



Annual Report on Surveillance
for Veterinary Residues in 2001



Contents

Chairman's introduction	3	The UK's Surveillance Schemes as part of the Regulatory Process for Veterinary Medicines	18
The Veterinary Residues Committee	4	Types of Compounds Analysed for in the National Surveillance Scheme	20
The VRC's First Year	6	Foods Analysed under the Non-Statutory Surveillance Scheme	21
Non-Statutory Planning Sub-group	8	New Approach to Presenting the Results	22
Communications Sub-group	9	National Surveillance Scheme – Significant Findings	22
Feed Additives Sub-group	10	Non-Statutory Scheme – Significant Findings	27
Overview of Surveillance for Veterinary Residues	11	Results from Non-Government Sources	29
Maximum Residue Levels, Action Levels and Differential Action Levels	13	Conclusions from Surveillance for Residues in the UK in 2001	30
How does the National Surveillance Scheme work in Great Britain?	14	Work for the VRC in the Coming Year	31
The Effect of Foot and Mouth Disease	15	Glossary	32
How does the Non-Statutory Scheme work?	16		
Who is involved in the UK's Surveillance for Veterinary Residues?	17		



Chairman's introduction



Dear Reader

On behalf of the Veterinary Residues Committee it is a great pleasure for me to introduce our First Annual Report, which covers 2001. The scope of the Committee's work includes not only the health implications arising from the nature and levels of veterinary medicines and growth promoters in animal products intended for human consumption in the UK, but also those of a number of other potential organic and inorganic contaminants.

The Committee sees its role as:

- providing high quality, independent, expert advice to the Veterinary Medicines Directorate and the Food Standards Agency;
- overseeing the residue monitoring programmes and surveys to ensure that they are concentrated on issues of possible concern and are well conducted; and
- encouraging regular dialogue with stakeholders in the promotion of good practices; and taking other initiatives where relevant to attain the Committee's mandate.

This requires close collaboration with a number of government and other organisations. The Committee is very grateful to the Border Inspection Posts, the Laboratory of the Government Chemist, the Central Science Laboratory, the State Veterinary Service, the Meat Hygiene Service, the Department of Agriculture and Rural Development in Northern Ireland and a number of others who have enabled the Committee to fulfil its functions.

The Committee is new and, not surprisingly, has been unable to do everything in its first year that the members would like to have accomplished. However, we hope that you will agree on reading this Report that the Committee has made good progress.

Our Annual Report is in two sections. In this, the main Report, we provide a summary of our work in the past year. It shows the initial priorities identified by the VMD, FSA and members themselves and how these have been addressed. The second section, which is available either through the VRC and VMD websites or in hard copy, provides the raw data seen by the Committee.

We hope you will find this Report both informative and interesting. As it is our first Report we would particularly appreciate feedback on its usefulness and any suggestions for improvement.

Yours sincerely,

PROFESSOR JIM BRIDGES

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The Veterinary Residues Committee

We have a wide range of expertise and the members were chosen to represent different groups who would have an interest in residues surveillance.

Why was the committee set up?

Our committee was set up in January 2001. It replaces the Advisory Group on Veterinary Residues (AGVR), the previous committee that advised on veterinary residues surveillance. None of the Veterinary Residues Committee members are serving civil servants. There is a policy of making advisory committees more open and independent of Government; the Veterinary Residues Committee is part of this.

As part of this openness, the agendas, the papers that we consider and the minutes of our meetings are on our website:

www.vet-residues-committee.gov.uk

Who is on the committee?

The members were drawn from: consumers, the farming community, local authorities and industries associated with farming and food. We have a wide range of expertise and the members were chosen to represent different groups who would have an interest in residues surveillance. Our members and the groups they were appointed to represent are:

Professor Jim Bridges	Chairman/Toxicologist
Mrs Dorothy Craig MBE	Deputy Chair/Consumer
Mr John Ambrose	Local Authority
Professor Keith Anderson	Food Industry
Professor Alan Boobis	Toxicologist
Dr Paul Brantom ¹	Toxicologist/Food Safety
Mr Martin Cooke	Retail Industry
Mr Neil Cutler	Farmers
Professor Julie Fitzpatrick	Veterinarians
Dr Keith Lawrence	Pharmaceutical Industry
Dr W John McCaughey	Analytical Chemist
Mrs Freida Stack	Consumer
Dr Brian Vernon	Feed Industry

Short biographies of the members are on the VRC website.

What does the committee do?

The committee has formal terms of reference listed below. Broadly, our purpose is making sure that there is independent scrutiny in the surveillance for veterinary residues in the UK. We provide a source of advice for the Chief Executives of the Veterinary Medicines Directorate (VMD) and Food Standards Agency (FSA) on formulating residues surveillance programmes, and the significance of the results for consumer safety.

¹ Dr Brantom was nominated by the Food Standards Agency to advise on food safety and risk assessment.



Terms of Reference

The VRC's terms of reference are:

- to interpret and advise on the incidence and concentrations of residues of veterinary medicines in samples collected under the VMD and FSA's surveillance programmes;
- to assess and advise on the scope and operation of the VMD statutory surveillance programme within the context of the requirements of European Community legislation;
- to advise, with particular reference to food safety, on the VMD non-statutory and ad-hoc FSA residue surveillance programmes and consider the need for further analytical surveys;
- to set up Sub-Groups as necessary to further the work and objectives of the VRC; and
- to publish results as they become available in the VMD's Quarterly Medicines Act Veterinary Information Service; to publish a Veterinary Residues Committee Annual Report on Veterinary Residue Surveillance, which will include detailed results in the context of food safety, to report annually to the Food Advisory Committee² and the Veterinary Products Committee.

How can I comment on the work?

The VRC welcomes your comments. You can send them to the committee either in writing or by e-mail to:

The Veterinary Residues Committee,
Woodham Lane,
New Haw,
Addlestone,
Surrey, KT15 3LS.

Secretariat@vet-residues-committee.gov.uk

Our purpose is making sure that there is independent scrutiny in the surveillance for veterinary residues in the UK.

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². The Food Advisory Committee ended in 2001.

The VRC's First Year

The VRC want people to understand the work of the committee and the surveillance schemes.

The committee came into being in January 2001. At the start of the year there were presentations to the members to allow us all to become familiar with the subject. Three full meetings of the VRC were held during the year. As well as the VRC members and the Secretariat, provided by the VMD, a number of advisors have attended the meetings, they are named in the minutes of each meeting. The advisors, while not members of the VRC, were able to provide expertise at the committee's request on issues relating to their parent bodies. Organisations that provided advisors during the year were:

- Department of Agriculture and Rural Development, Northern Ireland (DARD);
- Food Standards Agency (FSA);
- DEFRA's State Veterinary Service (SVS); and
- Veterinary Medicines Directorate.

The committee addressed a number of issues during the year:

Reviewing the results

At each of the three full VRC meetings, the committee reviewed the results of the UK surveillance schemes and the members were able to ask detailed questions of the advisors and request extra information on causes and follow-up actions. The committee then advised the VMD on the actions they may wish to take.

Planning the surveillance schemes

VRC members have been actively involved in planning the VMD's surveillance programmes for 2002. Freida Stack and Professor Keith Anderson attended the National Surveillance Scheme planning meeting to help produce the 2002 plan. The VRC set up a sub-group to advise the VMD on the strategy and operation of their Non-Statutory Surveillance Scheme; this work is reviewed later in this report.

Communicating the work of the committee

The committee set up a sub-group to look at how to communicate its work. The VRC want people to understand the work of the committee and the surveillance schemes. We see it as crucial for the public to have confidence in the system, that the information that they want is available in language that they understand. The communications sub-group's work is reported on page 9.

