the Production Team), a full list of which appears above.

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## Foreword

Welcome to the latest edition of the **Government Veterinary Journal**, as it will be known from now on. Retaining the essential character of the State Veterinary Journal, the newly rebranded publication will continue to inform and educate readers, whilst intending to broaden the readership to encompass every aspect of work in which Government involves vets. We hope that the new name and style will soon become as familiar to you as the previous version. During its existence, the Journal has existed in a number of different formats; however, the underlying intention of the publication has always been to provide information and to record historical events as they happen.

We have an article in this issue by Tinu Lebechi, outlining the current arrangements for developing the Head of Profession role of the Chief Veterinary Officer, and planned work to promote good working relationships between Government vets. The GVJ is clearly a part of that plan, and in keeping with this theme, we have included a summary of the findings from the customer survey included in the previous edition, and would like to thank all those who responded.

The article about animal by-products is a timely one, as this work is becoming increasingly complex and time consuming. Similarly, fish welfare is a relatively new area of work and awareness for many people. On the other hand, the Chillingham herd has been in existence for some considerable time, and animals have inhabited Dartmoor for even longer. All these subjects are addressed in this issue, together with an article by Diane Newell and Teresa Belcher dealing with the interesting topic of encouraging communication between vets and doctors.

As we aim to reach out to a wider audience of Government vets in the future, we hope to be able to bring an even greater spectrum of subjects and perspectives. We have also produced a commemorative edition, celebrating the 60th anniversary of the Journal which helps to illustrate the changes which have occurred over the years. We hope that you continue to enjoy and benefit from the Government Veterinary Journal in the future.



Linda Smith, Editor

# Management of the Chillingham Wild White Cattle

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Widdows

## Introduction

**The Chillingham Wild White Cattle have a unique place in the British fauna. They are one of the very few herds of cattle anywhere in the world that have a natural sex ratio and age distribution, and there is no castration nor culling. This article looks at the herd from a veterinary point of view. Livestock and wildlife legislation in the UK was not drafted with free-living cattle in mind, and this article outlines the steps that are taken to ensure compliance.**

## History

Chillingham cattle are small (mature bull 300 kg in winter) animals of unimproved type, resembling medieval animals in size

and conformation. Accounts of their history are legion: Hall (1989) and Ingham (2003) give summaries. The cattle are included in the standard world catalogue of livestock breeds (Porter, 2002) and feature in the national inventory of livestock genetic resources (DEFRA, 2002). The herd – currently 57 in number – is kept at Chillingham Park, Northumberland, which they share with 300 breeding ewes and their followers, the subject of a separate grazing tenancy; about 150 fallow deer also live in and around the Park. The number of cattle in the herd fluctuates but is now relatively stable, the last major variation being the reduction to five bulls and eight cows in the harsh winter of 1947. There is a reserve herd near Elgin in north-east Scotland.

The herd and Park are owned and managed by the Chillingham Wild Cattle Association (CWCA, The Warden's Cottage, Chillingham, Alnwick, Northumberland NE66 5NW, tel. 01668 215250; [www.chillingham-wildcattle.org](http://www.chillingham-wildcattle.org)). This is a registered charity, which is currently (May 2005) running a major appeal for funds to conserve the Park, develop visitor facilities, enhance biosecurity, and provide an endowment to secure the future of the herd.

Within the Park, 10.6 ha of replanted woodland are fenced off, so the herd have access to 123.4 ha of pasture of which 41% carries dense bracken cover, much of it under trees. There is also access to steeply sloping heather moorland which the cattle seldom if ever use. Including the fallow deer, the total stocking of the Park at present (about 0.48 livestock units per hectare) is at the mid-point of the range of stocking

**Figure 1**  
Chillingham Herd  
grazing in open  
parkland



1



densities practised by the National Trust on acid grasslands (Hearn, 1995).

Since at least 1721 the cattle have received hay in winter. This is now purchased locally from an organic farm and samples sent for laboratory analysis for feeding value. The policy is to feed the best hay early in the winter in an attempt to maintain condition. Compound feed approved by the Soil Association is also provided in winter, in an attempt to improve the nutritional status of calves.

In early 1980 several cows died as a result of magnesium deficiency and since then magnesian limestone has been applied on a rotational basis to 6 ha each year (6 tonnes per hectare). Since 1992, a programme of bracken cutting has been undertaken in order to increase the supply of herbage.

### Scientific research

The Chillingham herd affords an opportunity to study the natural behaviour patterns of cattle in a situation free from human interference, and scientific studies have been made (Hall, 1989; Visscher et al., 2001). The cattle show an unprecedented lack of genetic diversity whether assessed by blood groups and biochemical polymorphisms or by microsatellites, which are non-functional genes of great value as genetic markers. The latter study estimated that only 1.3% of the ancestral heterozygosity remains; perhaps harmful recessive genes have been purged from this highly inbred herd.

The herd breeds true for colour (white with red-brown ears, some red-brown markings on the face and a small and variable degree of black spotting on the shoulders). All animals are horned.

**Figure 2**  
Herd grazing in dense bracken

**Figure 3**  
Grazing in woodland

**Figure 4**  
Pasture with bracken and dense woodland in the background

→ CONTINUED ON p6



5



6

**Figure 5**  
Bull showing true  
breed colour

**Figure 6**  
A pair of Chillingham  
Wild White calves

### Population dynamics

Herd records from 1862 to 1899 have been compared with those from 1953 to 1984, and showed no diminution of fertility. The following numbers of calves were born per female (all ages grouped) per year: 1862-1899, 0.31; 1953-1984, 0.38; and 1985-2004, 0.29.

### Reserve herd

The reserve herd was established in late 1970 on a small partly wooded permanent pasture adjacent to a commercial beef and arable farm in northeast Scotland, as a source of replacements should catastrophe overtake the main herd. Two yearling heifers and a yearling bull comprised the first introduction. Five further translocations were made, totalling ten females and three males. The two most recent were in 1997 and 2005 when the animals were captured using etorphine delivered by dart gun and taken by lorry to the reserve herd. Since 1970, 50 calves have been born in the reserve herd which currently (March 2005) comprises three bulls (born 1999, 2002 and 2004), seven parous

cows and six heifers, born 2002-2004. Aged or infertile animals are culled.

### Cryoconservation: a semen and embryo archive

In March 2002 semen was collected and frozen from two bulls, then aged two and three years, in the reserve herd. The Scottish Executive Environment and Rural Affairs Department (SEERAD) and Defra agreed that the cattle were not covered by the Artificial Insemination of Cattle (Animal Health)(Scotland) Regulations 1985 or the Artificial Insemination of Cattle (Animal Health)(England and Wales) Regulations 1985 (as amended). As the animals had not been handled, permission was sought (and granted) to collect the semen by electro-ejaculation, under sedation (xylazine, delivered by dart gun) and anaesthesia.

Three collections were taken from each bull (range of volumes 4 to 15 ml) but concentration and motility were low. 29 and 24 straws respectively were obtained from the two bulls. The quality was thought too low for conventional artificial insemination but probably adequate for in

vitro fertilisation.

Blood samples and sheath washings were screened for bovine viral diarrhoea (BVD), Johne's disease, Q fever, brucella, enzootic bovine leukosis (EBL) and *Campylobacter fetus* and both bulls were negative on all counts.

In 2003 an attempt was made to collect embryos after superovulation followed by natural service. A bull and four cows were darted with etorphine; two cows were found to be pregnant (and subsequently delivered live calves). The non-pregnant cows were separated from the herd, superovulated, and served naturally; this was followed by embryo flushing. Unfortunately no embryos were recovered and the two cows exhibited a total of only three corpora lutea. It is planned to repeat the attempt, possibly including temporary housing for the cattle and a revised superovulation protocol.

## Biosecurity

### Foot and mouth disease

During the foot and mouth outbreak of 2001 CWCA, with generous support from its then landlords, College Valley Estates, took special precautions to safeguard the herd including securing the removal of the sheep from the park to alternative grazing elsewhere, the commissioning of consultants to produce a biosecurity plan with a contingency plan for the salvage of genetic material from the herd should it be slaughtered, and the lobbying of Defra officials and politicians to ensure that the conservation and historical significance of the herd was properly recognised. The Chillingham herd was cited as one of the special herds that should qualify for special consideration in this situation (Brownlie,

2001). The nearest confirmed outbreak occurred 10 km from Chillingham, on 26 April. On the same day, the policy of culling animals on farms contiguous to outbreaks was refined. The government retains a slaughter and compensation policy as the means of eradication; however, under a new EU Directive vaccination would be an option in the event of a future outbreak. CWCA would

only support vaccination if there were no alternative; it has concerns over how these highly homozygous animals would respond to a vaccine, and over the practicalities of handling the animals without causing deaths.

The Animal Health Act, which became law in England and Wales in January 2002, provides the power to slaughter in such emergencies. The Parliamentary Under-Secretary of State at Defra responded to CWCA concerns thus: "Although I regret I cannot pledge absolute immunity, I can assure you we all recognise the importance of the herd and the way you have implemented good biosecurity. I am quite sure they will be safe in all but the most unlikely and extreme circumstances, and even then we would always explore all other options other than culling" (E. Morley MP, personal communication, 25 November 2001).

### Other notifiable and non-notifiable diseases

No evidence of notifiable disease has been identified in the herd, clinically or at autopsy. The herd has never been tuberculin tested. The absence of evidence of tuberculosis, the isolation of the herd, the fact that the cattle do not enter the food chain, the likelihood that

Blood samples and sheath washings were screened for bovine viral diarrhoea (BVD), Johne's disease, Q fever, brucella, enzootic bovine leukosis (EBL) and *Campylobacter fetus* and both bulls were negative on all counts.

→ CONTINUED ON p8

confining the herd for testing might provoke panic and possibly lead to the deaths of young animals, all argue against any imposition of a testing regime.

It is possible that the extreme homozygosity of the herd, which is observed throughout the genome including in the region of the major histocompatibility complex (Visscher *et al.*, 2001) means that these cattle might be highly vulnerable to disease. The highest possible standard of biosecurity must be maintained and this is a priority element in the current appeal for funds.

### Autopsies

Since 1950, a total of 64 Chillingham cattle (about 14% of the animals born into the herd) have undergone post-mortem examination, ranging from full post-mortem including worm counts, culture and histology (conducted at veterinary investigation centres on entire carcasses), to field autopsy with laboratory examination of samples.

Since 1980 only one lactating cow has died (no cause revealed at autopsy).

Diseases that have been investigated since 1950 include the following:

### Endoparasites

Total worm counts have been conducted on 15 animals most recently in 1983. The highest counts were of 8,300 *Ostertagia* and trichostrongyles and 8,000 *Cooperia* in a yearling in March 1983. Several zero counts were obtained. Samples of faecal material and herbage in 1949, 1950 and 1977 did not indicate any significant parasite challenge. However, ostertagiasis was implicated in the deaths of the three yearlings transferred from Chillingham to the reserve herd in 1977. Fascioliasis was recorded at autopsy in 1963 and in 2005. In 1971 an assessment of the nematode fauna of the Chillingham herd found it to be similar to that of husbanded cattle. The cattle often show signs of scouring, but evidence of parasites has not been found

at post-mortem, nor in a systematic survey of faeces and herbage in 1978.

### Ectoparasites

The louse *Haematopinus eurysternus* was reported in 1977 but louse infestation has not been obvious.

### Hypomagnesaemia

This was diagnosed as the cause of death of six lactating cows in early 1980, but has not been identified before or since.

### Dystocia

From 1945 to February 2005 a total of 450 calves were born. During this period, eight cows or heifers died during calving: thus 1.8% of calvings have resulted in the death of the dam. A further nine calves were reported as stillborn. One incidence of twinning has been observed (in the reserve herd; one was born dead, the other died after 3 weeks).

### Trauma

Between 1945 and 2005, eleven bulls and three females were recorded as having died as a result of injuries caused by other members of the herd, either physical assault or fighting.

### Skeletal and dental defects

Most individual Chillingham cattle exhibit dental anomalies, the most frequent being congenital absence of one or more cheek teeth. A calf was born without a tail in 1999 and humpbacked animals have been born both at Chillingham and in the reserve herd.

### Ocular disease

Infectious bovine keratoconjunctivitis (New Forest disease) was widespread in the Chillingham herd in the late 1970s (K.C. Barnett, personal communication). Also, in early 1979, of 11 bulls examined during hay feeding seven had corneal opacities in one or both eyes, the largest approximately 2 cm<sup>2</sup> in area (average 0.9 cm<sup>2</sup>). Of 16 cows and heifers examined, 7

exhibited the condition (average 0.6 cm<sup>2</sup>). Such corneal opacity is commonly associated with trauma and secondary bacterial infection.

### Testicular hypoplasia

Chillingham bulls reach puberty at 18-20 months of age. Even when full grown they have small testes (a bull of approximately 330 kg had a combined testicular weight of 167 g, about half what would be expected from studies in commercial breeds). Testicular hypoplasia manifests itself in yearling bulls (R.R. Ashdown, personal communication).

### Bacterial diseases

Attempts to isolate bacterial pathogens were made with specimens from 14 animals in the period 1979-1983, from a six year old bull in 2005, and on several occasions

previously. The causative organism of Johne's disease was isolated in 2005, the first time clinical signs of bacterial disease have been observed at autopsy, except for one observation (in 1963) of "histological evidence of mild Johne's disease". Bovine tuberculosis has not been observed.

**The Convention on Biodiversity (CBD) entered into force in 1993. The CBD applies to farm animal and crop plant biodiversity.**

### Neoplasias

Few neoplasms have been identified. An intraocular melanoma with secondaries to the liver was recorded in February 2002.

### Compliance with legal requirements

Interpretation of the law as it affects the Chillingham cattle would ultimately be the responsibility of the courts, and CWCA as a charity of limited resources cannot afford counsel's opinion on these matters. If challenged its arguments would include the observations that the cattle have been living in these conditions for several hundred years without jeopardising other

livestock, and that handling the herd could prejudice its survival.

