The State Laboratory
An tSaotharlann Stáit

Annual Report 2009

Contents

Introduction

Dermot Hayes
State Chemist

This Annual Report describes the progress made during 2009 in implementing the goals of the State Laboratory's Strategy Statement through providing an analytical and advisory service to government departments and offices to support their policies, regulatory programmes and strategic objectives.

During the year more than 13 200 samples were analysed for clients. Tests for 170 analytes were developed. As part of its commitment to quality, the State Laboratory holds accreditation to the ISO/IEC17025 Standard and in 2009 extended the scope to cover 37 test procedures.

During 2009 the government introduced an Incentivised Early Retirement Scheme for staff in the public service which took its toll on numbers in the Laboratory. Four staff retired during the year and two more are expected to retire in 2010. Staff also availed of the Incentivised Career break Scheme introduced in the Supplementary Budget in April. Through reorganisation of work and the continued use of newer technologies, it is hoped the staff reductions will not have too severe an impact on the performance of the Laboratory.

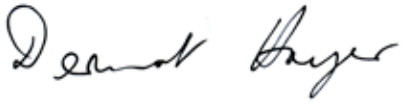
This report details progress made in achieving the targets identified in the Strategy Statement (2008 – 2011) and describes some of the most significant developments. The achievement of these organisational goals depends on the effective mobilization of staff expertise in conjunction with the employment of new and existing analytical technology. Also, in addition to the direct application of analytical science to the achievement of its goals, a major component of the service of the Laboratory to its client Departments is the provision of expert scientific advice. This occurs in areas such as the drafting by Departments of technical legislation, the conduct of court cases and the general administration of the State's business where scientific issues arise. The third main component of the Laboratory's contribution to the work of the public service is through its international role. Staff of the laboratory participate actively in EU and other international forums, representing the national interests of the country on behalf of its client government departments. In these different ways, the scientific expertise is applied towards achieving the aims and goals of the Laboratory itself and contributing to the achievement of larger public policy goals of government and of the public service.

During 2009 the State Laboratory continued to enhance its technical capacities, introducing new analytical procedures and commissioning new equipment. Among a range of enhancements, one of the most significant was the implementation of an advanced method for dioxin analysis. A complex Gas Chromatography Mass Spectrometry (HRGCMS) analytical method that identifies and quantifies the different components that contribute to the total dioxin toxicity in food samples is in use. It became necessary to introduce a more rapid screening method of the detection of dioxins and dioxin-like PCBs in feedingstuffs, in response to client requirements. As described in more detail in this report, the Laboratory introduced a novel biological screening procedure, which can accommodate large numbers of samples and provide more rapid results. This new method is now used in combination with the more complex HRGCMS analysis, which has been retained as a confirmatory method. The combination of new technology, with the retention of the more established method, has added to the value and efficiency of the laboratory's work in this area.

This report outlines the Laboratory's work as a member of the Group of European Customs Laboratories, and gives an insight into one of the areas of international cooperation that the Laboratory carries out on behalf of client departments. In this case, the Laboratory applies scientific expertise and technology to assist in the achievement of the goals of the EU Customs authorities.

Technological advances are continually applied in the laboratory, to enhance the service to clients, in terms of speed of reporting results, the range of analyses conducted and the responsiveness of the laboratory to changing client requirements. As illustrated in this report, significant enhancements of drug analysis were implements in 2009, saving time and analytical resources. Analytical results are thus reported more rapidly to clients.

In 2009 the Laboratory continued to implement the programme of public sector modernization, and to align its activities closely to the requirements of its client departments. In addition to implementing technological improvements in the analytical field, the organisation maintained its commitment to developing its human and organisational resources, notably through the provision of appropriate training and development opportunities. Through the commitment, dedication and hard work of the staff, the Laboratory provided a quality analytical and advisory service to customers and has developed the capacity to meet their future needs.



Dermot Hayes
State Chemist

Strategic Goal 1:

Agriculture & Food

Meet current and future needs for high quality, timely and expanded analytical and advisory services to ensure the highest standards of food safety and quality, consumer protection and animal & plant health.

The State Laboratory assists the Department of Agriculture, Forestry and Food in implementing legislation and in controlling the agriculture and food sectors by analysing samples of food, feed, fertilisers and plants for a wide variety of analytes using a combination of classical and advanced instrumental analytical techniques. It is continuously developing and validating new analytical methods in this area to expand the range of the analytical service provided to meet client requirements, particularly in the areas of undesirable substances in feed and veterinary residues in food of animal origin. As much of the legislation in this area requires the laboratory to be accredited, a significant effort has gone into extending the scope of accreditation in the feed and food areas in recent years.

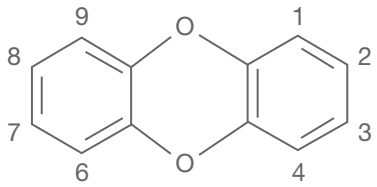
In addition to providing high quality analytical results, the laboratory also provides the Department of Agriculture with expert scientific advice on sampling, interpretation of results and technical aspects of new legislation. As a National Reference Laboratory for Veterinary Drug Residues it provides expert advice to both the Department of Agriculture and to other laboratories carrying out analysis under the National Residue Control Plan. In the Animal Feeds area, the laboratory organises a Proficiency Testing scheme for other laboratories carrying out analysis for the feed industry. With its high level of expertise in the use of mass spectrometry detection, the laboratory regularly provides advice to other government laboratories in relation to the use of this advanced analytical technique.