Residues originating from Feed Additives (such as nicarbazin)

The committee has set up a sub-group to work towards reducing residues of specific veterinary medicines present in some animal feeds. Their work can be found later in this report.

Residues of Chloramphenicol in prawns from SE Asia

Towards the end of the year, the committee received reports of prawns containing residues of chloramphenicol. Chloramphenicol is banned from use in food producing animals in the EU. It can cause aplastic anaemia, a rare but very serious condition.

We advised that extra samples of prawns from SE Asia be collected for analysis. The VMD agreed and 45 extra samples of warm-water prawns were collected from shops and various suppliers. The results are included in table 3 on page 27.

Brand naming

The Food Standards Agency has been very keen for the VMD to operate brand naming in their surveys – this is where the shop from which a sample of food containing an unacceptable residue was bought is named. The statutory nature of the NSS does not allow the naming of producers. The VRC are, in principle, in favour of brand-naming for the Non-Statutory Scheme. The committee has agreed to complete the review of the Non-Statutory Scheme and then look at how brand naming might be applied fairly.

Malachite green

This dye is not an authorised medicine, but has been used by fish farmers in many countries to treat infections, as there have been few alternatives. As it is not an authorised medicine, its safety has not been established (see results and conclusions). The committee expressed its concerns about the continuing presence of residues in farmed fish.

FSA stakeholders meeting on feed additives

Members of the VRC were invited to chair sessions and give presentations at the FSA stakeholders meeting on residues originating from certain animal feed additives. Professor Jim Bridges was invited to chair a session on informing stakeholders of the results of surveillance. Dr Paul Brantom, was invited to chair the session on a joint VRC and industry action plan to reduce residues in poultry and Dr Brian Vernon was invited to explain the plan. Mrs Dorothy Craig was invited to talk on the VRC's views on the surveillance programmes and how to present results in the future.

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Members of the VRC were invited to chair sessions and give presentations at the FSA stakeholders meeting on residues originating from certain animal feed additives.

Non-Statutory Planning Sub-group.

The sub-group are keen that the planning process for the Non-Statutory Scheme is transparent and that the choices they make will be for reasons all can understand.

This was set up to provide advice on the strategy and operation of the Non-Statutory Scheme. The members are:

Professor Jim Bridges Chairman

Professor Keith Anderson

Professor Julie Fitzpatrick

Dr W John McCaughey

Mrs Freida Stack.

The sub-group met once in 2001³. The members are keen that the planning process for the Non-Statutory Scheme is transparent and that the choices they make will be for reasons all can understand. The sub-group considered:

- **sources of intelligence** – to whom could the committee look for information on possible residue issues;
- **areas of concern** – where should the committee prioritise its effort;
- **sources of samples** – are there other sources of samples which would be more effective in providing information on residues;
- **residues to be analysed for** – how to decide which veterinary medicine residues should be included;
- **foods to be analysed** – how to decide which foods should be included in any particular year; and
- **statistically significant sampling** – sufficient samples need to be taken to be statistically valid.

The outcome of these discussions, and in particular our advice to move towards including more imported produce, was reflected in the VMD's 2002 plan for the Non-Statutory Scheme, within the constraints of the budget available.

3. The report of the meeting can be found in the VRC website as meeting paper VRC/01/24.

Communications Sub-group



The VRC want people to have confidence in their work. For this, we want to provide the information that is important to people in everyday language that they can understand. A sub-group was set up to look at how the committee could best achieve this. The members are:

Mrs Dorothy Craig Chairperson

Mr John Ambrose

Dr Paul Brantom

Mr Neil Cutler

Mrs Freida Stack.

The sub-group met once in 2001⁴. It considered the VRC website, the Annual Report and designs for letter headed notepaper.

The sub-group concluded that the website should be easy to use for all people. They requested that the VRC website should be further developed to follow the Plain English Campaign and the Royal National Institute for the Blind's '*Website Guidelines*'. '*Bobby*' Software⁵ was used to check that the maximum number of people would be able to use the VRC website.

The sub-group also considered the style and content for this report and made recommendations to the full committee. The sub-group recommendation was for a shorter easy-to-read report that focussed on the most important results; this was approved by the VRC.

The VRC want people to have confidence in their work. For this, we want to provide the information that is important to people in everyday language that they can understand.

4. The report of the meeting can be found in the VRC website as meeting paper VRC/01/26

5. '*Bobby*' is a website assessing programme that checks how easy a site is for people with disabilities to use. It can be found at www.cast.org/Bobby/

Feed Additives Sub-group

At the first VRC meeting in April 2001, the committee agreed to set up a sub-group to recommend strategies to reduce the residues of nicarbazin, lasalocid and dimetridazole that sometimes occur in poultry, quail and in what should be unmedicated animal feed.

Medicinal compounds, such as nicarbazin, may be added to animal feed to treat a large number of birds at once. If either the mill producing the feed or the farm does not follow best practice, it can lead to elevated residues in what was bought as unmedicated feed, and/or in the birds or their eggs.

The group consisted of:

Dr Brian Vernon Chairman

Mrs Dorothy Craig

Dr Keith Lawrence

Dr Paul Brantom

A broad cross-section of feed and poultry industry representatives, the FSA, DARD NI and the VMD attended the first meeting on 22 June. There was good support for addressing the problems and an *'Industry Action Plan'* was agreed. This was reported to the full VRC in meeting papers VRC/01/12 and 25.

A second meeting was held on 17 December (reported as VRC/02/12). This meeting was again well-supported by industry.

The members of the sub-group accepted invitations to make presentations at the FSA's Stakeholder meeting on 16 January 2002, where the use of nicarbazin and other feed additives would be discussed.

Overview of Surveillance for Veterinary Residues



Why test foods?

The purpose of the surveillance schemes is to check that we are not exposed to unacceptable residues of animal medicines. In practice this means looking for authorised medicines, checking that MRLs are not exceeded and for residues of unauthorised substances. If any problem areas are highlighted, the VRC advises on actions to reduce these.

Medicines are a part of animal husbandry

We know that animals can become ill. So, from time to time they will need to be treated with medicines to prevent them suffering unnecessarily. This is part of normal animal husbandry for all stock farms, including those working to organic standards. But, when we buy foods of animal origin, we expect that any residues present are at concentrations that do not carry a risk to our health.

Surveillance, as part of the regulatory system for veterinary medicines, checks that our food is safe⁶.

What Surveillance is carried out in the UK?

EC Surveillance

The majority of the surveillance that the VRC advise on, is done as part of the National Surveillance Scheme (NSS) of UK produced foods. This scheme covers the red meat, poultry, wild and farmed game, farmed fish, milk and egg industries. Samples are collected mainly from farms and abattoirs. The NSS fulfils the UK's obligations under European law (Council Directive 96/23 EC).

The Directive lays down broad parameters on the number of samples and the compounds to be analysed for. The number of samples is a fixed proportion of the forecast production for the particular sector of industry.

The plan for 2001 had already been produced when the VRC was set up. But for 2002, the VRC discussed and advised on the plan, which was produced by the VMD after consultation with representatives from the VMD, LGC, FSA, DEFRA and DARD NI. The plan was then submitted to the European Commission and the other Member States for them to discuss and approve.

In 2001, some 39,000 samples were collected from farms, abattoirs and egg packing stations from across the UK and some 44,000 analyses were performed.

Other Surveillance

There is also a Non-Statutory Scheme which looks at imported and processed foods. It gives valuable information on foods that do not fall within the NSS. The samples are collected from shops and at the Border

The purpose of the surveillance schemes is to check that we are not exposed to unacceptable residues of animal medicines.