### Convention on Biodiversity

The Convention on Biodiversity (CBD) entered into force in 1993. Its text can be found at <http://www.biodiv.org/doc/legal/cbd-en.pdf>. The CBD applies to farm animal and crop plant biodiversity. Though many of the obligations of the CBD are conditioned by phrases such as "as far as possible" and "as appropriate", as a Contracting Party, the UK Government agrees to "regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas with a view to ensuring their conservation and sustainable use (Article 8); "adopt measures relating to the use of biological resources to avoid or minimise adverse

impacts on biological diversity" and "protect and encourage customary use of biological resources in accordance with traditional cultural practices that are

compatible with conservation and sustainable use requirements" (Article 10). There is a clear obligation on the UK Government not to jeopardise the survival of the Chillingham cattle.

### Cattle herd registration

The Cattle (Identification of Older Animals) Regulations 2000 put into effect Article 4.1 of Council Regulation (EC) 820/97. These Regulations require all bovine animals on a holding born after 1 January 1998 to be eartagged. The Chillingham herd is not eartagged, because CWCA has been advised by Defra (1) that the Preamble to this Regulation indicates that the latter was framed with reference to animals involved with the food chain and (2) that if the

→ CONTINUED ON p10

Regulation had been intended to apply to cattle such as these, then the phrase “whether or not” would have been placed before the phrase “on a holding”.

### Disposal of carcasses

It has been confirmed by the local Animal Health Office and Trading Standards Department (February 2005) that the cattle are regarded as wild animals and are thus not subject to the current EU Animal By-Products Regulations prohibiting burial of carcasses of domestic livestock. In the past carcasses have either been buried in the Park or removed to local hunt kennels. Bones from Chillingham cattle are kept in many collections, most notably the British Museum (Natural History).

### Dangerous Wild Animals Act

Since the cattle are not of a scheduled species, this Act is not seen as applying to the Chillingham herd.

### Zoo Licensing Act 1981

In 1985 a dispensation was granted that this Act does not apply to Chillingham Park.

### Welfare legislation

The main challenges to welfare arise from calving difficulties and from the abandonment of calves by their dams. Between 1977 and 2005 there have been two malpresentations of calves which resulted in the death of the dam. On the latter occasion, and on three occasions that cattle have been badly injured in fights, the animals were shot with a rifle. Autumn and winter-born calves may be abandoned by their dams, but because cows give birth in isolation and calves can be difficult to locate, it is not always obvious that a calf has been abandoned. Two of the translocations from Chillingham to the reserve herd were of abandoned calves.

In all other respects the welfare of the Chillingham cattle appears to conform to the requirements of the relevant welfare code (Defra, 2003).

### Wildlife and Countryside Act

The Chillingham cattle are, in strict biological terms, feral domesticates but might fit with the definition of wild animals in this Act as “those that are living wild”. However, none of the provisions of the Act appear to have relevance to the Chillingham herd.

### Conclusions

The Chillingham cattle have benefited from the sympathetic and constructive attitude of many generations of veterinary surgeons and Government officials who have always accepted the special place that the herd has in our national heritage. The CWCA is anxious to maintain these benign relationships, which are of critical importance to the continued survival of the herd.

**Figure 7**  
The Chillingham Wild Whites – a herd with a special place in our national heritage.



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## INFORMATION

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March 2005

# Med-Vet-Net: Integrating Research on Zoonoses

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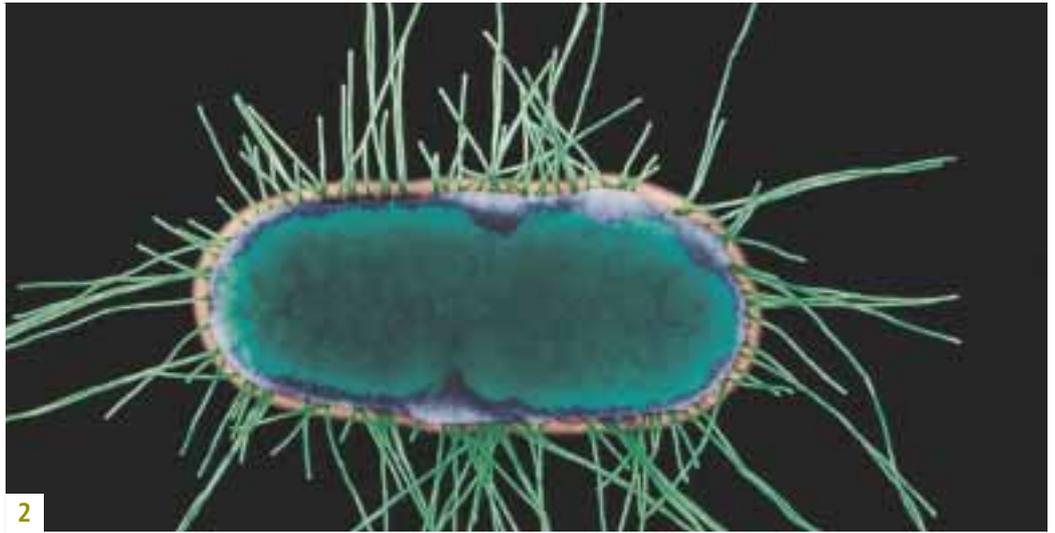
Readers should note that this paper is written from a research perspective. High quality research such as this paper describes is needed to enable the best decision making by groups such as the Food Standards Agency (FSA) in the UK and the European Food Safety Authority (EFSA) in Europe as a whole. In this respect increased awareness at National and EU level has been assisted by cross-Government collaboration such as the UK Zoonoses Group and the Health Protection Agency (HPA) Human Animal Infections and Risk Surveillance (HAIRS) group which join up policy on zoonotic threat management. A result of greater awareness of food-borne zoonoses has been that significant regulatory changes which are designed to enhance safety of food-chain products have occurred. These include the imminent EU Food Hygiene Regulations and the new Zoonoses Directive.

**European research scientists have established a new network, called Med-Vet-Net, to integrate research on the prevention and control of zoonotic diseases**

## Introduction

Of the 1,415 microbes known to cause infectious disease in humans, over 60 per cent are transmissible from animals. Many of these infections occur by the consumption of contaminated food products or from contact with food-producing animals. This association was formally recognised in 1855 by German pathologist Rudolf Virchow, while he was investigating the nature of trichinellosis in humans (which is caused by the nematode parasite *Trichinella spiralis* and mostly occurs through the consumption of pig meat containing encysted worms). Virchow introduced the term 'zoonosis' which means 'infections due to contagious animal poisons', founding the discipline of comparative medicine and bringing together the common public health goals of human and veterinary medicine for the first time.

Over the last 150 years or so, the success in understanding the animal sources and transmission routes for zoonotic diseases and the formulation and implementation of strategies for their prevention and control has been chequered. On the one hand for example, strategies for brucellosis and trichinellosis eradication by detection in the live animal or at slaughter in the United Kingdom have clearly been successful. However, control methods for diseases such as bovine tuberculosis have been less effective. Pasteurisation of milk, supported by the testing and slaughter of infected animals, significantly reduced the



incidence of human tuberculosis caused by *Mycobacterium bovis*. However, the recent resurgence of bovine tuberculosis, for reasons as yet unclear, has reminded us that the status of zoonotic diseases can quickly change and control strategies will be under constant challenge.

### Emerging zoonotic diseases

Zoonoses are often responsible for emerging or re-emerging diseases in humans. In many cases, the incidence of zoonotic diseases in humans has increased due to introduction into a new host population or as a result of long-term changes in the underlying epidemiology in an existing host population. It has recently been estimated that over 75% of emerging diseases are zoonotic. In the last few years, such diseases have caused world-wide human epidemics when transmitted through the food chain. For example, it is thought that HIV was originally transmitted from primates such as chimpanzees, which were used as bush meat. Severe Acute Respiratory Syndrome (SARS) is also thought to have been acquired through the trade in wild animals, including civet cats, as food. Even more recently, the zoonotic potential of avian influenza has been highlighted in south-east Asia where 32 of 45 known

infected humans have died. The potential for the development of human to human transmission has raised media-fuelled fears of a future flu pandemic.

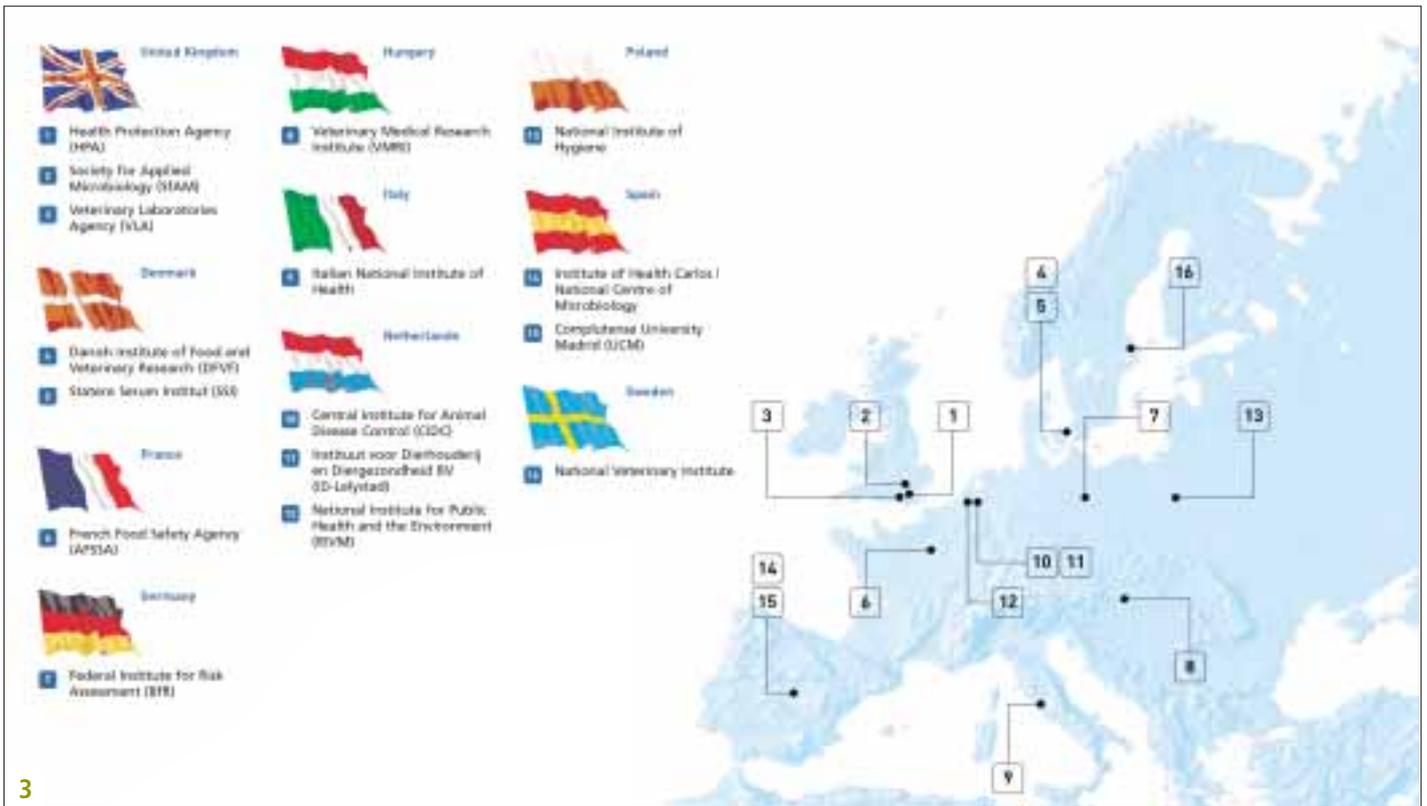
Zoonotic diseases have always represented a risk to humans but recent events have demonstrated that these risks can change as a result of:

- global travel and international livestock trade;
- increasing encroachment of man and livestock into previously uninhabited regions;
- increasing contact between man and exotic animals as pets;
- changes in livestock production including intensification;
- shifts in human eating and food preparation habits;
- mutations in infectious agents resulting in increased virulence;
- development of new transmission routes such as dengue fever carried by mosquitoes breeding in old tyre dumps, and;
- increasingly older and more susceptible human populations, including an increase in immunosuppressed patients with HIV infections or undergoing immunosuppressive therapy.

**Figure 1**  
Rudolf Virchow

**Figure 2**  
Escherichia coli

→ CONTINUED ON p14



**Figure 3**  
Partner institutes of Med-Vet-Net

Fuelled by media attention, the public awareness of food safety has been significantly enhanced. The general public is now familiar with the consequences of *Salmonella* in eggs, *Escherichia coli* O157 in hamburgers, *Campylobacter* in poultry meat, *Cryptosporidium* in water or bovine spongiform encephalopathy (BSE) in cattle and consumer responses to such scares has had a significant impact on both statutory regulations and the food industry.

**Research integration needed**

In 2002, the European Commission identified zoonotic diseases as an important research requirement. In the past, research on zoonotic diseases in Europe has been notoriously fragmented with a major division between researchers in human and veterinary medicine. This separation has been emphasised by separate education, training, research institutes and funding. To some extent, this division is also enhanced by the lack of joint ownership of public health problems related to zoonoses. For example, some microbes that cause disease in humans,

like *Campylobacter jejuni* or *Escherichia coli* O157, have few or no obvious clinical consequences in the animal host and therefore control strategies are of little veterinary or industry benefit.

Fragmentation also occurs within the medical and veterinary sectors with lack of collaboration, and even sometimes competition, between different scientific disciplines, sectors in food production, and groups of workers studying different aspects of the same disease agents. Clearly, we now need research integration to bridge the knowledge gaps. Moreover, because the world has become a global village, this collaboration must be increasingly international. All these issues generate a unique challenge for sharing scientific knowledge and building cross-disciplinary teams with common goals.

**A European network for Zoonoses Research**

To meet this challenge the European Union (EU) 6th Framework Programme, within the 'Quality and Safety of Food' Priority Area, has provided financial

support to develop a Network of Excellence for the Integrated Research on the Prevention and Control of Zoonoses called Med-Vet-Net. This network comprises 16 European partners and over 300 scientists, and aims to integrate veterinary, medical and food science research, and to allow scientists to share and enhance their knowledge and skills, as well as develop collaborative research projects. Med-Vet-Net officially commenced on 1 September 2004, and is funded for five years at a cost of €14.4 million (£10 million).