Dioxins in Food

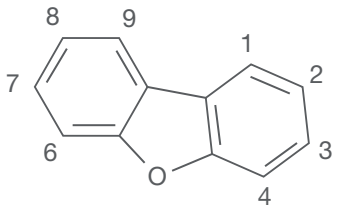
In December 2008, there was a major recall of Irish pork products following contamination with dioxins. It was found that the dioxins had entered the food chain through the contamination of animal feed in one location. The incident highlighted the necessity for increased routine monitoring of both animal feed and human food for dioxins and related substances. The State Laboratory had already been designated as Ireland's National Reference Laboratory (NRL) for dioxin analysis and by January 2009 the laboratory had developed the expertise and technical capacity to carry out the required testing.

A programme to monitor animal feed for dioxins, with a significant emphasis on the analysis of recycled food products used in the feed industry, was agreed with the Department of Agriculture. Consumer protection is the fundamental reason for regulatory efforts to exclude dioxins from the food supply. For this reason, and for reasons of domestic and international consumer confidence in Irish food products, it is necessary to provide highly reliable and rapid analytical results.

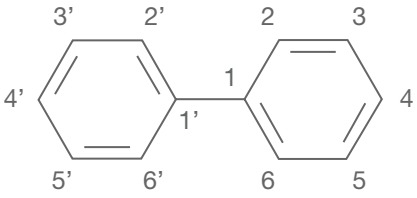
The Laboratory employs advanced analytical techniques to ensure that it provides rapid and reliable results across its entire range of work for its clients. In the case of dioxin analysis, a combination of a biological screening technique and a confirmatory instrumental method is used. The important criteria of reliability, cost-effectiveness and speed are met in this way, and in consequence consumer confidence in Irish agricultural production is effectively sustained.



PCDDs



PCDFs



DL-PCBs

The preferred method for confirmatory analysis of dioxins in food and animal feed is High Resolution Gas Chromatography Mass Spectrometry (HRGCMS). This technique determines and quantifies the presence of 35 related chemicals, 17 of which are either Polychlorinated Dibenzo-p-dioxins (PCDDs) or Polychlorinated Dibenzofurans (PCDFs) and 12 of which are Dioxin-like Polychlorinated Biphenyls (PCBs). The analytical method is highly accurate, but this accuracy is achieved at a considerable cost in time. This obviously presents a problem where speed of delivery of results is of great importance to clients.

As a result, during 2009, the Laboratory introduced a screening method to be run in conjunction with the HRGCMS method. In this the reporting of analyses is accelerated, while maintaining full analytical confidence in the results. The CALUX® Assay screening technique employs the latest advances in biotechnology applied to analytical science. The Assay meets EU criteria when used as a screening method in conjunction with confirmatory HRGCMS testing. The acronym CALUX® stands for **C**hemically **A**ctivated **LU**ciferase e**X**pression, a condensed description of the technique.

The following summary of the mode of operation of the CALUX® assay gives an indication of how the analytical technique is applied in the Laboratory. The CALUX® bioassay uses a modified cell-line, which contains the Luciferase reporter gene under control of a murine DRE (dioxin responsive element). In response to exposure from dioxins and to dioxin-like chemicals, the cell line synthesises luciferase in a dose-dependant way which can subsequently be quantified by an enzymatic light-producing reaction.

The CALUX® cells respond to the presence of dioxins and similar substances in a way which mimics the biological process that is thought to be a significant part of the mechanism of dioxin toxicity. Therefore, this screening technique is confidently taken to provide an accurate measurement of the toxicity arising from dioxin and dioxin-related substances in samples tested.

When a sample is indicated as non-compliant by the CALUX® assay, it is then analysed by the HRGCMS method, which is highly selective and provides confirmatory quantitative results for the individual congeners. For additional confidence, between 2% and 10% of all samples which give negative results in the screening test are also tested by the confirmatory method.

This use of the screening method in conjunction with the HRGCMS method gives a high level of confidence that the analytical results provide a full and true picture of the dioxin content of the materials sampled. Thus, the analytical results of high accuracy can be reported rapidly to clients. Animal feed samples are analysed for dioxins, furans and other PCBs in a more cost-effective and timely manner than the traditional instrumental methods.

Response in 2009 to EU Food and Veterinary Office Audit

In April 2008 the European Commission's Food & Veterinary Office conducted an audit to evaluate the effectiveness of the Department of Agriculture's controls and inspection plans in the areas of Animal Feed production and the Control of Veterinary Residues in Foods of Animal Origin. It also considered the level of compliance with the law by the feed manufacturers and food business operators.

As part of this audit, the State Laboratory's role as an Official Laboratory for Feed Analysis and a National Reference Laboratory in the implementation of Ireland's National Residue Control Plan was examined. The audit report made a number of recommendations concerning the procedures and practices followed in dealing with the analysis of samples in the State Laboratory and in dealing with other laboratories carrying out screening analyses under the National Residue Control Plan. In 2009 a joint team drawn from the Food Safety Authority of Ireland and the Department of Agriculture conducted a follow-up audit of the Laboratory's work in the veterinary drug residues area to verify that corrective actions arising from the 2008 audit had been undertaken. The audit also addressed the effectiveness and appropriateness of official controls in the sector by assessing the current state of compliance. Community and National legislation was also considered and the manner of its implementation and enforcement.

In general, the audit team was satisfied that the Food and Veterinary Office recommendations had been implemented effectively. The laboratory prepared a response to the audit and submitted this to the Department of Agriculture for inclusion in the final report to the Food Safety Authority of Ireland.