From time to time animals will need to be treated with medicines to prevent them suffering unnecessarily. This is part of normal animal husbandry for all stock farms, including those working to organic standards.

The National surveillance Scheme covers the red meat, poultry, wild and farmed game, farmed fish, milk and egg industries.

In 2001, some 39,000 samples were collected and some 44,000 analyses were performed.

6. How the surveillance schemes fit into the regulatory process is shown on pages 18 and 19.

Inspection Posts. The VRC has set up a planning sub-group to advise on the future strategy and operation of this scheme (see page 8).

In 2001, some 1,432 samples were collected and 7,787 analyses completed.

Some non-government organisations involved in food production and sale carry out their own surveillance. Although the full committee have not considered these results, they have been included in the report on page 29 to give consumers a fuller picture of the incidence of residues in food.

Costs

The NSS in GB cost £3.6m in 2001. This was paid for by a levy on each of the relevant industry sectors, in accordance with Council Directive 96/43 EC. DEFRA paid the £750,000 cost of the Non-Statutory Scheme.

Results

This report gives a summary of the most significant results, but all the results are available on the VRC and VMD websites⁷; paper copies are available on request to the secretariat. Summary results are also published quarterly during the year in the VMD's *Medicines Act Veterinary Information Service* newsletter (*MAVIS*) and updated regularly on their website in *MAVIS-on-line*.

All the results are available on the VRC and VMD websites.

7. The VMD's website address is www.vmd.gov.uk
The VRC's website is www.vet-residues-committee.gov.uk

Maximum Residue Levels, Action Levels and Differential Action Levels

These terms are used to describe concentrations of residues, which, if present or exceeded, trigger a follow-up investigation, which is arranged by the VMD.

Maximum Residue Level – when a medicine is submitted for authorisation, its active ingredient must have been evaluated for safety. In Europe, the Committee for Veterinary Medicinal Products (CVMP), part of the European Medicines Evaluation Agency, does this. They will set a concentration that they consider, having reviewed all the available evidence, will not represent a health risk to consumers.

How the process works and fits into surveillance is described later in the report.

Action Level – some compounds do not have an MRL, for example those whose use has not been authorised in the EC. For most of these, the Action Level will be that their presence has been confirmed at any concentration in a sample. Examples of residues that fall into this category are: hormones, β -agonists and Annex IV compounds (see glossary).

Differential Action Level – other compounds, although authorised, do not have an MRL currently. This is because they are of low priority in terms of human health significance. Nicarbazin in eggs is an example. In 1998, the AGVR set a Differential Action Level, or DAL, for nicarbazin in eggs of 100 $\mu\text{g}/\text{kg}$ as representing no threat to human health. Subsequently they applied this to lasalocid. This was done so that the VMD would not automatically have to follow-up samples with low concentrations of these residues.

How does the National Surveillance Scheme work in Great Britain?

1. The basis for the scheme is European Directive, 96/23 EC.

Annexes to this Directive set down the number of samples that EC Member States must take in each livestock industry sector, based on forecast production. The annexes also set down the groups of chemicals that must be looked for.

2. Planning the programme

The VMD get together interested parties, such as the VRC, FSA, SVS, EMI, DARDNI and CEFAS, to discuss the particular compounds in each group they should analyse for. They also discuss how many samples should be taken.

3. The plan must be approved in Brussels

Officials from the European Commission (DG-SANCO) and all of the Member States examine the plan to ensure it complies with the Directive.

4. The VMD puts the plan into action

The plan is entered onto the 'Residues in Meat' (RIM) database. This is the key database that allows the VMD to track the progress of samples and have an audit trail back to the producers. The database is used to generate sample requests. This is done in a way so that all registered abattoirs should have some samples taken each year in normal circumstances. Samples are also targeted toward producers that have had 'positives' in the past and where particular problems are suspected.

5. Samples are collected

The officers of the different services collect the samples. They are taken in the course of the officers' other duties. For example, the MHS will have officers at all abattoirs for meat hygiene checks; they will take samples when requested, or if they have suspicions about an animal. The SVS routinely visit farms for a number of reasons and can include sample collection at any time. So producers cannot be sure when a sample or samples are to be taken from their animals or premises.

6. What constitutes a sample?

A sample will vary depending on the compound and species. We look where we are most likely to find a residue. This will often mean a portion of liver or kidney of an animal, but could involve collecting blood, urine, faeces or the retinas of animals. A dozen eggs constitute one egg sample.

7. Samples are sent to the laboratory

The sealed samples are sent to the analytical laboratory, the Laboratory of the Government Chemist, where they are entered onto the computer system. This ensures that we can monitor the progress of the samples and have an audit trail back to the producer.

We look where we are most likely to find a residue. This will often mean a portion of liver or kidney of an animal, but could involve collecting blood, urine, faeces or the retinas of animals

8. The samples are analysed

The laboratory will normally perform a screening test to see if the particular residue or residues are present. If they detect a residue, the sample will then be subject to a confirmatory analysis to give a definitive result.

9. The results are assessed

The results are presented at the VRC meetings during the year. This allows members to comment and ask questions. All the results that are above the relevant MRL or Action Level are also seen by the FSA. They can give a scientific opinion on the significance for human health.

10. Follow-up investigations

The severe Foot and Mouth Disease outbreak reduced the number of follow-up investigations this year (see below).

In normal years, a follow-up investigation would be carried out into every sample with a residue above the relevant MRL or Action Level. This tries to find the cause of the residue and gives help to the farmer in avoiding residues in the future.

If there is suspicion that the farmer has used a banned substance, or if a particularly high concentration of an authorised medicine has been found, an Investigation Officer of DEFRA's Legal Department will be present when the farm is visited. Where there is sufficient evidence, a prosecution is considered.

11. Results are available to everyone

The reports updating the committee are, of course, put on the VRC website. You can also find the results in the VMD's quarterly 'MAVIS' newsletter and they are regularly updated on their website in 'MAVIS-on-line'. At the end of the year all of the results are posted on the VMD and VRC's internet sites.

All the results that are above the relevant MRL or Action Level are also seen by the FSA. They can give a scientific opinion on the significance for human health.

The Effect of Foot and Mouth Disease

During 2001, we saw the biggest ever Foot and Mouth Disease outbreak in GB. Fighting the disease was DEFRA's highest priority. Visits to farms for other purposes were kept to a minimum to reduce the possibility of spreading the disease. This policy affected the Statutory Surveillance Programme:

- the SVS were not able to collect samples from farms for analysis;
- nor were they able to carry out most of the follow-up investigations that they would normally undertake when residues above the relevant MRL or Action Level had been detected.

What steps were taken because of this?

The VMD transferred the sampling carried out on farms to abattoirs. MHS staff were asked to collect extra samples to cover the areas lost from the on-farm sampling. And their efforts helped to ensure that the plan for 2001 was met. The VRC took a close interest in the issue and contributed to the discussions on the VMD's actions to meet the plan.

Were any follow-up investigations carried out?

For residues of the most concern, such as possible illegal use of hormones, the SVS did carry out investigations. For others, the VMD wrote to the producers concerned to give advice and remind them of their obligations. The VMD also indicated that they could take further action later, if necessary.

How does the Non-Statutory Scheme work?

We have mentioned that the Non-Statutory Scheme looks at imported and processed foods and provides additional safeguards for consumers. The foods to be analysed were originally chosen with reference to the National Food Survey's tables of consumption. But, the VRC are currently reviewing the strategy and operation of the scheme (see page 8).

The samples for this scheme are analysed at the Central Science Laboratory in York. Where positives are found, the VMD tells the retailer of any 'positive' samples bought from their stores. If the foods were imported, DEFRA's Chief Veterinary Officer is informed. He will write to his opposite number in the country concerned and ask them to look into the cause of the residue.