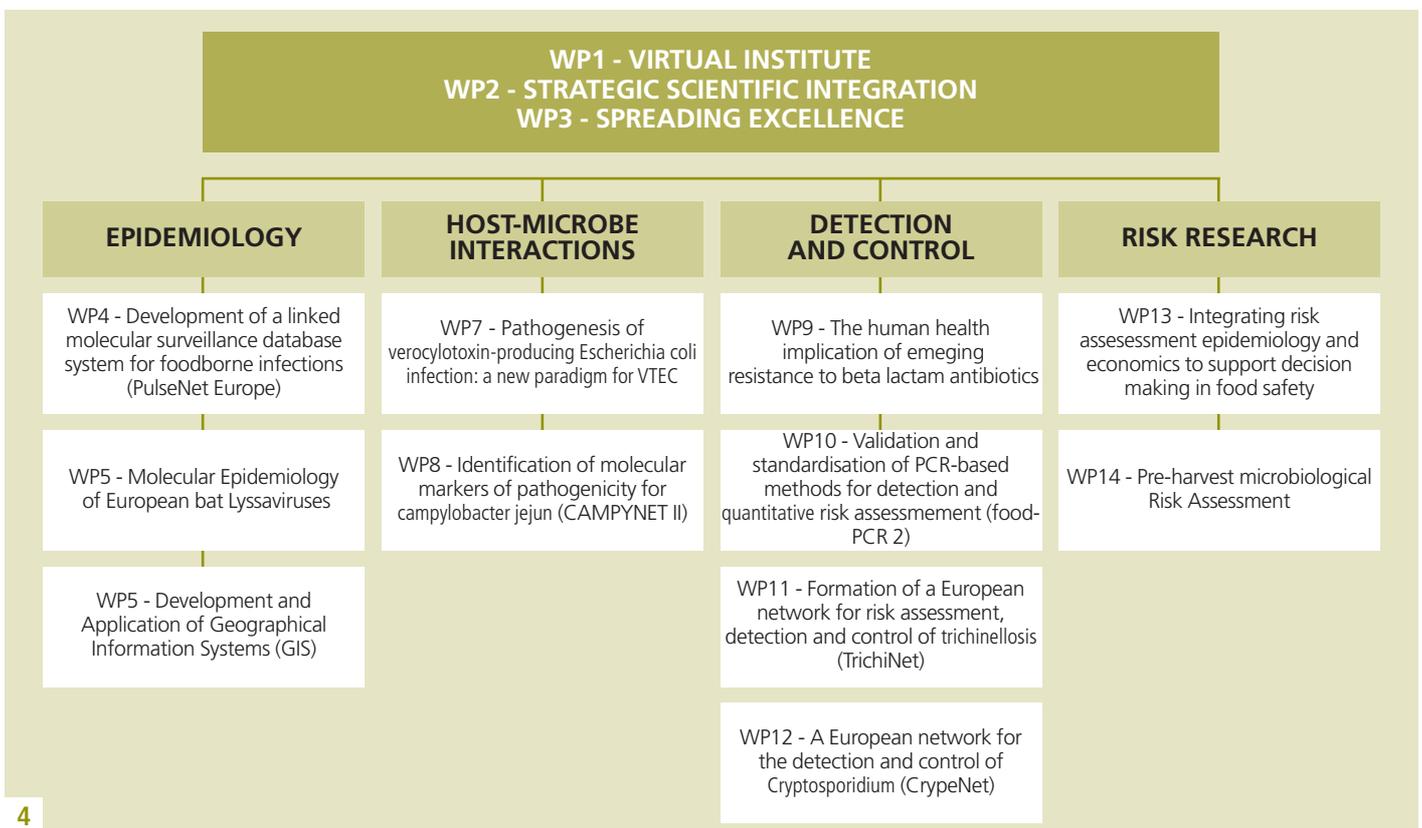
The research challenges that Med-Vet-Net face are many and complex. In order to control zoonotic diseases across the 25 member states of the EU, it is necessary to detect and identify the human disease, understand the transmission routes and the critical control points, and introduce effective intervention. This all has to be done within widely diverse agricultural and public health environments.

Additionally, existing disease agents are constantly changing and new disease

agents are emerging, so this approach must become sustainable for the future to ensure new risks are appropriately identified and responded to.

The first task of the Network is to prioritize the diseases that need to be investigated from the 1,415 known zoonotic pathogens. This process is complicated by the concerns of individual member states. In November 2003, the EU defined Lists A and B of the Directive 2003/99/EC which specify those zoonotic agents and diseases considered relevant to the EU (see Table 1). List A sets out zoonoses which must be included in monitoring. List B defines viral, bacterial and parasitic zoonoses and zoonotic agents that are to be monitored according to the epidemiological situation. Some of the List B diseases, like tuberculosis, brucellosis and TSEs already have dedicated European networks in place. Other European networks also exist, such as one researching *Salmonella* vaccines or COST Action 920 (An EU-Funded Project on Foodborne Zoonoses: a Co-ordinated

**Figure 4**  
Scientific activities are currently focussed on four themes; Epidemiology, Host-Microbe Interactions, Detection and Control and Risk Research



List A) Zoonoses and zoonotic agents to be included in monitoring	List B) List of zoonoses and zoonotic agents to be monitored according to the epidemiological situation
<ul style="list-style-type: none"> <li>• Brucellosis and agents thereof</li> <li>• Campylobacteriosis and agents thereof</li> <li>• Echinococcosis and agents thereof</li> <li>• Listeriosis and agents thereof</li> <li>• Salmonellosis and agents thereof</li> <li>• Trichinellosis and agents thereof</li> <li>• Tuberculosis due to Mycobacterium bovis</li> <li>• Verotoxigenic Escherichia coli</li> </ul>	<p><b>Viral Zoonoses</b></p> <ul style="list-style-type: none"> <li>• Calicivirus</li> <li>• Hepatitis A virus</li> <li>• Influenza virus</li> <li>• Rabies</li> <li>• Viruses transmitted by arthropods</li> <li>• Other viral zoonoses</li> </ul> <p><b>Bacterial zoonoses</b></p> <ul style="list-style-type: none"> <li>• Borreliosis and agents thereof</li> <li>• Botulism and agents thereof</li> <li>• Leptospirosis and agents thereof</li> <li>• Psittacosis and agents thereof</li> <li>• Tuberculosis other than in List A</li> <li>• Vibriosis and agents thereof</li> <li>• Yersiniosis and agents thereof</li> <li>• Other bacterial zoonoses and zoonotic agents</li> <li>• Parasitic zoonoses, anisakiasis and agents thereof</li> <li>• Cryptosporidiosis and agents thereof</li> <li>• Cysticercosis and agents thereof</li> <li>• Toxoplasmosis and agents thereof</li> <li>• Other zoonoses and zoonotic agents</li> </ul> <p><b>Other parasitic zoonoses and zoonotic agents</b></p>

**Table 1**  
EU defined Lists A and B of the Directive 2003/99/EC which specify those zoonotic agents and diseases considered relevant to the EC

Approach) which communicates on foodborne disease surveillance. Med-Vet-Net will not compete, but will actively collaborate, with these other networks

**A new way of working**

The Network is administered as a 'Virtual Institute' by the French Food Safety Agency (AFSSA). This virtual institute undertakes the administrative and financial procedures to enable the effective running of the Network.

All partner institutes are represented in two management groups (Governing Board and Co-ordinating Forum).

Strategic scientific integration is central to the project and is co-ordinated by the Project Manager, Professor Diane Newell at the Veterinary Laboratories Agency (VLA) at Weybridge. This integration is essential for the development and implementation of a strategic scientific research plan, training and continuous personal development, cataloguing skills, expertise and facilities and

extending the network activities. Scientific activities are currently focussed on four themes: Epidemiology, Host-Microbe Interactions, Detection & Control, Risk Research. In the first 18 months of the network, 11 scientific workpackages have been commissioned (see Figure 4).

Also central to the network is the dissemination of knowledge both between the scientists within the Network as well as externally to the public, media and policy makers. This is the responsibility of the Society for Applied Microbiology (SfAM), who have formed a Communications Unit. This Unit's role is to develop an internal website for scientists to share news, achievements, and reports; an external website with information for the public and other stakeholders ([www.medvetnet.org](http://www.medvetnet.org)); a monthly newsletter; fact sheets on zoonoses; and stories on the network's research. Strategies for advising our various stakeholders (politicians, media journalists, consumers, general public) about Med-Vet-Net will also be developed, and a training and development program for 'Scientific Communicators' within each institute will be established.

### Looking forward

Med-Vet-Net will consider all human, veterinary and food aspects of zoonotic diseases. To achieve this, collaborative expertise is available from doctors and medical scientists who identify human diseases, epidemiologists and risk analysts who establish links with animals, microbiologists who confirm those links and veterinary and food scientists responsible for the control and prevention of the risks. Such a multi-disciplinary approach will enable knowledge to be shared across regional, national and international borders. Med-Vet-Net is already extending beyond Europe. Active collaboration has been established with a similar research network in Australia (AB-CRC) and further European funding has been awarded to support collaboration with the new food safety research network of CREES (Co-operative

State Research, Education and Extension Service) and the USDA (United States Department of Agriculture) in the USA. The future challenge will be to draw together all this research expertise into a global network to be linked together by the common goal of sharing knowledge to ensure human public health worldwide.

**Further information is available at [www.medvetnet.org](http://www.medvetnet.org)**

*Pictures are courtesy of the National Library of Medicine.*

#### INFORMATION

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March 2005

# The Control of Sheep Scab and Bovine Tuberculosis in the Dartmoor National Park

## AUTHORS

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## Introduction

The Dartmoor National Park comprises (i) the large areas of unenclosed common land which support semi-natural, upland vegetation (moorland) grazed by populations of cattle, sheep and ponies; (ii) the surrounding farmland, to which grazing rights on common land are attached; and (iii) smaller areas of woodland habitat which provide shelter and browse for ponies. Sheep, cattle and ponies in flocks and herds with traditional common grazing rights are

Brucellosis, warble fly and, most recently, foot and mouth disease, are notifiable diseases which have been eradicated from the cattle and sheep populations in the Dartmoor National Park.

moved between the common land and farmland in the National Park for husbandry purposes.

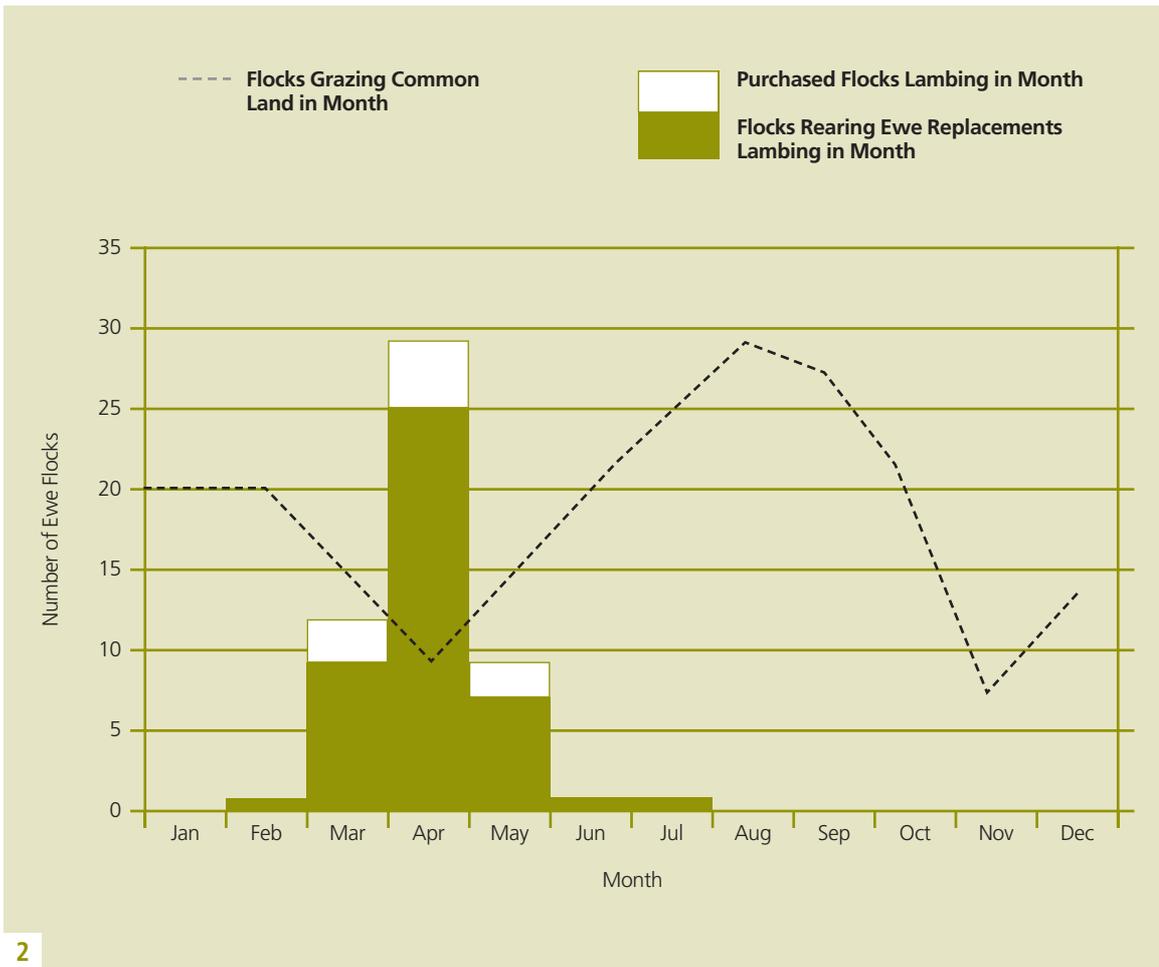
The farming community on Dartmoor has long experience of co-operation with the State Veterinary Service (SVS) on the differential diagnosis and control of notifiable disease in farm animals. Brucellosis, warble fly and, most recently, foot and mouth disease, are notifiable diseases which have

been eradicated from the cattle and sheep populations in the Dartmoor National Park. However, bovine tuberculosis (TB), which occurs in cattle and badgers, is a notifiable disease which has not been eradicated, and sheep scab has been re-introduced following the failure of eradication policies elsewhere.