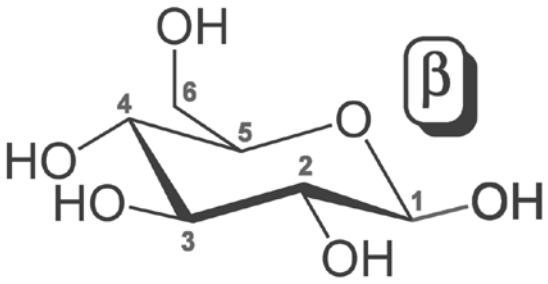
Agriculture	
Category of Sample	No. of Samples
Animal Feedingstuffs	1181
Fertilisers/Limestones	204
Plant Health	2511
Mycotoxins in Feed and Food	412
Dioxins in Animal Feed	301
Veterinary Residues in Food	1165
Veterinary Medicines	85
Nitrates in Vegetables	91
Heavy Metals in Vegetables	75
Sample Total:	**6025**

New Methods Developed (80):

- Method to determine 35 Dioxins and Dioxin-like compounds in Animal Feedingstuffs by HRGCMS
- Method to determine Zearalenone in Animal Feedingstuffs by HPLC
- Method to determine Semduramicin in Animal Feedingstuffs by HPLC
- Method to detect 12 Corticosteroids in Milk by LC MS/MS
- Method to detect 6 Hormones in Serum by LC MS/MS
- Method to detect 11 Nitroimidazoles in Milk by LC MS/MS
- Method to detect 11 Nitroimidazoles in Honey by LC MS/MS
- Method to determine water-soluble Potassium and Sulphur in Fertilisers by Ion Chromatography
- Method to determine Ammonium ion in Fertilisers

Strategic Goal 2:

Revenue



Meet current and future requirements for high quality and timely analytical and advisory services that support maximum compliance with customs and excise legislation.

Analytical science is a major support for the revenue-raising and revenue-protection activities of governments. In Ireland, the State Laboratory provides this important service to Revenue, through routine and exceptional analytical work, through the provision of expert advice on scientific matters within its area of competence, and by providing expert scientific testimony in court when required for Revenue prosecutions. A body of knowledge and expertise has been built up within the Laboratory which is a considerable resource for the State's activities in this area, and which could not easily be secured otherwise. The Laboratory enhances its value to the Revenue through its participation in discussions and exchanges in international forums, and through its activity at EU level on behalf of Revenue. These international activities are particularly valuable for ensuring the currency of the Laboratory's knowledge of developments among Revenue laboratories and similar institutions in other countries. The Laboratory also maintains the currency of its knowledge of new and emerging means of evading revenue regulations internationally. Among the international forums in which the State Laboratory is active in the broad Revenue field, one of the most important is the Group of European Customs Laboratories (GCL).

Group of European Customs Laboratories

The work of European Customs Laboratories is crucial for customs authorities in traditional areas of Customs, Excise and Agriculture policy. Analysis is carried out to determine the appropriate tariff classification of goods traded in the market and the level of duties and other taxes due on goods. The customs laboratories exist to facilitate trade in legal goods while ensuring the fiscal integrity of the customs system and the appropriate collection of revenues. However, their role has also evolved over time with changes in the trade environment, and changes in the remit of customs authorities in Europe, particularly since the creation of the Single Market within a single external customs frontier. With the removal of internal barriers to trade within the EU, Customs authorities have been able to apply their energies to achieving other public policy objectives. In pursuit of these new aims, customs laboratories now play an important part in other customs activities, such as antifraud operations, consumer protection and environmental protection.

Customs laboratories work together at European level through the Group of European Customs Laboratories. Mutual recognition of analytical procedures, a common quality policy and the sharing of scientific and technical expertise are important aspects of this cooperation between the customs laboratories of Members States. Through networking between laboratories, the GCL adds value to the activities of the individual laboratories by providing a structure for them to exchange experience and best practice, allowing each laboratory to benefit from the knowledge of the entire group.

The GCL has adopted a programme of work, and has established for this purpose six core activities, which it terms 'Integrated Actions'. These are directed at coordinating the activities of customs laboratories within the EU. The State Laboratory, as an active member of the GCL, participates in this programme of work. By cooperating with its equivalent laboratories in other member states, the State Laboratory adds to the value of the entire effort, and simultaneously contributes to its achievement of its own internal Strategic Goal in the Revenue area, both on a day-to-day basis, and by close involvement in new developments in its field of operations. The six Integrated Actions of the GCL are detailed below. (Further details can be obtained from the Europe Commission website, ec.europa.eu.)

Action 1 – *The ILIADE database of Analytical Methods* provides customs laboratories with a compilation of methods suitable for customs purposes and is available to all customs laboratories from the EU member states and on special request to non-EU countries.

Action 2 – *Intercomparisons and Method Validations*, lays the foundations for validating existing analytical methods and for developing new techniques. Studies aim to harmonise the analytical methods used by laboratories and to compare and validate those used for tariff classifications and other policies, while proficiency tests enable laboratories to benchmark their performance against their peers.

Action 3 – *Networking on Quality* aims to develop a common quality policy for all customs laboratories to ensure uniform interpretation of quality requirements and to establish the basis for the mutual acceptability of test data. In addition, attention has been paid to developing a handbook outlining guidelines for sampling procedures and to the issue of measurement uncertainty.

Action 4 – *Strategy, Communication and Events*, concerns scientific and technical communication and exchanges, including the organisation of workshops, seminars, conferences and training days. This fourth action also deals with strategy/future perspectives, studying new trends and challenges faced by the customs laboratories.

Action 5 – *Scientific Expertise*, was one of two new actions introduced in 2009, further enhancing the GCL's role in harnessing scientific expertise. Within Action 5, steps are being made towards the development of a scientific customs force that can rapidly respond to requests for scientific advice or expertise for example to identify drug precursors.

Action 6 – *European Customs Inventory of Chemical Substances (ECICS)*, is an information tool on chemicals specifically designed for customs official and economic operators involved in customs declarations. ECICS provides reliable classifications in the customs nomenclature for chemicals, and being freely available on the internet, is used worldwide. It currently contains more than 30,000 approved classifications.