All of the results of the Non-Statutory Scheme are reported in 'MAVIS' and on the VMD and VRC websites in the same way as for the National Surveillance Scheme.

The VMD transferred the sampling carried out on farms to abattoirs. MHS staff were asked to collect extra samples to cover the areas lost from the on-farm sampling.

All of the results of the Non-Statutory Scheme are reported in 'MAVIS' and on the VMD and VRC websites in the same way as for the National Surveillance Scheme.

Who is involved in the UK's Surveillance for Veterinary Residues?

The Veterinary Medicines Directorate operates the surveillance programmes and provides the secretariat for the VRC, but many other organisations have a role:

- **Border Inspection Posts (BIPs)** – staff at the BIPs collect samples of imported foods for analysis under the Non-Statutory Scheme.
- **British Market Research Bureau (BMRB)** bought samples of foods from shops for the Non-Statutory Scheme in 2001.
- **Central Science Laboratory, York (CSL)** – analyses samples collected under the Non-Statutory Scheme.
- **Centre for Environment, Fisheries and Aquaculture Science (CEFAS) of DEFRA** – collect samples for the National Surveillance Scheme (NSS) and carry out follow-up investigations on fish farms in England and Wales.
- **Commission of the European Union** – in conjunction with the other Members States they examine and have to approve all the National Surveillance Plans from around Europe.
- **Department for Agriculture and Rural Development, in Northern Ireland (DARD)** – collect and analyse samples for the NSS in Northern Ireland on behalf of the VMD and conduct their own surveys; these are included in this Annual Report. DARD also carries out follow-up investigations in NI, and attend the VRC as advisors.
- **Egg Marketing Inspectorate (EMI) of DEFRA** – collect samples of eggs from packing stations for the NSS.
- **Fisheries Research Services (FRS) of the Scottish Executive** – collect samples under the NSS and carry out follow-up investigations on fish farms in Scotland.
- **Food Standards Agency (FSA)** – advises on the significance of the results of the Surveillance Schemes and also attend the VRC meetings as advisors.
- **Laboratory of the Government Chemist, Teddington (LGC)** – analyse samples collected under the NSS.
- **Legal Department of DEFRA** – prepare the national legislation in GB to enable the VMD to run the National Surveillance Scheme. One of their investigation officers will carry out follow-up investigations where very high concentrations of an authorised substance are found or the use of unauthorised substances is suspected. DEFRA's lawyers, in consultation with the VMD, will also decide if there is enough evidence to take a prosecution.
- **Meat Hygiene Service (MHS) of the FSA** – collect NSS samples from abattoirs, they also have powers to detain animals that they suspect have been treated with unauthorised substances or contain residues above the Maximum Residue Limit.
- **Royal Pharmaceutical Society of Great Britain (RPSGB)** – carry out inspections of feed mills that produce medicated feed. These can be for either the National or Non-Statutory Schemes.
- **State Veterinary Service (SVS) of DEFRA** – collect NSS samples from stock farms in Great Britain, and carry out follow-up investigations for samples above the MRL or Action level. Their staff also attend the VRC meetings as advisors.

The UK's Surveillance Schemes as part of the Regulatory Process for Veterinary Medicines

The UK's surveillance schemes are part of the regulatory process for veterinary medicines. The schemes are a check that veterinary medicines are being used as they should and that any residues are at acceptable concentrations.

Understanding the regulatory process for veterinary medicines can help us put the results of surveillance in context. Central to the process is that the use of veterinary medicines should not result in any consumer exceeding the Acceptable Daily Intake, or ADI.

Who Sets Maximum Residue Limits

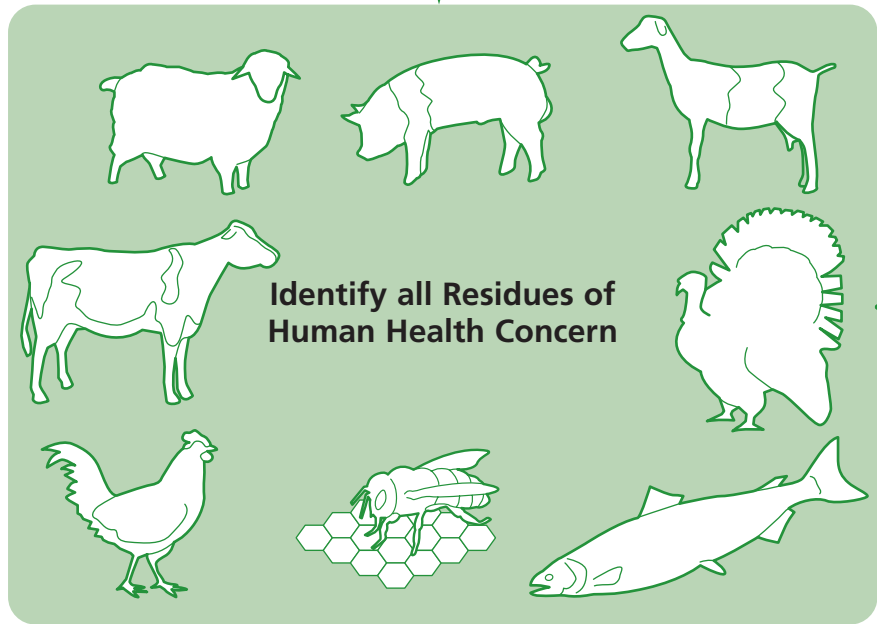
International Committees of scientific experts set MRLs.

In Europe, the Committee for Veterinary Medicinal Products (CVMP) assess safety data to set MRLs. The CVMP is part of the European Medicines Evaluation Agency.

The Joint FAO/WHO Expert Committee on Food Additives (JECFA) also set MRLs. JECFA is an international expert scientific committee that is jointly administered by the Food and Agriculture Organisation of the United Nations and the World Health Organisation.

Set the Acceptable Daily Intake (ADI) for the Active Substance

the amount we may eat each day without harm



Set Maximum Residue Limits for Each Tissue

such that the ADI is not exceeded

Set Withdrawal Periods for the Medicine

to make sure any residues are below the relevant MRL

Analyse Samples of Foods

the UK's surveillance schemes check that MRLs are not exceeded – action is taken where they do

Setting the Acceptable Daily Intake

International regulatory bodies assess data from a wide range of short and long-term studies. From these, they identify a concentration that had no effect in any of the studies – the ‘No Observed Effect Level’ or NOEL. This concentration is then divided by a safety factor, typically 100-1000, to allow for possible differences between species and individuals.

This concentration is the Acceptable Daily Intake, or ADI. This is the amount of a residue that is considered safe for a person to eat every day over a lifetime.

Identify Residues of Human Health Concern

Different species of animals may be treated with a particular medicine. Also, each might convert the active substance in the medicine to other compounds, called metabolites. The regulatory process takes account of this.

Setting Maximum Residue Limits (MRLs)

The ADI is divided among all the edible tissues, taking account of:

- how much of a particular food may be eaten each day;
- how much of the substance occurs in each food;
- how much the substance is changed in the animal’s body; and
- other possible sources of residues, as some substances are used as pesticides or human medicines.

MRLs are set so that even if **all** of the foods contain residues at the respective MRLs, the ADI will not be breached. In practice, residues are not found in most foods that are tested.

Setting Withdrawal Periods

This is the length of time that must pass after the end of treatment with a medicine before that animal or animal product goes for human consumption. It is set for each product that contains the active substance so that the residues in each food will be below the relevant MRL.