The Dartmoor Commons Act 1985 established the Dartmoor Commoners' Council (DCC) to regulate common grazing rights in the Dartmoor National Park. Regulations under the Act give the Council powers to register flock and herd marks and to regulate the movements of animals between farmland and common grazing (Dartmoor Commoners' Council 1990). The Regulations prohibit the movement onto common grazing of animals known to be, or suspected of being, affected by a notifiable disease, and give the Council powers to enforce the removal of animals from common



**Figure 1**  
Dartmoor  
Commoners' Council  
- notice of a  
clearance of sheep  
from common  
grazing



**Figure 2**  
Dartmoor National Park - the season of lambing and use of common grazing by ewe flocks (Lewis 1993)

2

land for the control of notifiable disease or other infection, or because they are unfit. This paper reviews (i) established strategies for monitoring of sheep scab and surveillance of bovine TB in the Dartmoor National Park, and (ii) co-operation between the SVS and DCC on strategies for the control and prevention of new outbreaks of sheep scab and herd TB breakdowns.

**Monitoring and control of sheep scab in the Dartmoor National Park**

The eradication of sheep scab from Dartmoor was achieved prior to the Dartmoor Commons Act 1985 by the synchronisation and supervision of

dipping of all flocks within the Dartmoor National Park with an approved acaricide.

Compulsory dipping has since been discontinued, but the annual synchronised clearance of all sheep off Dartmoor's common grazing onto farmland has continued to be supported by Dartmoor commoners, even in years when no sheep scab has been reported. The purpose of this clearance has been to promote good husbandry and stockmanship, including the monitoring of all gathered sheep for sheep scab before ewe flocks are returned to common grazing in winter. Most flocks with common grazing rights on Dartmoor

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**Figure 3**  
Sheep grazing;  
settlement and areas  
of woodland in the  
distance

**Figure 4**  
Pony grazing in  
bracken

**Figure 5**  
Cattle also graze  
within the National  
Park

lamb in April (Figure 1), and the agreed period for compulsory clearance of sheep from the common grazing is in November (Lewis 1993), the month when rams are put into ewe flocks.

Posting of a notice setting out the dates on which all sheep must have been removed from common grazing, and the enforcement of the clearance, are responsibilities of the Dartmoor Commoners' Council (Figure 2). These dates are agreed almost 12 months ahead, and at least 6 weeks formal notice is given.

### The diagnosis and control of new outbreaks of sheep scab in flocks with common grazing rights.

Since the DCC regulations were approved (Dartmoor Commoners' Council 1990), there have been a series of outbreaks of sheep scab affecting both flocks resident on farmland and flocks with common grazing rights in the Dartmoor National Park. The authors have co-operated on the notification and differential diagnosis of sheep scab, and in monitoring animal welfare, in flocks with common grazing rights. In some cases sheep scab has been reported as an animal welfare problem. The diagnosis of sheep scab has been confirmed from typical clinical signs and the presence of live mites on affected sheep.

In all the outbreaks investigated by the authors the disease has been notified and diagnosed in sheep on farmland where

affected flocks had been gathered for monitoring and treatment. The disease has been clinically severe and has presented a risk to the welfare of affected flocks. Treatment of affected flocks has been the responsibility of the farmer and his veterinary surgeon. Veterinary certification that approved treatment of an affected flock has been carried out is required by the DCC before the flock can be returned to common grazing.

### The role of the Animal Welfare Officer (AWO)

The AWO is responsible for reporting all confirmed cases of sheep scab in flocks with common grazing rights to the DCC, and for advising the Council on a strategy for the control of sheep scab on common grazing.

The parameters which are important for the control of sheep scab by the clearance of sheep from common grazing land are set out in the Sheep Scab Order 1997. These are (i) the length of time required to protect the sheep against re-infection by mites remaining on the common grazing, a period of up to 16 days, and (ii) the duration of residual protection against sheep scab afforded by flock treatment.

The strategy supported by the DCC for the control and prevention of sheep scab by an annual clearance of sheep from common grazing in November has taken account of the residual protection after

The diagnosis of sheep scab has been confirmed from typical clinical signs and the presence of live mites on affected sheep.



**Figure 6**  
Rams undergoing sheep dipping with approved acaricide

**Figure 7**  
Sheep with wool loss due to Sheep Scab.

treatment conferred by products licensed for the treatment of the disease.

In an area the size of the Dartmoor National Park, differences between flocks in separate ownership in their lambing dates and their use of common grazing (Figure 2) limits the scope for agreement on a long clearance period applicable to all the common grazing. However, since 1985 the Dartmoor Commoners' Council has supported a progressive extension of the duration of the annual sheep clearance period in November from two to 16 days (Figure 1). The longer clearance period makes it possible for farmers and their veterinary advisers to synchronise the monitoring and treatment and/or prevention of sheep scab in all flocks, in order to ensure that breeding flocks returned to common grazing for the winter are free from sheep scab and protected against mites which may have survived in the environment; or, in the case of a clearance lasting 16 days (Figure 1), that no mites have survived in the environment.

There have been only three instances to date in which the DCC has had to enforce farmer compliance with the clearance of sheep from common land in November, demonstrating that the strategy has received the essential support of the farming community.

### Surveillance and control of Bovine Tuberculosis in the Dartmoor National Park

Under national strategies for surveillance and control of bovine tuberculosis regular tuberculin testing has been applied to all

herds in the Dartmoor National Park. The same frequency of herd testing applies to all herds in a parish; in the National Park this will include both herds resident on farmland and those with common grazing rights. In those parishes where there is evidence of TB the whole herd is tested annually. Herds with common grazing rights must be gathered onto farmland for tuberculin testing, and the DCC Regulations include powers to enforce this where TB, or other notifiable disease, is suspected.

Bovine TB was the only notifiable disease endemic in the National Park when the DCC Regulations were drafted; at this time annual whole herd testing applied in seven of the 34 parishes in the Park.

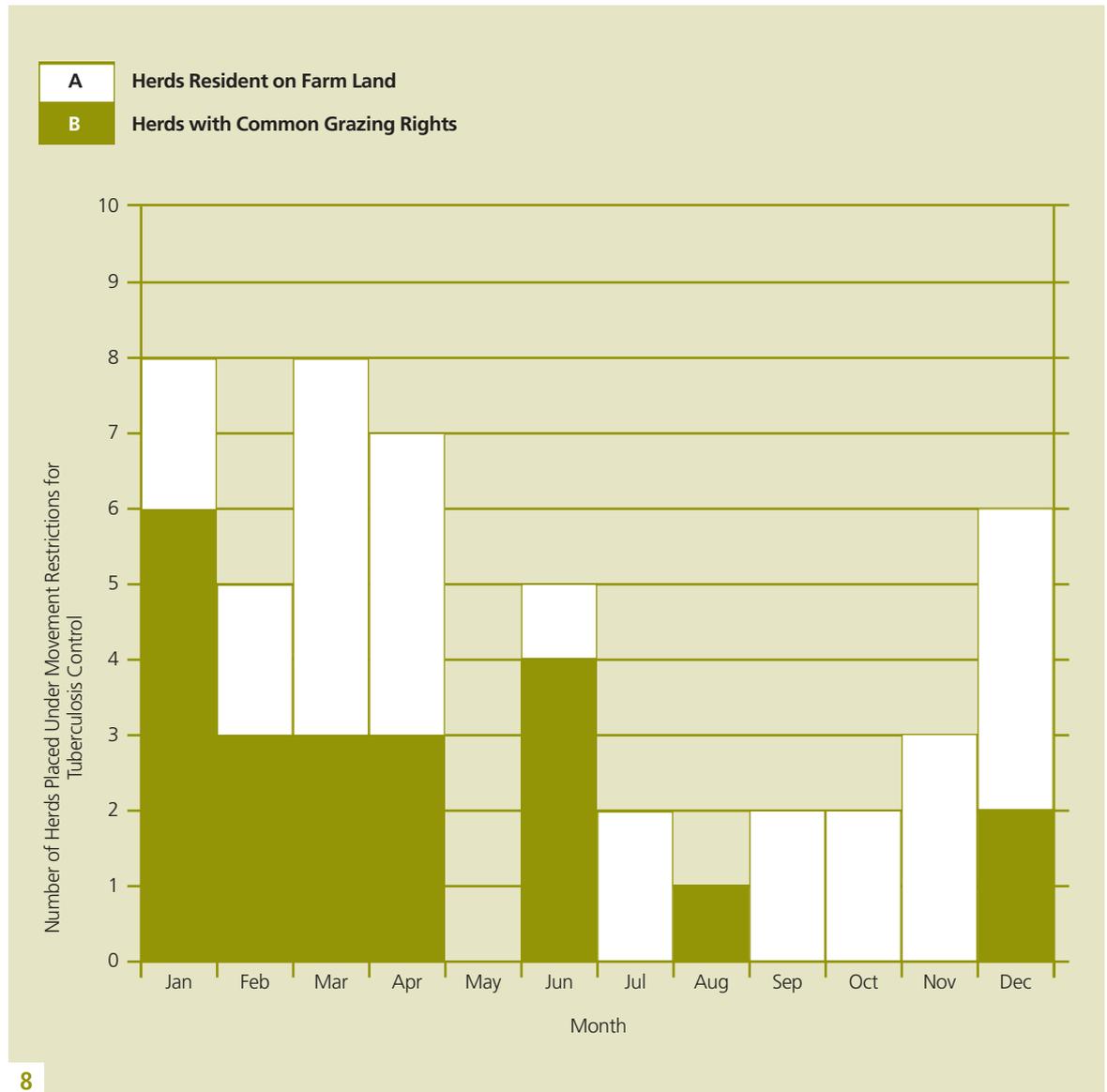
### The origin of new tuberculosis herd breakdowns in the Dartmoor National Park

It was necessary from the outset to differentiate between new TB herd breakdowns in herds resident on farmland, and those in herds with common grazing rights. Figure 8 shows new TB herd breakdowns in the Dartmoor National Park between 1988 and 1991. Overall, 44% of new breakdowns occurred in herds with common grazing rights. The affected herds were placed under movement restrictions and tested under national procedures, with removal of reactors, until deemed to be free of the disease.

Good stockmanship, biosecurity and

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**Figure 8**  
The incidence of new tuberculosis herd breakdowns in the Dartmoor National Park, 1988 – 1991.



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animal welfare are essential for the surveillance and control of bovine TB in cattle, whether on agricultural holdings or on common grazing (MAFF 2000, Defra 2001). For example, official methods of individual animal identification are necessary for disease surveillance by tuberculin testing. Dartmoor commoners typically own and manage herds of both types, and some useful comparisons can be made between the two husbandry systems in the National Park.

(i) **Stockmanship** – herds with common grazing rights are composed of suckler cows of hardy breeds and their crosses, which rear female replacements on common grazing and farmland within the National Park (Lewis 1993); rearing replacements is important for disease prevention, eg reducing susceptibility to tick-borne disease (Vaughan 1988) and minimizing the risk of introducing TB-infected animals from outside the parish. Herds grazing common land are moved to farmland for supplementary feeding in winter, and for tuberculin testing;

because the same cattle handling facilities are used as for herds resident on farmland, adequate notice of test dates is necessary so that contact between herds is avoided.

(ii) **Herd biosecurity** – within the National Park, DCC Regulations which apply to the control of all notifiable diseases prohibit the movement of animals affected or suspected of being affected by TB onto common grazing. These animals must be isolated on the farm of origin.

(iii) **Animal welfare** – the peak month of calving for suckler herds which rear replacements is in May (Lewis 1993). Whole herd tuberculin testing is avoided on welfare grounds in herds close to calving, and the number of new herd TB breakdowns diagnosed in May is consequently reduced below the seasonal trend (Figure 8). Animal welfare is one of the reasons why it is important that routine whole herd tuberculin tests are not delayed.

Since 1991, annual or bi-annual herd tuberculin testing has been extended to all parishes in the Dartmoor National Park.

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### INFORMATION

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March 2005

# Anthelmintic Resistance in Gastro-Intestinal Parasites of Sheep in the United Kingdom

## AUTHOR

Sian Mitchell

## Introduction

Sheep production in the UK has been influenced by the availability of a large number of safe, extremely efficient anthelmintic drugs developed through the 1960s and 1970s. During this time thiabendazole (the first of the benzimidazoles) and levamisole anthelmintics were discovered. Each has a different mode of action and both are broad spectrum in the parasites they kill. In the late 1970s ivermectin was launched (the first of the macrocyclic lactone (ML) group). The MLs are active in very small quantities and also have action against ectoparasites. Therefore sheep management systems developed that relied heavily on anthelmintic use, with suppression of parasites and this led, in turn, to increased production benefits. There are numerous anthelmintics now available in the UK but all belong to one of the three classes of anthelmintics ie. benzimidazoles (BZs), levamisole/morantel or MLs.

## Changes in UK agriculture

Concomitant with this were changes in agriculture. Driven by subsidy changes, the UK saw an increase in the numbers of sheep, (34,985,000 in 1984, increasing to a peak of 44,656,000 in 1999), a reduction in the numbers of cattle (13,331,000 in 1984 reducing to 10,517,000 in 2004) and an increase in permanent grassland, all of which reduced the

We have evidence that gastro-intestinal parasites are now able to complete their life cycles throughout the year, probably due to the warmer, wet winters.

capacity to control parasites by pasture management.

## Changes in the occurrence of helminth parasites in the UK

We have evidence that gastro-intestinal parasites are now able to complete their life cycles throughout the year, probably due to the warmer, wet winters. In recent years sheep have been shown to be ingesting infective larvae from pastures much later in the year with diagnoses of parasitic gastro-enteritis also occurring over the winter.