Revenue	
Category of Sample	**No. of Samples**
Customs/CAP	1472
Hydrocarbon Oils	1023
Alcohols	308
Sample Total:	**2803**

New Methods Developed (1):

- Method for Methanol in Petrol by GC

Strategic Goal 3:

Coroner Service and Other Departments

Meet current and future requirements for timely, high quality services in areas such as forensic toxicology, health and safety compliance, environment and heritage protection, and metrology

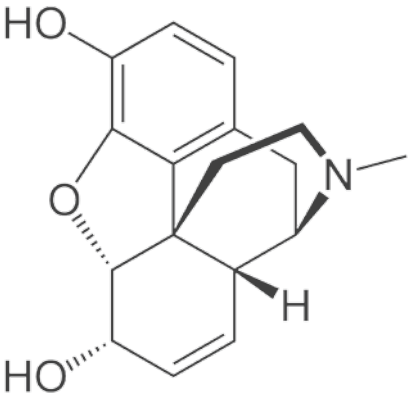
This Strategic Goal covers a diverse range of the Laboratory's analytical and advisory activities. Technological developments in analytical science are occurring at a rapid pace in many of these areas, and it is necessary for the laboratory to devote attention and resources to ensuring that it maintains its position at the forefront of these developments. Much of the work requires the laboratory to keep pace with the activities of illicit producers of deleterious chemical agents and drugs, so that it can continue to provide analytical services appropriate to the needs of clients in such a rapidly changing environment.

The work that the Laboratory undertakes for the Coroner Service in particular brings it into direct contact with the interests of individual citizens. In ensuring that its analytical services in this area are of the highest quality, the Laboratory continually endeavours to reduce the time taken to report on samples, both through the dynamic management of its work, and through the application of new and improved technologies. In 2009, certain analytical techniques were developed further in the Laboratory, and were extended to include new ranges of analytes. This has further enhanced the quality of results and reduced the reporting time for samples.

Enhancement of service through the use of technological developments

A major advance was achieved through the introduction of a single procedure for the confirmatory analysis of the presence of opiates, amphetamines and cocaine compounds in urine. The Liquid Chromatography Mass Spectrometry (LCMS) analytical technique was further developed in 2009 and was introduced into mainstream work for toxicological samples, resulting in shorter analysis and reporting times. This single method replaces three separate methods, each of which had been more time-consuming because they required a number of sample preparation stages.

A second substantial reduction in analytical time was achieved through a radical change in how the analysis for prescribed drugs was managed. In general, considerable savings in time and analytical resources can be achieved through the use of a combined screening and confirmatory analytical method, when it can be confidently demonstrated that it is unnecessary to subject all samples to the full confirmatory process. The Laboratory has the expertise to assess the appropriateness of screening methods for classes of compounds, and to



apply such screening methods to the best advantage in the management of analysis. Time and resources were applied by the Laboratory to the question of developing and using a screening method for the analysis of a large number of drugs commonly prescribed by medical practitioners in Ireland. A preliminary study was carried out to identify those most commonly prescribed in Ireland and a selection of tranquillisers, sedatives, anti depressants and other drugs was made from this list, totalling 65 compounds.

An LCMS-based procedure was developed for this prescribed drugs analysis. A screening and confirmatory procedure specifically targeted for these compounds was developed, validated and introduced for routine use. The use of this procedure also assisted in improving sample throughput as it combines both screening and confirmatory capability in the one process. As a result, it became unnecessary to carry out a second analysis to confirm the findings of the screening test. The use of appropriate technology has resulted in savings in analyst time, and this has translated into more rapid reporting of results to clients.

There is an on-going requirement to broaden the range of drugs covered by the methodology employed in the Laboratory, in order to respond to the range of substances being used and abused. The application of LCMS technology, which can cater for a wide range of such substances, and which is sufficiently selective to detect low levels of the drugs in biological samples with a minimal amount of sample pre-treatment, greatly assists with the challenge of keeping current with client requirements.

While the most commonly detected drugs of abuse during 2009 were heroin and cocaine, the incidence of misuse of other substances has grown. For example, the new amphetamine-type drug Benzylpiperazine (also known as BZP or 'legal ecstasy') was detected in 20 cases. This drug was banned in 2009. A number of alternative designer drugs which are widely available in so-called 'headshops' (including herbal and cannabinoid-type drugs, and cathinone derivatives) came to high-profile attention during the year, and the laboratory has the capacity to analyse for such substances.

The active and flexible management of skilled analytical scientists using advanced techniques and equipment maximises the potential of the Laboratory to provide services where client demands can change in response to external factors. The Laboratory responds quickly to changes in the illegal drug environment, and provides analytical resources to give effect to changes in drugs legislation. The necessity to respond quickly and flexibly to short-term changes imposes a responsibility on the Laboratory to maintain the currency of its organizational knowledge in this area and to ensure that it continues to build its capacity to analyse for novel substances that come into mainstream and/or illicit use.

Coroners/Environment/Irish Medicines Board (IMB)	
Category of Sample	No. of Samples
Human Toxicology	3713
Public Health	454
Environment	85
Heritage Protection	49
IMB	78
Sample Total:	**4379**

New Methods Developed (89):

- Prescribed drug screen extended to include 1 new analyte – Levamisole
- LC MS/MS method for Drugs of Abuse in Urine extended to include 7 new Amphetamine compounds plus Lignocaine and Cocaethylene
- LC MS/MS method for Prescribed Drugs developed to determine 65 of the most commonly prescribed drugs in blood and urine
- HPLC methods developed and validated for identification of Yohimbine, 5-Hydroxytryptophan, Ibuprofen, Tadalifil, Theophylline, Cefradine, Dexamethasone Acetate, Acetyl Salicylic Acid and Diazepam.
- LC MS method developed for analysis of Ginkgo Terpene Lactones
- A new ICP MS method was developed to determine Copper and Zinc in Serum
- An FT NIR method was validated for RON and MON analysis in Petrol

Strategic Goal 4:

Modernization Agenda and Operational Capabilities

ONEGOV
Transforming Public Services

Develop our organisational capacity, human and physical resources to ensure quality service delivery, while implementing public sector modernisation requirements.