Analyse samples of foods – the residue surveillance schemes

We have seen that the regulatory process sets conditions on the use of medicines. When these are followed, any residues will be at concentrations that are very unlikely to pose a health risk to consumers.

The UK’s surveillance schemes check that any residues are indeed below the MRLs that the regulatory authorities have set. Where a residue at a concentration greater than the relevant MRL is found, the cause is investigated and action taken.

Acceptable Daily Intake or ADI

– is an estimate of the amount of a substance, expressed on a body-weight basis, that can be ingested daily over a lifetime without appreciable health risk.

Maximum Residue Limit or MRL

– is the maximum concentration of a residue that is legally permitted or acceptable in or on a food. It is expressed in µg/kg of that food. When proposing MRLs, the ADI must not be exceeded after considering intake from all sources.

No Observed Effect Level or NOEL

– is the highest concentration of an active substance that was found to have had no effect in a safety test.

Veterinary Hypothetical Diet

– in setting MRLs, the amounts of particular foods in our diet are taken into account. The upper quantities of foods that we are assumed to eat are each day are:

- 100g liver
- 50g kidney
- 300g muscle
(muscle and skin for fish)
- 1.5 litres of milk
- 50g fat
(fat and skin for pork and poultry)
- 100g of egg
- 10g honey

Withdrawal Period

– is the length of time after the end of treatment with a veterinary medicine that must pass so that any residues in edible tissues will have depleted to below the MRL. The CVMP can set these or the particular national approvals authority, which for the UK is the Veterinary Products Committee.

Types of Compounds Analysed For in the National Surveillance Scheme

Not all compound types are analysed for in every industry sector. For example, looking in honey for compounds that promote growth in beef cattle or pigs would not be sensible. Below is a table of the types of compounds that are sought in the different sectors. Full details of the individual residues that are sought for each sector are listed on the VMD website.

Table 1. Different groups of compounds are looked for in the different industry sectors.

Type of compound as listed in Directive 96/23 EC	Industry Sector						
	Eggs	Farmed fish	Game	Honey	Milk	Poultry	Red meat
Hormones		X	X			X	X
Gestagens							X
β-agonists			X			X	X
Annex IV compounds	X	X	X		X	X	X
Antimicrobial screen ¹	X	X	X	X	X	X	X
Sulphonamides ¹	X	X			X	X	X
Tetracyclines ¹		X		X	X	X	X
Streptomycin ¹				X			
Thiamphenicol						X	
Quinalones		X			X	X	
Anthelmintics	X	X	X		X	X	X
NSAIDS						X	X
Coccidiostats	X		X			X	X
Thyrostats			X			X	X
Dexamethazone/ Betamethazone ²							X
Carbadox*							X
Sedatives							X
Pesticides and PCBs	X	X	X	X	X	X	X
Heavy metals		X	X	X	X	X	X
Mycotoxins		X		X	X	X	X
Malachite/Leucomalachite green		X					

¹A general screening method tests for antimicrobial compounds and there are also specific tests for sulphonamides, tetracyclines and streptomycin.

² These compounds are not specifically listed under Directive 96/23 EC. But because of concerns about possible use in the past, they are included in the surveillance.

Foods analysed under the Non-Statutory Surveillance Scheme



Some foods, such as baby foods, are sampled every year, while others are sampled in some years and other foods are substituted in other years. The foods sampled in the 2001 programme were:

- Baby food chicken
- Baby food lamb
- Baby food pork
- Bacon
- Corned beef
- Ham
- Pâté
- Raw beefburgers / Raw beef sausages
- Raw pork sausages
- Imported raw beef
- Imported raw chicken
- Imported raw lamb
- Imported raw pork
- Imported raw turkey
- Imported salmon
- Imported trout
- Tilapia
- Warm fresh water prawns
- Warm sea water prawns
- Prawns (additional to the original plan*)
- Honey (imported)
- Goats' milk
- Quail eggs
- Quail meat
- Rabbit.

Not all foods were analysed for all the compounds in the scheme. On grounds of cost, the analyses carried out on a particular food have to be prioritised. This process is one that the VRC has set up a sub-group to examine. There is a note of the approach the sub-group has recommended in this report (see page 8).

* The VRC received reports of chloramphenicol residues in imported prawns after the 2001 plan had been agreed. We requested that the VMD seek additional funds to take extra samples for analysis. As a result, an extra 45 samples were collected and analysed for this antibiotic. The results are on page 27.

Some foods, such as baby foods, are sampled every year, while others are sampled in some years and other foods are substituted in other years.

We requested that the VMD seek additional funds to take extra samples for analysis. As a result, an extra 45 samples were collected and analysed for chloramphenicol.

New Approach to Presenting the Results

We have described how the regulatory system for veterinary medicines sets limits for the concentrations of a residue. As long as a residue is below these limits, it can be considered safe. Where a residue is found to exceed the individual MRL, toxicological advice is taken on a case-by-case basis.

In previous reports, all the results were included. While this was complete, the VRC consider that it made it more difficult to focus on the results that need to be considered more closely. So, for the first VRC Annual Report, we have presented only the results that are above the relevant MRL or Action Level.

Of course, **all** the results are available from the VRC and VMD websites, or by request from the Secretariat. They are in the same format as the VMD's Annual Report on Surveillance for Veterinary Residues. This is to allow easy comparison between the results of different years.

We would like to know your views on the new approach to the results. Are they easier to use? Are there any improvements you would like to see? You can either write to us, or send an e-mail to secretariat@vet-residues-committee.gov.uk. We look forward to receiving your comments.

Of course, all the results are available from the VRC and VMD websites, or by request from the Secretariat.

We would like to know your views on the new approach to the results. You can either write to us, or send an e-mail to secretariat@vet-residues-committee.gov.uk.

National Surveillance Scheme – Significant Findings

Table 2. National Surveillance Scheme 2001 – Residues Above the MRL or Action Levels

Matrix [†]	Analyte	Number of samples analysed	MRL where set (µg/kg)	Number above the MRL/ Action Level	Concentration detected above the MRL/Action Level (µg/kg)
Salmon muscle	Ivermectin	171	Not set	1	19
	Organochlorines	84	Not set	4	11,17 Dieldrin 10,11, 12, 17 p,p' DDE
	Leucomalachite green	30	Not set	6	4, 5(4), 17
Trout muscle	Organochlorines	10	Not set	1	15 p,p' DDE
	Leucomalachite green	69	Not set	11	2(2), 4, 5(5), 12, 23, 25
Deer kidney SH	Cadmium	27	1,000	13	1,000, 1,100(2), 1,300(2), 1,400, 1,500, 2,200, 2,600(2), 2,800, 3,900, 16,400
Milk	Avermectins	517	Not set	1	40 ^a
Broiler kidney SH	Antimicrobial screen	1,000	Various	3	1,100, 1,200, 1,300 CTC
Broiler liver SH	Nicarbazin	210	200	35	240(2), 260, 270(3), 280, 300, 310(2), 340, 350, 360(2), 380, 390, 410, 430, 560, 730, 750, 770, 830, 900, 920, 960, 970, 1,100, 1,800(2), 2,000, 2,200, 2,400, 2,500, 3,300
Broiler liver SH	Carbamates	60	Not set	1	93 - propoxur
Hen kidney SH	Antimicrobial screen	19	Various	1	1500 - CTC