## General information on Anthelmintic resistance

There is a lot that is not fully understood about anthelmintic resistance. It is thought, however, that naturally resistant parasites were present in low numbers in parasite populations, before the advent of anthelmintics. The use of anthelmintics has given the resistant parasites an advantage over the other, non-resistant ones. The rate that resistance develops on a holding, will depend on the proportion of parasites of the total population that are present in the animal and which can be exposed to anthelmintic treatment compared to those, termed '*in refugia*', that are on the pasture, or in untreated animals. In general, the larger the proportion '*in refugia*', the slower resistance will develop.

As anthelmintics in the same class share the same mode of action, when



**Figure 1**  
*Ostertagia* spp and  
*Haemonchus*  
*contortus* from  
abomasum of sheep

resistance is present to one anthelmintic in a class, there will also be resistance to all the other anthelmintics in that class.

Incorrect use of anthelmintics is an important factor in the development of resistance as under dosing allows partially resistant parasites to survive as well as those that are resistant, so that larger numbers of parasites, which are not fully susceptible, contribute to the next generation.

No reversion to susceptibility is thought to occur in any significant way in the field. Once resistance to a class of parasites is present on a holding, it can be considered effectively permanent. Resistant parasites, if not present on a farm, can be introduced by animals from other farms, or by animals returning from grazing pastures with other animals, eg. common grazing.

### Anthelmintic Resistance in the UK

Little recent survey work has been carried out in the UK. A survey in 2000 by the Moredun Institute of approximately 100 Scottish sheep farms detected BZ resistance on 60.8% of farms tested. A similar survey which had been carried out in 1991, identified BZ resistance on 24% of farms. This would tend to indicate an increase in BZ resistance in less than 10 years. Anecdotal information from the field, and the results of work by the VLA also indicate that BZ resistance is the most common form of anthelmintic resistance in England and Wales. Initially *Haemonchus contortus* (*H.contortus*) and *Teladorsagia circumcincta* (*T.circumcincta*) were the parasites implicated and resistance was only detected in a single species on a farm. Now however, we have detected farms where more than one species is resistant

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eg. *Ostertagia* spp (includes *T. circumcincta*) and *Trichostrongylus* spp. We have also detected farms where there are parasites present which are resistant to both BZ and levamisole classes of anthelmintics. Resistance to the ML class has also been documented in the UK, and a small number of farms have been identified where triple resistance is present ie. parasites are resistant to all three classes of anthelmintics.

Further surveys on anthelmintic resistance are currently being carried out in Wales and Ireland.

### Methods of detection of anthelmintic resistance

The faecal egg count reduction test (FECRT) is the most widely used test in the field. It involves a number of lambs (ideally a minimum of ten) that are weighed, individually marked and treated with the anthelmintic under test. Faeces samples are taken at this time and the number of worm eggs is counted. The same animals are re-sampled after treatment; the interval varies with the type of anthelmintic used. (For BZs, 10-14 day interval, for levamisole 5-6 day interval and for MLs 14-16 day interval is recommended). Ideally a control group (not treated) are sampled at the same time. The average of the egg counts for each group is calculated. Resistance is confirmed if there is a reduction in group average egg counts of less than 95% and the 95% confidence level is less than 90%. This test is relatively insensitive as it only detects resistance when greater than 25% of population is resistant. It can, however, be used for all three classes of anthelmintics. If necessary the eggs detected after treatment can be developed

Anthelmintic resistance in *H. contortus* threatens the viability of sheep production in South Africa, South America, Malaysia and parts of the USA. These countries tend to have tropical climates, which results in shorter parasite life cycles and more parasite generations

to L3 stage and the species identified.

In the field, more crude assessments of anthelmintic efficacy are often used. A FECRT, without a control group could be carried out as detailed above and resistance strongly suspected if the average worm egg count is reduced by less than 95% after treatment.

In a drench check test, faecal samples are only taken after anthelmintic treatment (at the intervals described above). The absence of *Trichostrongyle*-type eggs may indicate that anthelmintic treatment has been effective. However, the lack of pre-treatment samples means that egg-producing parasites cannot be proved to be present at the time of anthelmintic treatment.

The larval development test, an *in-vitro* test used by the VLA, involves the incubation of parasite eggs with varying concentrations of anthelmintic and counting the numbers of larvae that survive and develop. This test is only able to detect resistance to the BZ and levamisole groups of anthelmintics. A minimum of 3,000 eggs is necessary for the test (10g of fresh faeces, with a minimum of 300 eggs per gram), which may be provided by supplying a combined fresh faeces sample from a number of lambs. The results show the number and species of parasites that survive the different drug classes. Other *in-vitro* tests have been used eg. the egg hatch assay, but there is no *in-vitro* test for ML resistance.

Dose and slaughter trials are the gold standard test for anthelmintic resistance, but are only used experimentally and under Home Office Licence.

### Anthelmintic resistance in sheep parasites in the rest of world

Multiple drug resistance (ie. resistance to all three classes of anthelmintics) in *H. contortus*, *T.circumcincta* and *Trichostrongylus colubriformis* have all been reported worldwide.

In South Africa, a survey in 1999 found 79% of sheep farms tested had evidence of BZ resistance, 73% had levamisole resistance and 73% ML resistance. In Australia, a survey in 2003 detected 90% of sheep farms tested had evidence of BZ resistance, 80% had levamisole resistance and 60% ML resistance.

Areas of the world where *H. contortus* is predominant tend to have higher levels of resistance and resistance was identified here earlier. Anthelmintic resistance in *H. contortus* threatens the viability of sheep production in South Africa, South America, Malaysia and parts of the USA. These countries tend to have tropical climates, which results in shorter parasite life cycles and more parasite generations. Also in these climates, the highest percentage of parasites are present in the animal, the larvae do not survive well on pasture, therefore the greatest proportion of the parasites can be selected for resistance by exposure to anthelmintic. However, New Zealand, which does not generally fit this climatic picture, also has suspicions of resistance to one or more anthelmintic classes on greater than 50% of the sheep holdings. Resistance to moxidectin (a persistent ML) has also been reported in Australia and New Zealand in small ruminants.

### SCOPS (Sustainable control of parasites in sheep)

It was because of the increasing reports of anthelmintic resistance in the UK, together with the reliance on anthelmintics on sheep farms, a Defra sponsored workshop was set up in 2003. This brought together parasitologists from the UK, Australia, Sweden and other interested parties, to try to draw up guidelines to slow the



development of resistance to anthelmintics in the UK. These recommendations are largely based on the experiences of Australia and New Zealand who are 'further down the resistance road' than the UK. At the time there was little published, UK based research on which to base specific recommendations.

These guidelines have been summarised in a technical manual for veterinary surgeons and advisors and they have also been presented in a number of meetings throughout the UK. PowerPoint presentations and summary leaflets are also available on both the National Sheep Association (NSA) and Defra websites: [www.nationalsheep.org.uk](http://www.nationalsheep.org.uk) and [www.defra.gov.uk/animalh/diseases/control/parasite\\_control.htm](http://www.defra.gov.uk/animalh/diseases/control/parasite_control.htm)

The SCOPS committee, chaired by the NSA, are now continuing the work and a similar expert workshop on ectoparasite control took place early in 2005. This workshop has looked at the problem of drug resistance in ectoparasites and the integration of ectoparasite control with the anthelmintics guidelines already published. Defra has facilitated this process and regards this as an important way of supporting the industry in this area of concern.

**Figure 2**  
Correct drenching technique is essential

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### Summary of SCOPS recommendations

(It is strongly recommended that the reader refer to the SCOPS technical manual for further information.)

1. A parasite control plan, drawn up with a veterinary surgeon or advisor, is essential. This needs to be a document that is of practical use and is regularly reviewed.
2. Store and use anthelmintics correctly. Group animals by size, ideally weighing them. Treat the heaviest in the group. Check that the equipment is correctly calibrated. Ensure that if drench is administered, it is put over the back of the tongue.
3. Quarantine treatments are important for all incoming sheep (purchased or returning from common grazing) so that resistant parasites are not brought onto the farm. In this situation you should treat with a levamisole (drench) and an ML (drench or injection) sequentially. The use of two different classes of anthelmintics minimises the risk of resistant parasites surviving. The animals should be kept off pasture for 24-48 hours and then turned onto dirty (contaminated) pasture so that any parasites surviving the treatment will be diluted by parasites already on the dirty pasture.
4. Test for anthelmintic resistance. It is essential that the farmer knows which classes of anthelmintic are effective. The parasite control plan can then take into account the results obtained.
5. Reduce dependence on anthelmintics where possible by using grazing management, alternate grazing with cattle and reduced stocking rates.
6. Avoid inadvertent anthelmintic use (eg. combined fluke and worm treatments, where only a flukicide is needed). Consider alternatives to the MLs for scab treatment.
7. Try to use anthelmintic treatments only when necessary. Use faecal egg count monitoring to aid the decision whether to treat lambs. Investigate ill thrift.
8. Consider whether it is necessary to treat all adult, fit ewes at tugging and at lambing time if *H. contortus* is not present on the farm. A number of ewes, left untreated will help to preserve susceptible parasites on a farm and may dilute the concentration of resistant parasites.
9. Use the most appropriate anthelmintic for the parasite to be treated, eg. benzimidazoles may be used for treatment for *Nematodirus battus* in young lambs, even if other classes are to be used later in the year. Another example may be the use of closantel (a product used mainly as a flukicide, but which also has action against *H. contortus*) for a specific *H. contortus* treatment.
10. Preserve susceptible parasites. If clean (or safe) pasture is available do not dose and move directly onto it as the only parasites that survive are likely to be resistant to the anthelmintic and will form 100% of the parasite population on the clean pasture. Either leave some animals undosed, or treat approximately seven days before moving, or seven days after moving if using a persistent product, so that susceptible parasites are allowed to populate the 'clean' pasture.

### Anthelmintic resistance in parasites of other species

Anthelmintic resistance in goats is generally a greater problem than in sheep, as their lack of development of immunity to parasites means that anthelmintic treatments have to be continued regularly throughout their life where they are grazing. Few products are licensed for goats and the difference in their pharmacokinetics, compared to sheep, has often meant that goats have been under dosed with anthelmintics. As the parasites that affect goats are the same as affect sheep, co-grazing sheep and goats should not be advised. BZ resistant *T. circumcincta* and *H. contortus* have been

reported in goats in the UK, as well as a holding with triple resistant *T. circumcincta*.

Anthelmintic resistance in cattle does not appear to be the problem that it is in sheep parasites and there have been few reports worldwide. However the number of reports has been increasing recently. ML resistance in *Cooperia* spp. has been reported in South America and New Zealand and on two farms in the UK.

Anthelmintic resistance in parasites of horses is known and documented but is outside the scope of this article.

### Future alternatives to anthelmintics

Breeding animals for resistance to parasites, resulting in animals that pass fewer parasite eggs in their faeces, is thought to be the best option in the long term. Research is taking place in many countries in many different breeds. Selection in hill flocks, producing resistant rams that will be used to produce commercial ewes with this trait, should lead to less pasture contamination around the lambing period and pasture of reduced infectivity for the lambs produced.

Use of biological controls has been investigated. Studies using *Duddingtonia flagrans*, a fungus that, when fed to the animal germinates in the faeces and traps nematode larvae and prevents their migration onto pasture, has been carried out in cattle and sheep. It has been found to be useful experimentally but some field studies have been disappointing. Alternative forages and feeds that may have anthelmintic properties have been investigated.

Vaccination development, particularly against *H. contortus*, is the subject of research in Scotland and Australia but recombinant vaccines have generally proved disappointing. Development of vaccines against other nematodes, which do not suck blood, is likely to prove more difficult.

It is likely that combinations of the



above, together with planned grazing management and restricted use of anthelmintics will have to be used in the future.

### Summary

Anthelmintic resistance is already a problem in the UK in some sheep flocks. The management of parasites on all sheep farms is important and expert advice, tailored for the individual farm, is essential to slow the development of resistance. It is to be hoped that alternatives to anthelmintics will become more viable in the future.

**Figure 3**  
Grazing management has an important role in parasite control

### INFORMATION

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# Protecting the Welfare of Farmed Fish

## AUTHOR

Andrew Voas

**The State Veterinary Service (SVS) has a statutory responsibility to protect the welfare of farmed animals and this extends to farmed fish. SVS veterinary officers have been required to give advice in specific cases where the welfare of farmed fish has been questioned. Current animal welfare legislation applies to fish in certain circumstances and covers farming, killing and transport. This article summarises the main provisions of existing and proposed legislation and also mentions other approaches that Government may take to improve fish welfare without involving legislation.**

### The Protection of Animals Act 1911 and The Protection of Animals (Scotland) Act 1912

This legislation consolidated various pieces of legislation concerning cruelty to animals from the 19th century. Section 1.1a of these Acts makes it an offence to *"wantonly or unreasonably do or omit to do any act causing unnecessary suffering to any animal; or cause, procure, or, being the owner, commit any such act."* The Acts apply to any domestic or captive animal and legal advice received by the Scottish Executive has been that they would therefore apply to all farmed fish including those kept in sea cages.

The Acts contain the concept of "unnecessary suffering" which can be reviewed depending on developments in current knowledge. It is probably fair to say that when the Acts were written they were not

intended to apply to fish but as our understanding of the capacity of fish to suffer has developed, so courts will be able to interpret the phrase *"unnecessary suffering"* in the light of existing knowledge. This therefore remains potentially useful legislation despite dating from almost 100 years ago.

To prove an offence under the Acts would require evidence of suffering, and that this was unnecessary and unreasonable. Although no prosecutions concerning fish farming have been taken under these Acts, an example of where the Acts could apply might be if sea cages were located in an unsuitable position where the nets could be deformed by currents or storms. If this was the case, and it could be shown that fish had suffered as a result of unreasonably siting the nets in this location, then an offence under the Acts might have been committed.

### The Agriculture (Miscellaneous Provisions) Act 1968

Section 1.1 of this Act states that *"any person who causes unnecessary pain or unnecessary distress to any livestock for the time being situated on agricultural land and under his control or permit any such livestock to suffer any such pain or distress of which he knows or may reasonably be expected to know shall be guilty of an offence."* This applies to any creature kept for the production of food and legal advice has been that "agricultural land"

An example of where the Acts could apply might be if sea cages were located in an unsuitable position where the nets could be deformed by currents or storms.