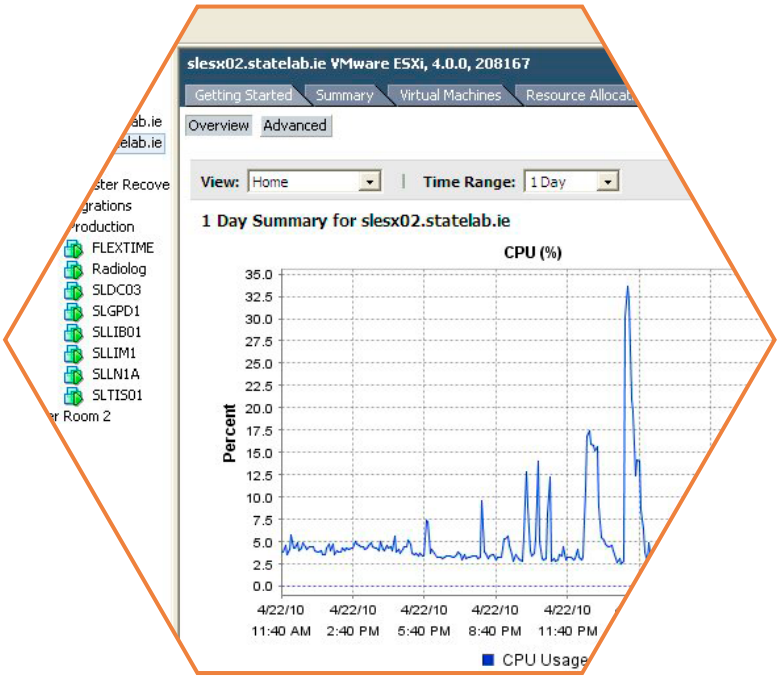
Development of Organizational Capacity and of Operational Capabilities

Throughout 2009 the Laboratory enhanced its operational capabilities, as indicated under the three previous Strategic Goals. New analytical methods across the range of its activities were developed. New technologies were introduced, notably in the case of dioxin screening. Existing technologies were further developed and applied in the laboratory, as in the case of LCMS analysis for drug screening. The result of these changes in technology and in working practices continues to lead to more rapid response times in reporting results to clients, while maintaining the required high quality of analytical results.

The modernization agenda was also furthered in the laboratory during 2009, notably through the continued flexible deployment of staff, allowing the organisation to respond quickly and dynamically to changing work demands. The Laboratory also continued to invest in its staff through training, yielding further gains from existing expertise, and enhancing outputs from individuals and from analytical sections in the Laboratory. In addition to programmes of scientific training, selected staff availed of focussed training in management and personal development domains, where this was a recognised requirement of their particular role or developmental needs. The Laboratory used its internal resources to train and educate staff both formally and informally. As in previous years, staff continued to avail of the laboratory's organisational support for education and training which they undertook in their own time, where this was of recognised assistance to the achievement of the organisation's goals.

Family-Friendly Policies and Equality of Opportunity

State Laboratory staff have access to a wide range of family-friendly policies, including work-sharing, flexitime, parental leave and term time working. However, since the moratorium on recruitment was introduced in 2009, shortfalls arising from staff availing of these measures have had to be absorbed by the Laboratory.



Scheme	No. of staff availing of scheme
Worksharing	13
Parental Leave	8
Career Breaks	4
Term Time	3

The Laboratory is committed to an equal opportunities policy. The numbers of men and women in each grade at the end of 2009 is given in the table below.

Breakdown by Grade & Sex of Staff Numbers		
Grade	Women	Men
State Chemist	0	1
Principal Chemist	1	1
Senior Chemist Grade I	4	4
Assistant Principal Officer	1	0
Technical Information Mgr	0	1
Chemist Grade II	4	4
Chemist	8	10
Higher Executive Officer	1	1
Senior Laboratory Analyst	9	7
Laboratory Analyst	14	8
Staff Officer	2	1
Clerical Officer	6	0
Storekeeper	0	2
Head Laboratory Attendant	0	1
Laboratory Attendant	1	6
Total	**51**	**47**

Financial Information

The table below summarises the State Laboratory financial expenditure in 2009, with figures for 2008 provided for comparative purposes.

	2008	2009
Gross Expenditure	€'000	€'000
A1. Salaries Wages & Allowances	5,405	5,523
A2. Travel and Subsistence	46	39
A3. Incidental Expenses	401	342
A4. Postal & Telecommunications Services	76	74
A5. Apparatus & Chemical Equipment	2,287	1,967
A6. Office Premises Expenses	1,950	1,277
A7. Consultancy Services	29	12
Gross Total:	**10,194**	**9,234**

External Scrutiny

INAB Surveillance audit

To ensure wide and international acceptability of our results, our key analytical procedures are accredited to ISO/IEC Standard 17025. Maintenance of this accreditation requires an annual surveillance by INAB, which was successfully completed in February this year.

Financial Auditing

The State Laboratory's Audit Committee met twice in 2009. Internal audits were conducted on Computer System Controls, Business Continuity & Crisis Management, and Financial Reporting & Treasury Cycle.

The Comptroller and Auditor General's Office carried out the annual audit of the 2008 Appropriation Account in April 2009. No significant issues were raised during the audit.