Matrix [†]	Analyte	Number of samples analysed	MRL where set (µg/kg)	Number above the MRL/ Action Level	Concentration detected above the MRL/Action Level (µg/kg)
Turkey kidney SH	Antimicrobial screen	517	Various	14	620, 650, 660, 830(2), 860, 870, 980, 1,100(2), 1,200, 1,400, 2,200 - CTC 480 - Tylosin
Turkey kidney SH	Tetracyclines	94	600	2	1,100, 1,200 - CTC
Cattle urine OF	Nortestosterone ^B	19	Not set	4	2, 4(2), 6
Cattle urine SH	Nortestosterone ^B	31	Not set	1	8
Cattle serum SH	Progesterone	178	0.5*	9	0.6, 2(6), 4, 17
Cattle bile SH	Zeranol ^A	301	Not set	17	2(2), 3(3), 4(2), 5(2), 6(3), 7, 9, 12, 14, 20
Cattle retina SH	β-agonists	107	Not set	1	5
Cattle liver SH	Avermectins	331	Various	1	350 - ivermectin
Cattle/calves liver SH	Coccidiostats	41	Not set	2	3, 11- monenesin
Horse kidney SH	Cadmium	8	1,000	8	1,300, 4,700, 5,500, 6,900, 9,100, 9,400, 22,000(2),
Pig kidney SH (Antimicrobial screen)	Tetracyclines	1,469	600	8	620, 740, 800, 810, 820, 830, 880, 1,000,
(Antimicrobial screen)	Sulphonamides	1,469	100	2	270, 320 - SDZ
Pig kidney SH	Sulphonamides	1,187	100	6	170, 190, 410 SDZ, 150, 170, 1,300 - SDM
Sheep bile SH	Zeranol ^A	85	Not set	1	6
Sheep kidney fat SH	Organochlorines	159	Various	1	1,100 - Dieldrin
Sheep kidney fat SH	Organophosphates	746	Various	1	1,700 - Diazinon

Key:

SH = Slaughterhouse, OF = On farm

(n) = the number of samples with this concentration of an analyte

* Action Level

CTC = chlortetracycline,

SDZ = sulphadiazine,

SDM = sulphadimidine

a = screening test result - insufficient sample for confirmatory test

^A = confirmatory analysis showed the presence of fungal metabolites consistent with feed contamination

^B = urine contained a-nortestosterone, however, all were female. Female ruminants can produce a-nortestosterone under normal physiological conditions

† The matrices were chosen as those when any residue present would be concentrated

Where an MRL has not been set, the relevant Action Level is used as the trigger concentration

Advice from the FSA is that none of these 75 VMP residues were of concern for human health.

A total of 155 of the some 44,000 analyses revealed residues above the relevant MRL or Action Level. Some of these, such as cadmium, leucomalachite green and organochlorines are not registered veterinary medicinal products (VMPs). Overall, it is likely that 75 of these 'positives' resulted from the use of VMPs. Advice from the FSA is that none of these 75 VMP residues were of concern for human health.

The residues of leucomalachite green are of concern, as the safety of this compound has not been fully evaluated (see Conclusions).

Eggs

- No residues were detected at concentrations above the MRL or Action Levels.

Farmed Fish

- No PCBs were detected in samples of UK farmed fish.
- One of 171 samples of farmed salmon tested (0.58%) contained a residue of ivermectin at 19 µg/kg. Ivermectin is not authorised for use as a veterinary medicine in salmon and DEFRA's Legal Branch has conducted an investigation.
- Leucomalachite green residues were found in both 6 of 30 salmon muscle samples and 11 of 69 trout muscle samples tested. The residues were present at concentrations of between 4-17 and 2-25 µg/kg respectively (see Conclusions).

Game

- No residues of veterinary medicines were detected at concentrations above the relevant MRLs or Action Levels.
- Residues of cadmium above the MRL were detected in 13 of 27 samples of deer kidney tested.

Horses

- All eight samples of horse kidney tested contained residues of cadmium above the MRL. The committee understands that horse kidney is removed from the carcass and does not enter the human food chain.

Honey

- No residues above the relevant MRLs or Action Levels were detected.

Milk

- A veterinary medicine residue at a concentration above the Action Level was found in only one sample of milk tested. One of 517 samples (0.19%) of milk tested was found in screening analysis to contain residues of avermectin above the Action Level. Unfortunately, there was not enough milk for a confirmatory analysis to be undertaken.

Poultry

- Residues of chlortetracycline above the MRL were detected in broiler, hen and turkey kidney.
- Residues of tylosin above the Action Level were found in 1 of 517 (0.19%) samples of turkey kidney tested.
- Nicarbazin residues above the JECFA MRL of 200 µg/kg continue to be found in broiler liver. The VMD have sent advisory letters and questionnaires to all of the farms from where positive samples originated. The results of these will be given to the Feed Additives sub-group, described earlier.

Red Meat

- Low concentrations of progesterone were found in 9 of 178 cattle serum samples (5.1%). Low concentrations of nortestosterone were also found in 4 of 19 samples of cattle urine collected on farms and 1 of 31 samples of cattle urine collected at slaughterhouses. No evidence of abuse was found on the farms during visits by the State Veterinary Service, or on the basis of resampling these or other animals on the farm of origin. The concentrations of these natural hormones will vary according to the age and physiological state of the animals tested.
- Seventeen of 301 samples (5.6%) of cattle bile tested contained residues of zeranol at concentrations between 2 and 20 µg/kg. The follow-up investigation found no evidence of abuse on the farms. The follow-up investigations also found that the samples contained the fungal metabolite α -zeralenol. Some strains of *Aspergillus* moulds can produce zeranol. From the findings of the investigations, fungal contamination of the feed was concluded to be the cause. This phenomenon has been reported in several other countries.

Because of the Foot and Mouth disease outbreak in 2001, many farmers were forced to keep stock on their farms longer than they intended. This put a strain on animal accommodation and the feed supplies. The VRC would like to see farmers given help and advice over the storage of animal feed, to avoid fungal contamination.

- One of 107 samples (0.94%) of cattle retina was found to contain a residue of a β -agonist at a concentration of 5 $\mu\text{g}/\text{kg}$. No β -agonists were detected in the liver of this animal. Subsequent investigations revealed no evidence of abuse on the farm of origin. The producer will be continue to be subject to targeted surveillance for β -agonists by DARD.
- One of 331 samples (0.30%) of cattle liver tested was found to contain residue of ivermectin at a concentration of 350 $\mu\text{g}/\text{kg}$. An investigation found that this was an injured animal that had gone for slaughter on welfare grounds. The animal had previously been treated and was slaughtered before the end of the withdrawal period. The carcass had been returned to the farmer for his own consumption, so had not been placed on the market.

The FSA advised that they would not wish to see a situation where consumers are exposed to ivermectin at this concentration over a prolonged period. However, they advised that the safety margins built into the safety assessment were such, that the relatively short period over which the liver would have been consumed they judged to be acceptable.

- Eight of 1,469 samples (0.54%) of pig kidney tested contained residues of tetracycline above the MRL; the highest concentration being 1000 $\mu\text{g}/\text{kg}$.
- Two of 1,469 samples (0.14%) of pig kidney were found to contain residues of sulphadiazine in screening tests for antimicrobial compounds. In separate tests, six of 1,187 samples (0.51%) contained residues of sulphonamides above the MRL.