**Figure 1**  
Salmon cages in  
a sea loch

would include fish kept for the purpose of food production in fresh water or in salt water tanks on land, but would not apply to fish kept in sea cages.

This legislation followed the Brambell Committee Report and concern about factory farming in the 1960s. It provides for welfare codes for farmed livestock and for rights of access to land for inspectors to determine if an offence may have been committed under the legislation, but fish are not specifically covered by the legislation. The wording of the legislation is a slight advance on the 1911 and 1912 Protection of Animals Acts as it makes it an offence to cause unnecessary pain or unnecessary distress without this having to be demonstrated to be “unreasonable”.

### The Welfare of Farmed Animals Regulations 2000 and The Welfare of Farmed Animals (Scotland) Regulations 2000

Under these Regulations owners and keepers of animals kept for farming purposes must “ensure the welfare of animals under their care” and “ensure that the animals are not caused any unnecessary pain, suffering or injury.”

These Regulations specifically include fish in their scope but they are made under the Agriculture (Miscellaneous Provisions) Act 1968 so again are limited to animals kept on “agricultural land” which does not include fish kept in sea cages.

These Regulations arise from our obligation to implement European legislation, in this case Directive 98/58/EC. The general obligation to ensure the welfare of animals kept for farming purposes shows a change in emphasis from the 1911/12 and 1968 Acts which made it an offence to cause unnecessary suffering, to now also placing an obligation on the keeper to positively promote the welfare of the animal. These Regulations are useful in assisting enforcement action in that they allow for the service of improvement notices in situations where an inspector thinks that animals may be caused suffering if certain improvements are not made.

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**Figure 2**  
Dead fully grown salmon ('morts') collected from a sea cage. The skin loss and damage occurred after death

**Figure 3**  
Salmon parr (the freshwater stage) which died due to Saprolegnia - fungal infection

### The Welfare of Animals (Slaughter or Killing) Regulations 1995

These Regulations apply to animals bred and kept for the production of meat, skin, fur or other products so can be taken to apply to farmed fish. Regulation 4.1 requires that *"no person engaged in the movement, lairaging, restraint, stunning, slaughter and killing of animals shall cause any avoidable excitement, pain or suffering to any animal; or permit any animal to sustain any avoidable excitement, pain or suffering"*. Regulation 4.2 requires that *"no person shall engage in the movement, lairaging, restraint, stunning, slaughter or killing of any animal unless he has the knowledge and skill necessary to perform those tasks humanely and efficiently ..."*. There is therefore a general requirement that anyone killing farmed fish should have received sufficient training to kill fish humanely without causing unnecessary pain. Although there is a system for licensing of slaughtermen who kill terrestrial animals in abattoirs and which is administered by the Meat Hygiene Service, there is no equivalent system to licence individuals involved in killing fish.

### The Welfare of Animals (Transport) Order 1997

This requires that animals are transported in a way that does not, and is not likely to, cause injury or unnecessary suffering. It applies to all commercial transportation of animals including fish, and there are some specific provisions for the transport of fish including the need to transport them in suitable containers and with sufficient liquid. An example of where this Order could apply to farmed fish might be if fish are being transported in a way which causes injury to some of them. If for example a problem is identified in a suction system for moving fish from one site to another location, and it is known that the system is likely to cause injury, then it could be an offence under the Order to continue to use the system.

### Draft Welfare Bills

New animal welfare Bills have been proposed in England, Wales and Scotland and are currently in Parliament for discussion. These Bills are intended to consolidate and update the various pieces of existing welfare legislation and reflect the change in approach over the last

century from preventing cruelty to also promoting welfare, as it will become the duty of any animal keeper to ensure the welfare of the animal and to follow codes of practice concerning welfare where these exist

This legislation will apply to all vertebrates “kept” by man so will clearly cover all farmed fish, including farmed fish kept in sea cages, so removing the anomaly that the Agriculture (Miscellaneous Provisions) Act 1968 only applies to fish held on agricultural land. The Bills will have a very wide scope, covering the keeping of domestic animals as well as farmed animals, and will be 'enabling' legislation allowing further detailed legislation on specific areas to be introduced at a later date. However, it is not intended that the legislation will apply to commercial or recreational fishing or angling.

### Influences on Legislation

The original animal welfare legislation from the 19th Century and early 20th Century was introduced in response to public concern about particular issues, often represented via lobby groups and public opinion remains a significant influence on legislation today. However, later in the 20th Century scientific research was increasingly used to provide evidence when considering changes to legislation and the Farm Animal Welfare Council (FAWC) was established to provide independent scientific advice to Government on welfare issues.

After joining the European Union, British welfare legislation has been introduced to implement EC Directives, often following consideration of issues by the Council of Europe. In future the OIE is likely to play an increasing role in setting recognised animal welfare standards internationally, in the same way that it sets recognised

standards for the diagnosis and control of animal disease at present.

### Other approaches to improving animal welfare

It should be recognised that legislation sets a basic minimum standard for animal welfare, but producing legislation is not all that is done by Government to promote welfare. Welfare improvements can be brought about by different approaches to education, research, on-farm advice, etc. Government supports a significant amount of research into animal welfare, including fish welfare and this may bring about improvements in welfare directly

through improved knowledge within the industry, or be used as a sound basis when developing future legislation. A good example of this has

been the research on electrical trout stunning which arose following concerns expressed in a FAWC Report. This led to a Link-funded project with industry, Humane Slaughter Association and DEFRA funding to find an effective way of killing trout electrically rather than allowing them to suffocate in air as was standard practice at harvesting. Although the initial equipment had practical difficulties, the technology has now been developed into a reasonably practical device and there is a firm commitment from the industry to introduce this method within a short period.

Government also promotes the development of quality assurance schemes, which include a welfare component, and the development of welfare codes for different species. For terrestrial farm animals, detailed welfare codes have been developed in consultation with the industry. These are statutory codes in that although

Government supports a significant amount of research into animal welfare, including fish welfare

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**Figure 4**  
Trout in a  
freshwater loch  
–Sleeping Disease  
(a viral infection  
was suspected)



contravening the code in itself is not an offence, contravention of the code may be used as evidence to support a prosecution if animals are caused unnecessary pain or distress as a result.

In Scotland, the need for a voluntary welfare code for fish farming was recognised in the Strategic Framework for Scottish Aquaculture produced in 2003, which gave a commitment to producing a welfare code by 2004. It was realised that discussions in the Council of Europe on recommendations for fish welfare had been taking place over several years and the code would draw on some of the outcome of these discussions. The code was developed by the Scottish Aquaculture Health Joint Working Group, which includes representatives of Scottish Executive Environment and Rural Affairs Department (SEERAD), the industry, the Scottish Society for the Prevention of Cruelty to Animals (SSPCA), Compassion in World Farming (CIWF), State Veterinary Service (SVS) and Responsible use of Medicines in Agriculture (RUMA). It was an important principle from the start that recommendations were to be based on available scientific evidence, and that this would be a working document to be updated in the light of future scientific evidence.

The Welfare Code for Fin Fish Aquaculture has now been produced and is available at <http://www.scotland.gov.uk/resource/doc/1062/0004654.pdf>.

The Welfare Code accepts the “five freedoms” principle used by the Farm Animal Welfare Council as far as these can be applied to fish, i.e. freedom from hunger and malnutrition; freedom from discomfort; freedom from pain injury and disease; freedom to express normal behaviour and freedom from fear and distress. The Code covers veterinary health plans, stockmanship, water quality, stocking density, grading, transport, disease, harvest and euthanasia. It is recognised that water quality parameters are crucial to fish welfare and where water quality parameters have been agreed by the industry on the basis of scientific evidence, these have been given and these will be updated as new scientific evidence becomes available.

### Conclusion

Over the last century welfare legislation has progressed from dealing with cruelty after it has occurred to also requiring the promotion of welfare of all vertebrates kept by man. This has reflected developing concern and scientific evidence about the capacity of animals to suffer and how they can benefit from improvements to the way in which they are kept. In future, legislation will clearly consider the welfare of all farmed fish and be applicable to them. Codes of practice will also become increasingly important, not only to ensure compliance with minimum legal requirements but also to demonstrate best practice which will be demanded by industry quality assurance schemes.

### Acknowledgement

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#### INFORMATION

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# Introduction to the Animal By-Products Regulation (Regulation (EC) 1774/2002)

## Introduction

A European Community Regulation is directly applicable in all Member States and does not need to be transposed into national legislation as with a Directive. However, Member States do need national legislation to make the Community Regulation work. For example, the Community Regulation refers to the competent authority in the Member State. Consequently, the national legislation needs to define competent authority. It is also necessary to set out procedures for issue of approvals, appointment of inspectors, enforcement and penalties. In England this national legislation is the Animal By-Products Regulations 2005 – referred to as the National Regulations. There is parallel legislation in the Devolved Administrations. The Secretary of State (or Devolved Administration) is the competent authority and responsible for the issue of approvals. In licensed meat plants, the Meat Hygiene Service (MHS) is responsible for enforcement. Otherwise, the local authority is responsible for enforcement.

## History

Animal by-products legislation safeguards animal health and public health. For example, the Dogs Act 1906 required disposal of carcasses so as to be inaccessible to dogs as the original intention was to control hydatid disease, a potentially serious zoonosis. This provision has only just been replaced by the current legislation.

In the past, much of the other by-product legislation was piecemeal - generally associated with particular disease Orders which would specify disposal of carcasses and other by-products so as to eliminate the risk of the particular disease. There

were also strong controls in relation to international trade. The importing country specified the standards that animal by-products must meet in order to safeguard animal health and public health in that country. Such individual controls have now been replaced by the European Animal By-Products Regulation (1774/2002) which sets common standards throughout the EU and regulates imports from third countries into the EU.

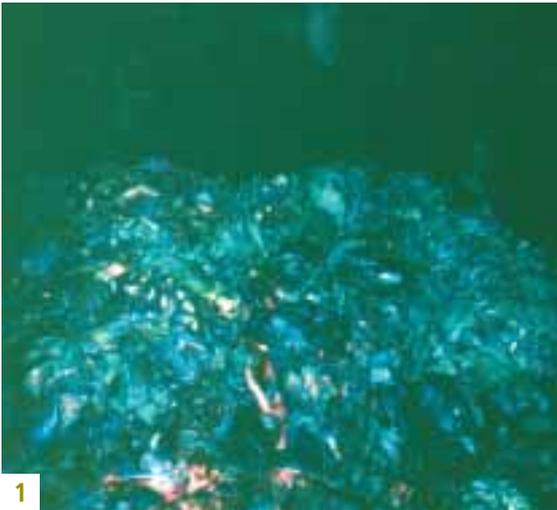
Another important piece of legislation was the Diseases of Animals (Protein Processing) Order of 1981, to control the contamination of animal feed with *Salmonella* bacteria. *Salmonella* bacteria cause disease in livestock, and in turn in humans. The source of the *Salmonella* was often traced to meat and bone meal (MBM) in the ration. Meat and bone meal is an excellent source of protein, and at the time was widely used in livestock rations. This Order gave the SVS power to take samples of meal at rendering plants. If MBM failed the *Salmonella* test, it could not be used for livestock feed and the operator had to carry out an investigation, take corrective measures and either reprocess the failed material or dispose of it in some other way.

In 1988, the BSE epidemic started, with MBM rapidly being identified as the source. This led immediately to the ruminant feed ban - ruminant derived material could not be fed back to ruminants. This virtually stopped the recycling of the BSE agent, although as the disease has a long incubation period, the number of cases continued to rise for several years. The ban on Specified Bovine Offal (SBO) soon followed. SBO were the tissues which were

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**Figure 1**  
SRM stained with patent blue V in the reception pit at a category 1 rendering plant



**Figure 2**  
Approach to reception (unclean) building at rendering plant. Yards and surrounds must be clean and tidy

thought could carry and transmit the BSE agent. The term we now use is Specified Risk Material (SRM) which covers all the tissues in cattle, sheep and goats which could carry and transmit BSE or Scrapie.

Further control measures followed; but some BSE infection was managing to get through. Consequently the reinforced feed ban came in in 1996 and was fully in place by 1 August 1996. Since then, it has been illegal to feed animal protein to livestock. There are limited exceptions such as feeding fishmeal to non-ruminants - but these are strictly controlled.

The UK's national measures to control BSE were in place at an early stage and the EU subsequently drew up harmonised control measures for animal by-products to cover both conventional pathogens and BSE. These appeared as Directive 90/667, which was implemented in GB by the Animal By-Products Order 1992 (ABPO). ABPO was amended several times during the 1990s and a new Order produced in 1999 which consolidated previous amendments in national and EU legislation.

ABPO gave us, for the first time, a comprehensive set of controls for animal by-products. For the first time rendering plants and knackery yards had to be approved. There were other types of premises which had to be registered - petfood plants, hunt kennels, zoos and maggot farms. ABPO did not cover SRM so some premises were subject to both ABPO and the SRM

legislation, while some were only subject to one or the other.

The EU legislated after GB for BSE and Scrapie control (collectively known as TSEs). So GB was little affected by the introduction of European TSE legislation, as we were 'ahead of the game'. The European measures were consolidated and updated in 2001 as the TSE Regulation (999/2001).

In October 2002, the Animal By-Products Regulation (1774/2002) followed, replacing 90/667. So this is the current position - these two significant pieces of European legislation are in place. Either or both may apply depending on the circumstances. The intention is that the ABP Regulation represents a comprehensive system of controls which will be in place for the long term. On the other hand, it is intended that some of the controls in the TSE Regulation may be relaxed in the medium term, when the TSE situation improves. For example, the ABPR permits certain types of by-product subject to certain standards of processing to be used in livestock feed. However, at present, the TSE Regulation prohibits this. The intention is that in the longer term, some processed animal protein will be allowed back into livestock rations.

### Layout of the Regulation

At first sight, 1774/2002 appears a daunting document - it runs to 149 pages in the consolidated version. As with all European legislation, there is a preamble -

which sets the legislation in context. Then there are the Articles. These are the main legal points. If the reader looks at the relatively few pages taken up by the Articles, then the Regulation appears a lot more manageable. The bulk of the Regulation is made up of Annexes. These set down detailed rules, when required by the Articles. Unfortunately, unlike some British legislation, European legislation does not begin with an index.