Customer Charter

The laboratory has agreed specific performance targets with all its major clients. These targets include issues such as turn-around time, methods of analysis to be used, and reporting requirements. This is detailed in Appendix I of this report.

Freedom of Information

There was one request to the Laboratory for information under the Freedom of Information Acts.

Staffing

During 2009 four staff retired, a Senior Chemist, two Senior Laboratory Analysts and one Laboratory Analyst. Two staff left on career breaks and one left on completion of secondment from another department. Five staff joined the Laboratory during the year. Three Chemists were recruited through open competition. A Clerical Officer and a Higher Executive Officer joined the staff on secondment from other Government Departments.

In 2009 the Laboratory continued with its student placement scheme in association with Dublin City University (DCU), Dublin Institute of Technology (DIT) and Limerick Institute of Technology (LIT). Three students, one from each of the colleges, were placed in areas of the laboratory complementary to their academic discipline for six months. One student from Carlow Institute of Technology was given a three-month placement.

Partnership Committee

The Partnership Committee met on four occasions during 2009. Following a Climate Survey conducted in 2007 by the National Centre for Partnership Performance, the Partnership Committee drew up an Action Plan in 2008 to implement its findings. By the end of 2009 all action points from the Plan had been implemented.

During 2009 the Committee decided to implement an "open seat" initiative to raise staff awareness of the Partnership process. A number of staff availed of this opportunity to attend Partnership Committee meetings as observers.

Staff Training 2009

A series of seminars for laboratory staff was held in the lecture theatre in Backweston. The list of topics included the Civil Service Code of Standards and Behaviour, the role of the Partnership Committee, Pensions in the Public Service, and Library and Information Services in the Laboratory.

On-site technical training, using the modern facilities available in Backweston, was organised for staff members in the following areas: Statistics for Chemical Analysis, Liquid Chromatography-Mass Spectrometry, Microsoft Excel software.

Training in the soft skills area included Leadership Effectiveness Analysis for senior managers and Stress Management and Awareness. Courses in Interviewer Training and Courtroom Skills were also organised for selected staff who identified these areas as training needs through the PMDS process.

Safety

The Laboratory is committed to maintaining a safe and secure environment for its staff. In 2009 there were no reportable safety incidents.

Information and Communication Technology

The core ICT system in the Laboratory is the Laboratory Information Management System (LIMS). The main focus of activity in 2009 was automating data entry where this was possible. Several of the newer analytical instruments produce large amounts of data which would take days to enter manually but can be imported in minutes once the process is automated.

As the ICT servers were to reach end-of-life in late 2009, they were replaced by a new virtualised system. Seventeen servers are now running on two hosts, giving a much more efficient system using approximately 25% of the power. The new system also provides a more complete Disaster Recovery function.

Meetings

The State Laboratory services EU and other international committees at the request of its client Departments. Laboratory personnel also participate in the work of other international expert scientific bodies and conferences. The following list indicates the range of committee work undertaken by State Laboratory personnel, and of the conferences and meetings attended.

CEN (European Committee for Standardization) 12th Meeting of CEN Technical Committee TC 327 on Animal Feedingstuffs, Brussels.

CEN TC 327 WG4 Meeting (Technical Committee Working Group) Brussels

Irish Mass Spectrometry Society Meeting, Dublin, May 2009. Three members of the Organising Committee of this meeting are State Laboratory staff: Michael O'Donnell, Edward Malone and Dr Liam Regan.

UK & Ireland Forensic Toxicology Network Group

SOFT (Society of Forensic Toxicologists) conference

Early Warning Committee for New and Synthetic Drugs in the National Advisory Committee on Drugs

Committee for the National Drugs Related Death Index

Workshop on hormones given by the Community Reference Laboratory, 'RIVM', (the National Institute for Public Health and the Environment,) in Utrecht, the Netherlands

Workshop organized by the Community Reference Laboratory, 'BVL' (the Federal Office of Consumer Protection and Food Safety) in Berlin, Germany.

Presentation given on "The analysis of anti-inflammatory drugs by LC-MS/MS" at CRL-NRL workshop in Berlin.

Two workshops organized by the Community Reference Laboratory for Dioxins and PCBs in Food and Feed, Freiburg, Germany.

Codex Alimentarius meeting, Budapest, Hungary

Presentation on the dioxins contamination incident of Nov 2008 at a workshop organized by the CRL for Dioxins and PCBs in Food and Feed, Freiburg, Germany.

Steroid analysis in hair by LCMS – Presentation to Irish Mass Spectrometry Society Meeting, May 2009

Prescribed Drugs in blood by LCMS – Presentation at Applied Biosystems Seminar, October 2009

Human Toxicological Analysis in the State Laboratory – Presentation at Hospital Pathologist Seminar at Royal College of Physicians, November 2009

Presentation given on EU legislation for Veterinary Drug Analysis at Workshop on Routine and Screening Methods of Analysis held in Dublin by the State Laboratory.

Publications

Scientific publications where one or more authors worked in the State Laboratory in 2009.

Bioletti S, Leahy R, Fields J*, Meehan B and Blau W.
The examination of the Book of Kells using micro-Raman spectroscopy.
Journal of Raman Spectroscopy (2009), Vol 40(8), pp 1043-1049

Cronly M*, Behan P, Foley B, Malone E*, Regan L*.
Rapid confirmatory method for the determination of 11 nitroimidazoles in egg using liquid chromatography tandem mass spectrometry.
Journal of Chromatography A. 2009;1216(46): 8101-9.

Cronly M*, Behan P, Foley B, Malone E*, Regan L*.
Development and validation of a rapid method for the determination and confirmation of 10 nitroimidazoles in animal plasma using liquid chromatography tandem mass spectrometry.
Journal of Chromatography B 2009 May 15; 877 (14-15): 1494-500.