Non-Statutory Scheme – Significant Findings



**Table 3. Non-Statutory Surveillance 2001
– Results over the MRL/Action Levels**

Matrix	Analyte	No. of samples analysed	MRL, where set µg/kg	Number of samples above the MRL/Action Level	Concentration detected µg/kg
Imported salmon	PCBs PCB52 PCB101 PCB118 PCB138 PCB153	10	Not set	2	10 15 11 12, 13 10, 14
Imported trout	PCBs PCB52 PCB101 PCB118 PCB138 PCB153 PCB180	10	Not set	10	12(2), 14, 15, 16, 17(2), 22 18, 29, 31, 37, 40(2), 42, 46, 58 16, 24, 25(2), 27, 32, 36, 39(2) 14, 33, 61, 63, 70, 75, 81, 86, 97, 105 15, 29, 58, 60, 74, 77, 81, 86, 91, 113 13(2), 15(2), 16, 17, 19, 21
Imported honey	Streptomycin	50	Not set	5	84, 100, 130, 160, 210
Imported raw beef	Ivermectin	40	Not set	1	25
Imported raw turkey	PCBs	19	Not set	1	PCB101-29, PCB118-19, PCB138-47, PCB153-52
Pâté	Nicarbazin	30	Not set	1	33
Quail eggs	Lasalocid Dimetridazole/ronidazole	30 20	100* Not set	7 3	210, 240, 330, 410, 550, 630, 740 Dimetridazole 5, 6, 23 2-hydroxydimetridazole 7, 9, 39
Quail muscle	Lasalocid	30	Not set	5	43, 45, 88, 290, 400
Warm fresh water prawns	Tetracyclines	20	100	6	Oxytetracycline 198, 290, 530, 650 Chlortetracycline 230, 240, 300, 420, 460, 660
Prawns additional to the original plan*	Chloramphenicol	45	Not set	2	0.7, 0.9

Where an MRL has not been set, the relevant Action Level is used as the trigger concentration

* The VRC requested that the VMD collect additional samples of prawns following reports of the use of banned substances in SE Asia.

A total of 43 of the some 7,700 analyses revealed residues above the relevant MRL or Action Level. As with the NSS, some of the residues, such as PCBs were not of registered VMPs. Only five of the VMP residues were a cause of concern: the dimetridazole residues in three quail muscle samples and chloramphenicol in two samples of SE Asian Prawns. Neither of these compounds is authorised for these uses in the UK.

Farmed fish

- PCB residues were found in all 10 samples of imported trout and 2 of the 10 salmon samples tested. The trout samples were from Denmark. The supplier has been asked for more details that will be passed to the Danish authorities. The salmon samples were imported from Chile and

China. Details of the consignments have been passed to authorities in these countries. The Chilean authorities have been liaising with the UK over methods of analysis. A method has been passed to them and a contact should they need further help.

Imported Honey

- Residues of streptomycin were found in 5 of the 50 samples of imported honey tested. Honey in the EU may not legally contain streptomycin. However, advice from the FSA is that its presence is not a food safety issue. These samples were collected at the Border Inspection Posts. Three samples were from China and the other two were from Mexico. Details of the samples have been passed to the Chinese and Mexican authorities. And the Chief Veterinary Officer has written to his opposite numbers about investigating the cause of the residues.

Imported raw meat

- Ivermectin residues at a concentration of 25 µg/kg were detected in a sample of imported beef from Uruguay. The Uruguayan authorities are investigating the cause.

Processed meats

- A residue of a veterinary medicine above the MRL/Action Level was found in only one sample of processed meat – nicarbazin residues at a concentration of 33 µg/kg were detected in 1 of 30 pâté samples tested. The sample was imported from France and the supplier has been contacted.

Quail

- Residues of both dimetridazole (DMZ) and 2-hydroxydimetridazole above the Action Level were detected in 3 of 20 samples of quail eggs tested. DMZ is not authorised for use in quail, so these residues are a cause of concern (see Conclusions on page 30).
- Residues of lasalocid above the Action Level were detected in five of 30 samples of quail muscle tested. The FSA has previously advised that at the concentrations detected, the residues would not pose a risk to human health. One of the samples was from Italy and the supplier has been contacted for more information. A UK producer has been contacted over residues in samples taken from their birds and an investigation is underway.
- Seven of 30 samples of quail eggs tested contained residues of lasalocid above the DAL. The most likely cause of the residues was feed contamination, so the RPSGB is carrying out an investigation at the feed mills concerned.

Prawns

- Six of 20 warm-water prawn samples tested for tetracyclines were found to contain residues above the MRL. Five of the samples were from Thailand and one from Bangladesh. DEFRA's Chief Veterinary Officer has contacted the Thai and Bangladeshi authorities about investigating the cause of the residues. The VMD has contacted the retailers and requested follow-up action. The FSA has been informed.
- Of 45 extra samples of prawns collected on the advice of the VRC, 2 were found to contain residues of chloramphenicol. These samples were from Vietnam. The FSA and the importer have been informed and supplied with the relevant information from the audit trail (see Conclusions).

Results from non-government sources

Some non-government organisations involved in food production and sale have submitted results of their own analyses. The committee has not yet considered them, but as the results provide more information on the level of residues present in our food, they are included in the report.

These results are difficult to compare with those of the main UK surveillance schemes, as they were collected from different stages of the food production process and analysed at different laboratories. The laboratories would use a range of methods with different detection limits. Also, the results report only presence or absence of a residue, rather than the concentration.

Table 4. 2001 Results of surveillance from a range of non-DEFRA sources

Matrix	Analyte	No of samples analysed	No residue detected	Residue detected
Cattle kidney	Antimicrobial screen	2831 ^a	2,826	5 ^b
Cattle urine	β-agonists	2831 ^a	2,831	0
	Diethylstilboestrol	2831 ^a	2,831	0
	Ethinylestradiol	2831 ^a	2,831	0
	Trenbolone	2831 ^a	2,831	0
Lamb kidney	Antimicrobial screen	1,856	1,852	4 ^b
Pig kidney	Antimicrobial screen	7,856	7,828	28 ^b
Salmon	Antimicrobial screen	7	7	0
	Ivermectin	9	9	0
Sea bass	Leucomalachite green	6	6	0
	Malachite green	6	6	0
Sea bream	Leucomalachite green	6	6	0
	Malachite green	6	6	0
Trout	Leucomalachite green	6	6	0
	Malachite green	6	6	0

^a Non-UK sourced cattle under 3 years.

^b Positive by antimicrobial screen (Modified Four Plate Technique Screen).

Conclusions from Surveillance for Residues in the UK in 2001

No UK authorised use of a Veterinary Medicinal Product resulted in a residue which would give cause for concern for human health.

Conclusions

No UK authorised use of a Veterinary Medicinal Product resulted in a residue which would give cause for concern for human health. The full set of results for 2001 can be found on the VRC and VMD websites. In keeping with previous years these are set out by sector and give a full breakdown of all the matrix/analyte combinations tested. From these results readers can check how many samples were tested, and how many proved positive. We can conclude from these results that the UK system of authorising and post-authorisation surveillance for veterinary medicines is working correctly and consumers are being protected. However, there are still cases of residues of compounds not authorised for the particular use in the UK that were of potential concern:

- dimetridazole in quail eggs;
- chloramphenicol and other unauthorised substances in foods of animal origin from China and other countries in SE Asia; and
- leucomalachite green residues in farmed fish.

Dimetridazole in Quail eggs

Dimetridazole is not permitted for use in quail in the UK. The quail producer concerned has indicated that they have never knowingly used dimetridazole on their farms. They have changed feed manufacturers in the past because of such problems. The producer has kept samples of feed and has co-operated with the RPSGB's investigation.

Analysis of these feed samples revealed residues of dimetridazole. So, the source of the residue in the quail eggs was contaminated feed. The RPSGB investigated the equipment and manufacturing records of the mill that had supplied the feed. They identified a feed elevator and a piece of equipment that crumbles the feed small enough for quail as the most likely sources of the contamination. The mill has been advised on cleaning procedures and extra carry-over sampling to eliminate the possibility of cross-contamination of feed.

Chloramphenicol and other unauthorised substances from SE Asia

The VRC asked the VMD to carry out extra sampling because of reports of banned substances being detected in prawns from SE Asia. The VMD were able to secure extra funds and tested 45 more samples than were in the original plan.