Consequently, there are two simple procedures for making this Regulation more user friendly. First, make an index - simply to show what each Article and each Annex deals with. Secondly, put a numbered marker at the beginning of each Annex.

To take a simple example - to find the requirements for a storage plant (where processed material is stored) - look at the index and see that Article 11 deals with storage plants. Then turn to Article 11 which states: (a) storage plants must be approved by the competent authority, (b) to gain approval, storage plants must comply with Annex III, Chapter III, and (c) they must be inspected by the competent authority. Then turn to Annex III Chapter III to find more detailed rules.

## 1. Articles

I will now go through the Articles, highlighting some of the main points. The purpose of the Regulations is to safeguard animal health and public health. Naturally, it is necessary to know what is excluded from the scope. The main exclusions are (a) wild animals, unless affected with a communicable disease, (b) petfood sales from butchers shops, and (c) catering waste unless it originates from international transport or is destined for animal feed or it is destined for a composting/biogas plant. Otherwise, catering waste can continue to go to a licensed landfill and is subject to Environment Agency control. 'Catering waste' is waste from domestic and commercial kitchens. Other cooked food

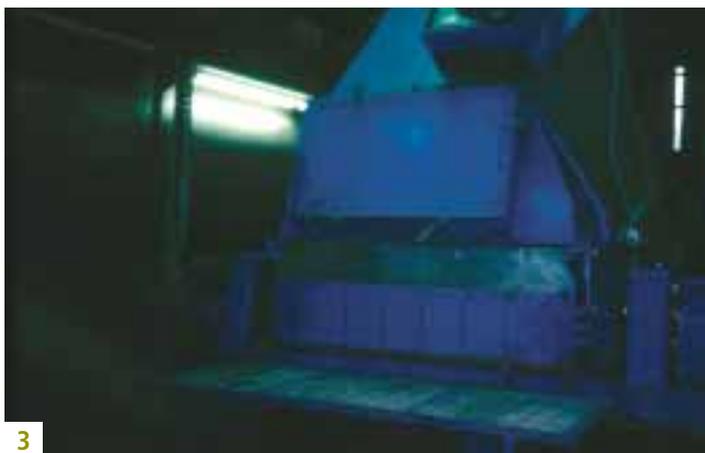
waste, e.g. from shops and factories, is not catering waste. However, there is a derogation allowing this material also to go to landfill. The derogation expires at the end of 2005 but is likely to be extended for those products that are not considered to pose a risk to human and animal health.

Animal by-product is defined as carcases, parts of carcases or other products of animal origin not intended for human consumption. The important word is 'intended'. Take the example of offals. They may be fit for human consumption; but because of the limited demand for offal for human consumption, the decision is taken to sell them for petfood. At that point, the material becomes a (category 3) by-product and must be handled, stored, transported, labelled and documented as such. They must not subsequently be diverted back into the human food chain.

The Regulation classifies by-products as category 1, category 2 or category 3 according to risk. Category 1 is the highest risk and includes SRM, carcases containing SRM at the point of disposal, zoo animals, international catering waste, experimental animals and animals with residues of illegal drugs. Category 3 is the lowest risk and includes material which could have been used for human consumption or was originally intended for human consumption and is no longer required. It also includes most hides and blood. Category 2 is the medium risk and is basically the default category for material, which is neither category 1 nor category 3. Carcases of animals dying on farms are category 2. Pig and poultry carcases remain category 2. However, cattle/sheep/goat carcases which still contain SRM at the disposal point (renderer/incinerator) become category 1.

The Regulation then sets out the legal disposal routes for by-products. For category 1 material, the choice will be basically a category 1 rendering plant or incineration. However, international

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**Figure 3**  
By-products go into a crusher before going into a rendering-cooker

**Figure 4**  
Cooked material emerging from a continuous rendering cooker

catering waste can be disposed of to a licensed landfill which has been specially approved. For category 2 material, again the main disposal routes will be rendering or incineration. However, if a communicable disease is not suspected, then carcasses can go to a 'Collection Centre' to be prepared for feeding to approved 'Final Users' (zoo animals/packs of hounds/maggot farms). Collection Centres include knackers' yards and hunt kennels, which receive carcasses. When the Regulation was introduced, hunt kennels which wished to continue receiving carcasses from farms had to make considerable improvements to gain approval. Knackers yards previously approved under ABPO had little problem gaining the new approval, as standards were roughly equivalent.

Category 3 material can be rendered, incinerated or used for petfood or technical products. The Collection Centre/Final User route is also available. However, the 2 new methods permitted by the Regulation are composting and biogas plants.

If different categories of material are mixed, then all the material is classed as the higher risk category.

The Community Regulation allows composting and biogas plants for the first time. It does not set standards for composting and biogas plants dealing with catering waste only. For the time being, individual Member States can set

their own standards for catering waste. Defra commissioned a risk assessment following which certain sets of standards were drawn up. These are included in the National Regulations.

The Articles then go on to set down conditions for transport, trade, approval of the various categories of premises, derogations, plants own controls and official controls. 'Derogations' covers cases where Member States may allow exemptions to the usual legal requirements - such as allowing burial of carcasses in remote areas. Article 33 gives the power to modify the Regulation following advance in scientific knowledge etc.

## 2. Annexes

The topics covered in the Annexes are -

- I Definitions (but beware there are also definitions at Article 2)
- II Transport and record keeping
- III Approval of intermediate plants and storage plants
- IV Approval of incinerators
- V Approval of rendering plants
- VI Extra conditions for category 1 and category 2 rendering plants.  
Conditions for composting and biogas plants
- VII Extra conditions for category 3 renderers
- VIII Petfood and technical plants
- IX Collection Centres and Final Users
- X. Model Health Certificates for Imports

XI List of third countries from which Member States may authorise imports.

For updates on legislation, you should consult the Animal By-Products website on [www.defra.gov.uk/animalh/by-prods/legislation.htm](http://www.defra.gov.uk/animalh/by-prods/legislation.htm)

### Role of the SVS

A large number of enquiries are received concerning the requirements of the Regulation. Complaints are received, some of which are passed straight to the relevant local authority department and some will result in joint visits. However, the main responsibilities are (a) approval of premises on behalf of the Secretary of State (or the work leading up to approval on behalf of the Devolved Administration) and (b) routine inspections.

When the Community Regulation was published, many of the premises, which were affected were already known. However, those already approved under ABPO may have been required to meet higher standards. Additionally, many premises had simply been registered under ABPO and these premises would require considerable improvements if they were to gain an approval. Then there were premises, which would require an approval for the first time, such as, non SRM incinerators, intermediate plants, storage plants and technical plants. Finally, there were the composting and biogas plants, which were to be allowed.

Consequently, the SVS was faced with a vast amount of work in approving or refusing to approve all these premises. So initially, approvals were done by means of temporary, general approvals to allow inspections to be carried out and premises time to make the necessary improvements to structures and working practices.

The Defra website proved extremely useful in the early days, and continues to be widely used. Many enquiries and requests for application forms were dealt with by means of a relatively brief telephone discussion, then directing the enquirer to the website. The by-products

page is located at [www.defra.gov.uk/animalh/by-prods/default.htm](http://www.defra.gov.uk/animalh/by-prods/default.htm). The main text in the page deals with recent and on-going matters of interest. The list on the left hand side of the page sub-divides the by-products field into a number of separate topics. Clicking on the relevant topic leads to the relevant information, with further hyperlinks to guidance notes and application forms. Many premises requiring approval obtain their application forms from the website, rather than by post from the SVS.

At first sight, the application forms appear rather complicated. They are generally about 12 pages long. However, closer inspection reveals that they are intended to be helpful. Each question has 4 sections. The first describes the legal requirements. The second gives a brief explanation. The third is a box for the applicant to fill in and the fourth is a box for the inspecting officer to fill in. Both the third and fourth boxes will need to be supplemented, for some questions. For example, all applications require a site plan showing flows. This type of form has 2 main advantages. First, the applicant has a very good idea of what is going to be required in order to gain an approval. Secondly, the inspecting officer can carry out a preliminary assessment in the office, before visiting the premises. This is particularly important for complex premises such as rendering plants and also very useful to highlight potential problems, in advance of the visit.

It is sometimes necessary to carry out a preliminary advisory visit in advance of an application, to explain the legal requirements and make a preliminary assessment of the premises. This has been useful recently in the case of on farm incinerators. There are high powered salesmen trying to sell incinerators to farmers. They say that their incinerator is 'Defra approved' but do not explain that an individual approval is required for each

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**Figure 5**  
Transport of by-products must be in leakproof, covered, cleanable, labelled vehicles/containers

incinerator at each site. For many farmers, an incinerator will not be the most convenient or cost effective way of disposing of carcasses and they appreciate objective advice rather than simply the incinerator company's sales pitch.

It is beyond the scope of this article to cover the detailed approval requirements and inspection procedures for each type of by-product premises. However, by way of overview, there are certain general principles, which apply in most cases.

The by-products must be received in covered, leak-proof containers - correctly identified and documented. The premises must have a system of checks for material, which is received. The by-product must be received into a building, which is pest-proof, drained and easy to clean. It must be dealt with as soon as possible unless, for example, category 3 material for petfood, can be frozen and used later.

Intermediate plants bulk up consignments for onward shipment. Otherwise, the by-product is normally subject to some sort of process. This may involve heat for a certain time. It may also involve pressure. How do they measure temperature/pressure/time and how is it recorded? How often is the measuring equipment calibrated? It may involve a chemical treatment. How do they measure the amount of chemical used? What checks do they make? For example,

pH. How can they be sure that no material bypasses the required process?

After the treatment, the material has to be stored in a separate 'clean' area. Again, this room should be pest-proof and easy to clean. Generally, drainage will be required and temperature controls may be required. There must be no risk of the processed material becoming contaminated - either from raw material or from any other source. The raw material threat includes not only direct contamination; but also indirect contamination from personnel, equipment etc. Do the same staff work with both raw material and processed material? If so - what hygiene precautions are taken - such as hand washing, separate colour coded boots and overalls? Is equipment used on both raw material and processed material? Ideally, it should be dedicated to one or the other; but if it has to be shared there must be a written cleansing and disinfection protocol.

Then the processed material will have to be despatched. Is it packaged before despatch? If not, how is it protected from contamination? What documentation is carried out? Are the vehicles covered and leak-proof?

For all premises, there will be a number of general points such as - proximity of livestock, perimeter and surrounds, facilities for cleansing and disinfection of vehicles and equipment, staff amenities, drainage and pest control.

Similar general principles apply across the board; but obviously vary depending on the type of premises. For example, at Collection Centres producing material for feeding to zoo animals etc, the 'treatment' is usually staining the meat with a black dye. This simply identifies the material and is an important part of the animal health and public health controls; but does not actually sterilise the meat. Consequently the clean room would perhaps be better described as 'cleaner' room. However, the same general principles of one way-flow from unclean

to clean still apply. The other extreme in terms of treatment is incineration – where the by-products are reduced to a dry ash. Obviously, however, the raw material has to be held securely prior to incineration. The premises must be kept clean and the ash removed without risk of contamination, and then stored safely until despatched to a licensed landfill site.

It will normally take several visits with improvements being carried out, before the premises can be approved. In England, approvals are issued by the Divisional Veterinary Manager. If however, approval cannot be recommended, then a fully documented case is sent to Defra's, BSE Division at Page Street in London recommending refusal to issue an approval. There are slightly different procedures in the Devolved Administrations.

Routine inspections are carried out according to the degree of risk attached to the premises. Any premises where SRM is handled or destroyed will receive monthly inspections. Otherwise, the majority of inspections will be 3 monthly. However, some of the lowest risk premises such as tanneries will be inspected every 6 months. The SVS may carry out joint inspections with other bodies such as local authorities or the Environment Agency, as appropriate. Because of past problems concerning diversion of material intended for petfood back into the human food chain, local authority officers are invited to attend inspections of petfood plants. Where there are two tiers of Local Government, both the County Trading Standards Department and the District Environmental Health Department would be invited.

The routine inspections are basically a scaled down version of the approval inspections. In addition, tracing/reconciliation checks are also carried out. There is a system in place which should, at least, detect any gross fraud/diversion. There are 2 main



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circumstances where disposal to illegal destinations may occur:

(a) Where material has a relatively low value, e.g. 20p per pound for petfood use and it could suddenly increase its value to say £2 per pound to be used for human consumption - some unscrupulous operators are going to be tempted to divert the material into the human food chain, as the potential rewards are so great. This has happened in the past and several, well publicised cases resulted in prosecution.

b) Where materials cost a lot of money to get rid of e.g. the waste from a Collection Centre may cost £90 per ton for removal and disposal by a renderer. If the operator knows somebody with a JCB, then there may well be a temptation simply to bury it for a much lower cost.

The purpose of this article has been to provide an introduction to the animal by-products legislation and the role of the SVS. Further information, including hyperlinks to the legislation can be obtained on the Defra website.

**Figure 6**

Control room with chart recorder for continuous rendering cooker

#### INFORMATION

Since this paper was written, the BSE Division in Defra has been renamed the BSE and Animal By-Products Division to reflect its work under the Animal By-Products Programme.