Dowling G*, Gallo P and Regan L*.
Confirmatory analysis of firocoxib in bovine milk by rapid resolution liquid chromatography tandem mass spectrometry.
Journal of Chromatography B, Volume 877, Issues 5-6, 15 February 2009, Pages 541-546

Dowling G*, Gallo P, Malone E*, Regan L*.
Rapid confirmatory analysis of non-steroidal anti-inflammatory drugs in bovine milk by rapid resolution liquid chromatography tandem mass spectrometry.
Journal of Chromatography A, Volume 1216, Issue 46, 13 November 2009, Pages 8117-8131

Kinsella B, O'Mahony J, Malone E*, Moloney M, Cantwell H, Furey A, Danaher M.
Current trends in sample preparation for growth promoter and veterinary drug residue analysis.
Journal of Chromatography A. 2009 Nov 13; 1216(46): 7977-8015.

McDonald M*, Mannion C and Rafter P.
A confirmatory methods for the simultaneous extraction, separation, identification and quantification of Tetracycline, Sulphonamide, Trimethoprim and Dapsome residues in muscle by ultra-high-performance liquid chromatography-tandem mass spectrometry according to Commission Decision 2002/657/EC.
Journal of Chromatography A, 2009, 1216, pp 8110-8116

Malone E*, Dowling G*, Elliott C, Kennedy G, Regan L*.
Confirmatory method for the determination of various acetylgestagens in animal kidney fat using liquid chromatography-tandem mass spectrometry.
Food Additives and Contaminants Part A, 2009; 26(5): 672-82.

Malone EM*, Elliott CT, Kennedy DG, Regan L*.
Development of a rapid method for the analysis of synthetic growth promoters in bovine muscle using liquid chromatography tandem mass spectrometry.
Analytica Chimica Acta. 2009; 637(1-2): 112-20.

Malone EM*, Dowling G*, Elliott CT, Kennedy DG, Regan L*.
Development of a rapid, multi-class method for the confirmatory analysis of anti-inflammatory drugs in bovine milk using liquid chromatography tandem mass spectrometry.
Journal of Chromatography A. 2009; 1216(46): 8132-40.

** working in the State Laboratory, 2009.*

Appendix I:

Progress Report on Customer Charter Objectives

Progress Report on Customer Charter Objectives

The State Laboratory's mandate is to provide Government Departments and Offices with an analytical and advisory service that supports their policies and regulatory programmes. The State Laboratory is committed to providing a quality analytical and advisory service to all its customers and to meeting the challenges presented by changing regulatory customer needs and new and emerging technologies. The goal of the Customer Charter is customer satisfaction through the delivery of a quality service.

The State Laboratory is committed in this Charter to:

1. Provide a top quality analytical and advisory service for its customers in an efficient and effective manner appropriate to the customer's needs and commensurate with the principle of fitness for purpose.
   Service level agreements with clients are in place for the analytical work of the laboratory.

2. Provide adequate Service Level Agreements to customers detailing the standard of service to be provided including specific targets for sample turn around times.
   The service level agreements in place deal with all aspects of the service provided to clients, including quality of service, range of service, timeliness, advice, helpfulness and flexibility.

3. Meet the commitments given in the Service Level Agreements.
   Client satisfaction rating with the service provide by the State Laboratory ranged from 100% very satisfied or fairly satisfied with the advice provided, 99% very satisfied or fairly satisfied with helpfulness and flexibility of the service, 96% very satisfied or fairly satisfied with the quality of the service, 86% very satisfied or fairly satisfied with the range of service provided and 66% very satisfied or fairly satisfied with the timeliness of the service.

4. Hold regular meetings with customers to review the quality of the service provided, to identify future legislative trends and their impact on customers' requirements and to manage customers' expectations where these are unreasonable.
   Meetings are regularly held with clients.

5. Operate in accordance with a documented quality system based on an international standard for competence of testing laboratories (ISO/IEC 17025) and obtain and hold accreditation from the Irish National Accreditation Board for specific areas of work where required by the customer or by regulation.
   The Laboratory is accredited for 37 test procedures to ISO/IEC 17025. Internal audits conducted by a team of trained auditors ensure compliance with the international standard.

6. Provide competent and impartial expert witness testimony in courts of law on issues relating to its analytical and advisory services.
   Staff attend court as expert witnesses where required.

7. Provide advice and information as requested within an agreed timescale.
   Performance is monitored against agreement made in Service Level Agreements and reviewed at least yearly. The Output Statement is available on the Department of Finance website www.finance.gov.ie

8. Continuously adapt the analytical service to technical progress and develop greater analytical capacity through the evaluation of emerging technologies and the introduction of new methods and new instrumentation.
   This is detailed under each of the Strategic Themes in the Development of Analytical Capacity sections of the Annual Report.

9. Ensure that the expertise and analytical capability is developed to provide for the anticipated future analytical and advisory needs of customers.
   Extensive analytical training is carried out.

10. Remain current with developments in relevant analytical and regulatory areas by attending meetings of EU and other international organizations and by representation on relevant scientific working groups.
    Staff attend the relevant meetings.

11. Contribute towards the development of international documents & guides concerned with chemical and bio analysis.
    Relevant contribution made at meetings attended.