Analysis found residues of chloramphenicol – an Annex IV substance. This compound is banned in the EC for food producing animals. Chloramphenicol can cause aplastic anaemia, a very serious disorder. The FSA have been informed of the findings and the VRC is concerned that all necessary actions are taken.

The VMD wrote to the processor of the positive samples informing them that the FSA had advised that the stock that they were holding should be destroyed. Also, all future consignments should be tested prior to use. If chloramphenicol residues were to be found, then the consignment should also be destroyed.

Leucomalachite Green residues in farmed fish

Malachite green has never been authorised as a veterinary medicine for use on farmed fish. In the absence of effective authorised medicines, fish farmers in many countries have used malachite green to treat fish diseases. The safety of malachite green and its metabolite leucomalachite green have not been fully evaluated, though long-term studies are underway in the USA.

DEFRA and the fish farming industry have supplied research funds to help develop an alternative. Once a suitable alternative is found, the VRC would then like to see the use of malachite green stop and the incidence of any residues decrease⁸.

Work for the VRC in the coming year

The VRC will want to closely monitor the position over the unauthorised uses that we have described above and any others that come to our attention. In addition, the VRC sub-group on residues from feed additives will continue its work. Although the FSA has advised that nicarbazin and lasalocid residues are not of human health concern, they continue to be concerned about their presence. The incidence of these residues indicates that some farms or feed mills are not following best practice. We welcome the industry's support for the initiative.

The sub-group advising on the planning of the Non-Statutory Scheme will also continue to advise on how to ensure that the scheme makes the best use of the resources available to it.

8. Editors Note

An alternative to Malachite Green is available. A provisional marketing authorisation has been granted for Pyceze, a medicine based on bronopol. Once enough data on how effective the new product is against fish diseases have been gathered, a full marketing authorisation can be considered. The VRC welcome the steps the VMD, DEFRA and SEERAD are taking to stop all use of Malachite Green on fish farms in the UK.

Glossary

ACTION LEVEL – This is the concentration of a residue in an animal product that will spark a follow-up investigation. Where a Maximum Residue Limit is set, this is the concentration used. Where no MRL has been set, the Limit of Quantification (LOQ) is used. But, if a substance has been entered into Annex IV of Council Regulation (EEC) No. 2377/90, any confirmed residue will be reported as in excess of the Action Level.

AGVR – The Advisory Group on Veterinary Residues was the committee that advised the VMD on its surveillance programmes before the Veterinary Residues Committee was formed.

ANALYTE – A compound in a test sample, the presence of which has to be detected and/or quantified.

ANNEX IV – the active ingredients of veterinary medicines used in food producing species must be assessed for safety and allocated to one of Council Regulation 2377/90 EC's annexes. Annex IV indicates that on safety grounds, no MRL can be set. Compounds in Annex IV may not be administered to food-producing animals.

ANTHELMINTICS – Anthelmintics kill and control internal parasites such as liver fluke, tapeworms and roundworms and are used to treat disease caused by parasitic worm infestations.

ANTIMICROBIALS, INCLUDING ANTIBIOTICS – are compounds, which, at low concentrations, exhibit selective toxicity towards micro-organisms. Antimicrobials are used on farms to treat and prevent diseases, such as mastitis and foot rot, caused by micro-organisms.

β-AGONISTS – A group of veterinary medicines that, as muscle relaxants, can be used in animals to aid calving and in humans to treat asthma. β-agonists, such as clenbuterol and salbutamol, have been used illegally at much higher concentrations as growth promoters, where they result in a higher proportion of lean meat. These illegal higher concentrations can in some people result in increased pulse rate, palpitations or flu-like symptoms.

COCCIDIOSTATS – Products that control coccidiosis, a protozoal disease that can cause diarrhoea and dysentery. Control of this infection is particularly important in the poultry industry where the prophylactic use of coccidiostats prevents the disease from developing.

DAL – Differential Action Level: Level agreed by the AGVR as a guideline below which there is no toxicological risk to the consumer. In 1997 the VMD set up an ad-hoc group of consumer, industry and retail representatives to consider the incidence and concentration of nicarbazin residues in eggs and to try to develop strategies to reduce them. The group agreed that the concept of a "Differential Action Level" should be recommended to the AGVR. This was so that the VMD would not automatically follow-up a number of "positive" results which did not pose a toxicological risk to the consumer. In 1998 the AGVR endorsed the proposed DAL for nicarbazin in eggs at 100 µg/kg as a guideline, subject to annual review. In 1999, the AGVR agreed that the DAL would also apply to lasalocid.

DETECTION LIMIT – see Limit of Quantification

DG-SANCO – The European Commission Directorate responsible for health and consumer protection.

GESTAGENS – see hormones

HEAVY METALS – Cadmium and lead are not veterinary medicines. They are found in the environment and can accumulate in animals' body tissues. European law requires them to be analysed for in the National Surveillance Scheme.

HORMONES – Hormones include both naturally occurring and synthetic substances. The use of all hormones to increase growth rate in food producing animals is banned in the EU. Natural hormones are produced by endocrine glands such as the ovaries, testes, thyroid, adrenal or pituitary and released into the blood stream to be carried to a particular organ or tissue, where they produce a specific response. Synthetic hormones include stilbenes, gestagens and thyrostats. Gestagens can be used to control animals' breeding cycles and treat threatened abortion.

INVESTIGATION OFFICER – a member of DEFRA's Legal Department. Usually ex-police officers, they are trained in taking statements.

LOD – Limit of Determination (see LOQ)

LOQ – Limit of Quantification: the smallest analyte concentration for which a method has been validated with specified accuracy and precision. Also known as Limit of Determination or Detection Limit.

MATRIX – The sample of, for example, liver, kidney or animal feed, analysed for the presence of a residue.

METABOLITE – Substances entering the body are usually converted into other chemicals, which are known as metabolites.

MYCOTOXINS – are toxic metabolites produced by some species of fungi – especially strains of *Aspergillus flavus*. These fungi grow on many plant-based foods, such as peanuts. When such mouldy foods are fed to animals, residues of the mycotoxins may later be detected in tissues of the animal.

NSAIDS – are non-steroidal anti-inflammatory drugs. Paracetamol is an example.

ORGANOCHLORINES – compounds such as DDT, were previously used as insecticides. They degrade very slowly in the environment and can be ingested by animals and accumulate in their tissues.

OPs – Organophosphorus compounds which are used as veterinary medicines to control ticks and mites and are currently used in sheep dips. They are also widely used as insecticides.

PCBs – Polychlorinated biphenyls were produced in the UK and other western countries until the 1970's mainly for use in electrical equipment. PCBs are resistant to degradation by normal environmental processes. They are ubiquitous in the environment and generally present in low concentrations in foods.

“POSITIVE” – A “positive” sample is a sample which confirmatory analysis confirms a concentration of an authorised substance above the MRL or Action Level, or where this has not been set for the substance or the matrix concerned, in excess of the Limit of Quantification (LOQ) or the presence of an unauthorised substance – see also DAL, above.

RESIDUE – That portion of the administered dose of a veterinary medicine or other substance present in the tissues, body fluids, products or excreta of an animal arising from treatment of the animal. The total residue includes the parent compound plus any metabolites.

SEERAD – Scottish Executive Environment & Rural Affairs Department.

VETERINARY MEDICINAL PRODUCT, or VMP – in this report, this technical term refers to both veterinary medicines, such as chlortetracycline and also to feed additives, such as nicarbazin, which are defined as zootechnical feed additives.

VPC – Veterinary Products Committee: an independent body of UK experts that advises Ministers on the safety, quality and efficacy of veterinary medicines.

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