Roger McCamley is a Veterinary Officer with the State Veterinary Service, Exeter

June 2005

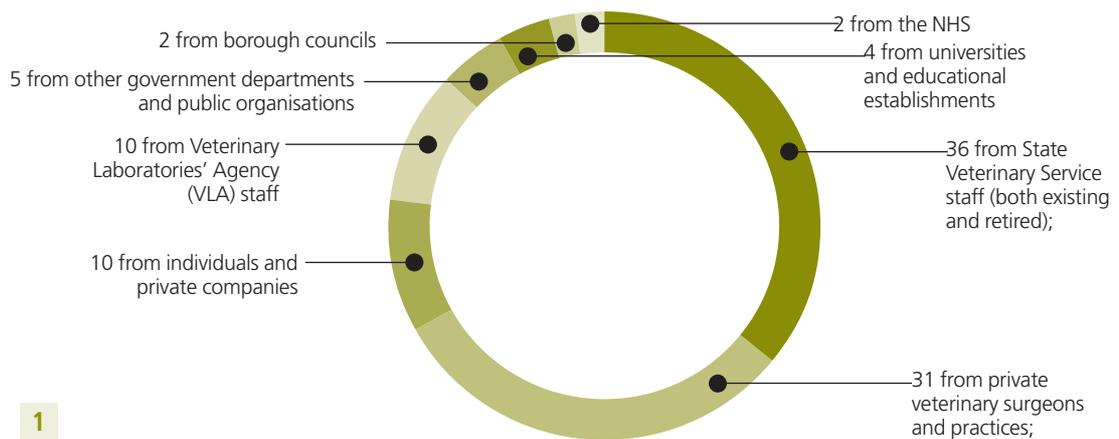
# The Customer Feedback Survey

**AUTHOR**

Liz Moorman

**For the past 60 years, the State Veterinary Journal (SVJ) has aimed to provide useful and interesting information to its readers. We circulated a customer survey form with the previous edition Vol 15 No 1 2005, seeking comments from readers to provide us with feedback that will help us to ensure future editions continue to be both useful and interesting.**

We are very grateful to the 100 readers that completed and returned their forms. The completed surveys break down into:



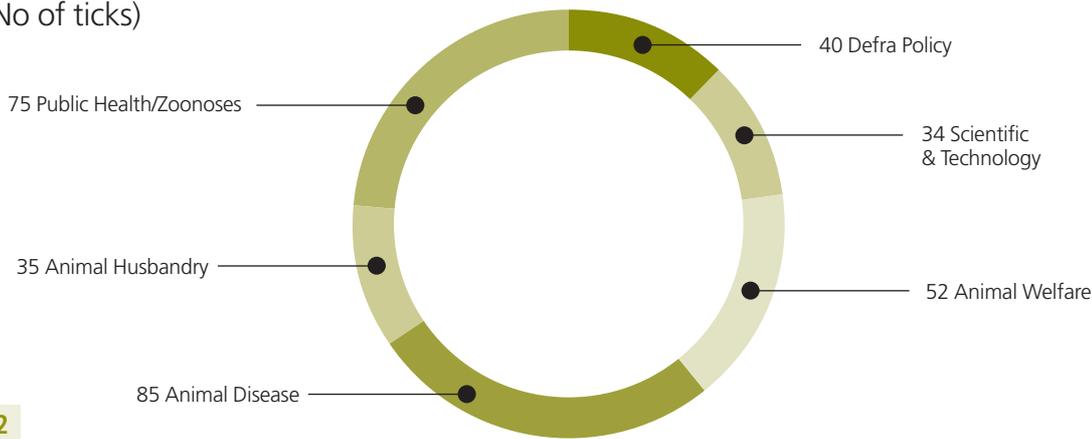
**Figure 1**  
breakdown of  
respondents to the  
survey

The overwhelming majority of respondents (90) believe that the journal meets its published aims. The journal is of general use to over half of the respondents which suggests that they read it of their own free will and not just for work purposes, although, 56 respondents feel that it is relevant to their current job. Furthermore, 53 respondents feel that it is a useful source of reference material and relevant to their continued professional development.

Most respondents feel that the most useful articles are those on animal diseases. Articles on public health and zoonoses were the second most useful, the third most useful were those on animal welfare, followed by those on Defra policy, scientific and technological articles and then articles on animal husbandry. Some respondents helpfully suggested topics for future articles, such as animal transport and export controls. We are trying to commission articles on these suggested topics. If you are interested in writing for the SVJ (now known as the GVJ), please contact the Production Team at the address on the inside cover of this edition who will be pleased to advise on style and length of articles. We would be particularly interested in publishing short articles of no more than 1,000 words.

**The SVJ contains articles on the subjects listed below. Which do you find most useful?**

(No of ticks)



2

There are some contrasting views on the layout of the Journal. The overwhelming majority of respondents indicated that they liked the format of the SVJ finding it easy to understand and well presented (fig 3). Some, however, suggested ways in which it could be improved. We have tried to incorporate these suggestions in the new look of the GVJ which we hope that you like and find appealing. We have also decided to change the title of the Journal to more accurately reflect that it is aimed principally at veterinary surgeons working within or alongside Government departments.

**What is your overall impression of the SVJ?**

	Yes	No
The Journal is easy to understand and well presented	94	2
Images are clear and relevant	90	2
Technical jargon is kept to a minimum and is clearly explained	86	2
Provides information that you cannot find elsewhere?	63	19

3

We will continue to produce the SVJ in the form of colour printed booklets as this is what the majority of respondents would like. However, the Journal is also available on the Government Veterinary Surgeons (GVS) website and if you would like to receive it by email please let the Production Team know (gvj@defra.gov.uk).

We received 100 completed surveys which, admittedly at first glance represents only a fraction of the full readership. Nevertheless they gave us a fascinating insight into thoughts on the SVJ (now GVJ). The majority of respondents feel that the Journal meets its published aims and provides useful information whilst others provided constructive comments on how it could be improved. We are very grateful to those who completed the survey and for their helpful comments which we will take into account when planning future editions. The Production Team are always happy to receive comments or suggestions which may be directed to the address on the inside front cover of this journal or by email to gvj@defra.gov.uk.

**Figure 2**  
Respondents' reveal which subject areas they find most useful

**Figure 3**  
Respondents' overall impressions of the journal

**INFORMATION**  
Liz Moorman works in the GVJ Production Team, Defra  
September 2005

# The Veterinary Head of Profession (VHoP) Initiative

## AUTHOR

Atinuke Lebechi

### Figure 1

Dr. Debby Reynolds, Chief Veterinary Officer (UK) and Veterinary Head of Profession

### Figure 2

Government departments and agencies represented on the GVS Steering Group



1

**The management of the work programme delivered under the VHoP initiative is supported by the Veterinary Services Team (VST) based in Defra, Page Street, London. This team was brought together in January 2005 to strengthen relationships with the veterinary profession and to support the CVO (UK) in her role as VHoP in the Civil Service.**

## GVS Steering Group

The GVS Steering Group currently consists of senior veterinary surgeons from across ten government departments and agencies (fig 2) with representatives from the devolved administrations in Scotland and Wales. The steering group supports the VHoP in developing a challenging agenda for the GVS. The

group has already met twice this year, most recently in October, with outcomes including the GVS Business Plan 2005/6, publication of a Veterinary Skills and Expertise Framework under the Professional Skills for Government (PSG) initiative and formation of a statement on Continuing Professional Development (CPD).

The departments/agencies represented on the Government Veterinary Surgeons Steering Group are:

- Centre for Environment, Fisheries and Aquaculture Science (CEFAS),
- Department for Environment, Food and Rural-Affairs (DEFRA)
- Department for International Development (DFID),
- Food Standards Agency (FSA),
- Home Office,
- Ministry of Defence - (civilian vets),
- Meat Hygiene Service (MHS),
- State Veterinary Service (SVS),
- Veterinary Laboratories Agency (VLA),
- Veterinary Medicines Directorate (VMD),
- The devolved administrations - Scottish Executive (SEERAD) and Welsh Assembly Government (WAG), and
- The CVO (Northern Ireland) joins the group as an observer

2

## The 2005 GVS Conference

This took place at the VLA in Weybridge on Tuesday 7 June 2005, and was jointly hosted by Debby Reynolds CVO (UK) and Professor Steven Edwards (Chief Executive of the VLA).

The aim of the conference was to introduce participants to the Veterinary Head of Profession initiative and provide them with an overview of the roles of veterinary surgeons within government. The conference also included presentations on the latest proposals to amend and modernise the Veterinary Surgeons Act. These changes could potentially have a significant impact on the GVS, particularly if mandatory CPD and requirements for a licence to practice are introduced.

A high percentage of delegates rated the conference as successful. For most people the presentations gave an insight into the role of veterinary surgeons across Government. As one delegate said; "The conference highlighted the diversity of

the GVS and provided a good opportunity to hear about the breadth of work carried out by veterinary surgeons in other government departments'.

The 2006 GVS conference will be organised jointly with the Association of Government Veterinarians (AGV). Although planning is still very much in its early stages, we will take into account feedback received from the Weybridge conference. More details will be made available on the GVS website at [www.gvs.gov.uk](http://www.gvs.gov.uk) in due course.

### Head of Profession Questionnaire

Following the conference, GVS members were surveyed for their views on the role of the VHoP. The questionnaire was based around three key areas:

- i) Purpose of the Veterinary Head of Profession;
- ii) Career development within the GVS; and
- iii) Communications within the GVS.

180 completed forms were returned from an estimated total number of 570 veterinary surgeons in government. Preliminary results from the survey have been discussed by the GVS Steering Group who have been asked to reflect on the results with veterinary surgeons who work in their respective Departments. A summary of the results will be made available on the GVS website. These results will be instrumental in guiding the future work on the Head of Profession initiative.

### Visits to UK Veterinary Colleges

A series of visits between senior veterinary surgeons in government and veterinary colleges in the UK is currently underway. The purpose of these visits is to establish effective dialogue between government and the colleges following an informal meeting Debby Reynolds had with the Deans last year. Cambridge

Veterinary School and the University of Bristol, Department of Clinical Veterinary Science, have both already been visited and we are beginning to put plans in place for visits to the veterinary colleges in London, Edinburgh, Glasgow and Nottingham. These are anticipated to take place in 2006. For each completed visit, a brief overview of the day is available on the GVS website at [www.gvs.gov.uk](http://www.gvs.gov.uk)

Following discussions held with the veterinary colleges and with the support of the GVS Steering Group, Debby Reynolds has formed the GVS Veterinary College Liaison working group to address the current need for closer interaction between veterinary colleges and key government departments.

### GVS Business Plan 2005/6

This document sets a framework for various workstreams, which support the VHoP initiative. These workstreams include the development of a learning and development framework with specific projects established to facilitate access to learning - including interchange opportunities and expanding the veterinary expertise and skills framework under the PSG initiative to encompass the work of all government veterinary surgeons.

Effective communication within the government veterinary community is important and work is underway to establish a robust communications network through events management, visits, website and other appropriate media.

It is anticipated that these workstreams will deliver outcomes and benefits that will strengthen the profile of veterinary leadership and contribution of veterinary expertise within, across and outside government. Other benefits will be the opportunities to share best practice and facilitate information sharing on learning opportunities across the GVS.

→ CONTINUED ON p46



5

**Figure 5**  
The PSG framework - Civil servants will be required to demonstrate skills and expertise in these four areas at the appropriate level in relation to their job and chosen career path

### Professional Skills for Government (PSG)

The Cabinet Office has recently introduced the Professional Skills for Government initiative, which aims to provide all members of the Civil Service with the skills and experience needed to design and deliver 21st century services. It is a major, long-term change programme designed to ensure that civil servants, wherever they work, have the skills and expertise to enable their Departments or agencies to deliver high quality services. This represents a move away from the concept of “generalist” and “specialist” to three career groupings:

- policy delivery,
- operational delivery, and
- corporate services delivery.

PSG will require civil servants to demonstrate skills and expertise in four areas at the appropriate level in relation to their job and chosen career path. These four areas are leadership, core skills, professional expertise and broader

experience (fig 5). These will be tested at three key career gateways: entry to Grade 7 (or equivalent), to Senior Civil Service (SCS) Pay Band 1, and to SCS Pay Band 3.

More information about each of these areas can be found on the Cabinet Office’s PSG website: [www.civilservice.gov.uk/skills](http://www.civilservice.gov.uk/skills)

As part of PSG, Heads of Profession have been asked to produce a framework for the skills needed by members of their profession. A GVS working group chaired by Richard Drummond, Head of Veterinary Exotic Diseases Division (Defra) has developed a framework called ‘Veterinary Skills and Expertise Framework’. The framework aims to identify those areas of skill and knowledge building which are relevant and specific for veterinary surgeons in government and currently covers the requirements at Grade 7 (equivalent), SCS Band 1 and SCS Band 3 in accordance with Cabinet Office guidelines. This framework can be viewed via the GVS website at [www.gvs.gov.uk/pdf/psg-framework171005.pdf](http://www.gvs.gov.uk/pdf/psg-framework171005.pdf) and on the Cabinet Office PSG website.

### Continuing Professional Development (CPD)

A CPD Working Group convened in September 2005 to consider key issues for CPD in relation to veterinary surgeons in government under the VHoP initiative. This is against the backdrop of the modernisation of the Veterinary Surgeons Act which could see a move towards competence based mandatory CPD.

At this meeting some common barriers to CPD were acknowledged including that payment of RCVS fees are not made by all government departments and non-veterinary managers may be less aware of the CPD needs of veterinary staff. There was recognition of opportunities to share good practice on learning and development with examples provided

from the Home Office, MHS, VLA and the SVS.

The GVS working group on CPD is currently finalising a statement of CPD responsibilities for government veterinary surgeons. The aim of the statement is to clarify the responsibilities of individual veterinarians, their line managers, departments and the VHoP in assuring veterinary surgeons working in government have the necessary skills and expertise to deliver in their area of work.

With the initial stage of Veterinary Skills and Expertise Framework finalised we envisage combining the PSG and CPD working groups to consolidate a learning and development framework for the GVS by March 2006.

### Looking to the future

A number of events are already planned for 2006. With the establishment of a GVS - Veterinary College Liaison Working Group, further visits to the UK veterinary colleges are planned, with a focus on GVS participation in undergraduate teaching.

The combined GVS – AGV Conference planned for March/April 2006 will be an opportunity for government veterinary surgeons across departments and agencies to network and further contribute to developing the Veterinary Head of Profession initiative.

Do you know that you can subscribe to the GVS website to receive regular updates? Just click on the subscribe button at **[www.gvs.gov.uk](http://www.gvs.gov.uk)**

The Veterinary Services Team also welcomes invitations to meet Government Veterinary Surgeons or to contribute to team events or meetings.

If you want to know more about the Veterinary Head of Profession initiative or GVS then visit

**[www.gvs.gov.uk](http://www.gvs.gov.uk)** or you can contact us at

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#### INFORMATION

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October 2005

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