Appendix II:

List of Accredited Tests

INAB Accredited tests (Summary of Schedule of Accreditation, edition 12 of 07/08/2009)*

Matrix	Measurand	Test Method
Animal Feedstuffs	Crude Protein	Method based on Commission Directive 93/28/EEC
Animal Feedstuffs	Crude Oils and Fats	Commission Directive 98/64/EC.
Animal Feedstuffs	Crude Oils and Fats	NIR Spectroscopy
Animal Feedstuffs	Crude Ash	In-house method based on Commission Directive 71/250/EEC
Animal Feedstuffs	Crude Ash	Gravimetric method using a Microwave Furnace
Animal Feedstuffs	Crude Fibre	Commission Directive 92/89/EEC.
Animal Feedstuffs	Crude Fibre	NIR Spectroscopy Screening Method
Animal Feedstuffs	Moisture	Commission Directive 71/393/EEC.
Animal Feedstuffs	Nicarbazin	In-house HPLC method with DAD, based on CANFAS-STM-4-CT94-2216
Animal Feedstuffs	Trace Elements: Copper, Manganese & Zinc	Commission Directive 78/633/EEC (Atomic Absorption Spectroscopy)
Animal Feedstuffs	Trace Elements: Copper, Manganese & Zinc	In-house method based on Commission Directive 78/633/EEC using Microwave Pressure Digestion (Atomic Absorption Spectroscopy)
Animal Feedstuffs	Arsenic	In-house method based on 73/46/EC using Microwave Digestion and Flame Atomic Absorption Spectroscopy
Animal Feedstuffs	Magnesium	In-house method using Dry Ashing and Hydride Generation Atomic Absorption Spectroscopy
Animal Feedstuffs	Lead, Cadmium & Cobalt	EN15550:2007 using Pressure Digestion and Graphite Furnace Atomic Absorption Spectroscopy for Pb & Cd. In-house method based on EN15550:2007 for Co.
Animal Feedstuffs	Monensin, Narasin & Salinomycin	EN ISO 14183. HPLC method using Post Column Derivatisation.
Animal Feedstuffs	Crude Protein	EN ISO 16634-1:2008. Nitrogen Content by Consumption according to the Dumas Principle.
Milk (Liquid & Powder)	Aflatoxin M1	Based on an EU/STM method. Extraction and IA column clean-up. Determination by RP HPLC with Fluorescence Detection.

Matrix	Measurand	Test Method
Straight and Compound Animal Feedstuffs	Aflatoxin B1	Based on an EU/STM method. Extraction and IA column clean-up. Determination by RP HPLC with fluorescence detection.
Feed and Cereals	Ochratoxin A	In-house method using IA column cleanup and RP HPLC with fluorescence detection.
Lettuce, Spinach & Cabbage	Nitrates	In-house based on EN12014-2:1997-04. Determination by anion exchange chromatography following extraction and clean-up.
Pharmaceutical samples	Identification and/or quantification of pharmaceuticals samples: Flexible Scope (Analyte and Range)	In-house method using HPLC –DAD.
Petrol and Diesel Fuels	Sulphur	ISO 20884:2004 Wavelength Dispersive X-Ray Fluorescence Spectroscopy
Cheese & Processed Cheese	Total Solids Content	EN ISO 5534:2004 (IDF 4:2004). Gravimetric following oven drying.
Cheese & Processed Cheese	Fat Content	EN ISO 1735:2004 (IDF 5:2004). Gravimetric following acid digestion, solvent extraction and oven drying (Schmid-Bondzynski-Ratzlaff principle).
Milk and Milk Products	Fat Content	IDF 1C:1987;(IDF 13C:1987;IDF 16C:1987;IDF 9C:1987 (Rose-Gottlieb Principle).
Pure starches, Animal feed, Foods	Starch	EEC Directive 72/199/EEC (Annex 1), determination by the Polarimetric Method (Ewers principle).
Alcoholic Drinks	Alcoholic Strength by Volume	In-house using a density meter following distillation.
Gas Oil	C.I. Solvent Yellow 124	In-house method. Determination by HPLC.
Meat and Meat Products	Nitrogen	ISO 937:1978 Kjeldahl Method

Matrix	Measurand	Test Method
Meat and Meat Products	Hydroxyproline	In-house method based on ISO 3496-1994.
Blood & Urine	Amphetamine Class Compounds	In-house method. Determination by Gas Chromatography with MS detection using internal standards following liquid-liquid extraction and derivatisation.
Blood & Urine	Ethanol	In-house method. Determination by internal standard quantitation using Headspace Gas Chromatography with Flame Ionisation Detection.
Blood	Carbon Monoxide	Automated Spectroscopic Method using an IL682 CO-Oximetry Instrument
Animal Plasma and Milk	Confirmatory Analysis of Non Steroidal Anti Inflammatory Drugs. Flexible Scope (Matrix, Analyte and Range)	In-house method using solid phase extraction, and detection by LC-MS/MS.
Animal Urine **Animal Serum	Confirmatory Analysis of Hormones. Flexible Scope (Matrix, Analyte and Range)	In-house method using solid phase extraction, detection by LC-MS/MS.
Animal Kidney Fat	Confirmatory Analysis of Gestagens. Flexible Scope (Matrix, Analyte and Range)	In-house method using solid phase extraction, detection by LC-MS/MS.
Animal Serum	Confirmatory Analysis of Nitroimidazoles. Flexible Scope (Matrix, Analyte and Range)	In-house method using solid phase extraction and detection by LC-MS/MS.

* For further details, see our schedule of accreditation (Reg. 146T) on the INAB website (www.inab.ie).

** Matrix not on Schedule of Accreditation but added to LAAT in 2009 under Flexible Scope.

Appendix III:

Staff List

State Chemist
Dermot Hayes

Principal Chemist
Ita Kinahan

Veterinary Toxicology
John McBride – SC
Edward Malone – CII
Dr. Jonathan Carroll – C
Michael Doyle – C
Dr. Pierrick Fevrier – C
Myra Keogh – C
Dr. Mark McDonald – C
Sheevaun Cody – SLAN
Tom Harbison – SLAN
Sheila Martin – LAN
Simon Chiu – LA

Contaminants and Plant Health
Patricia Bonner – SC
Mark Sutton – CII
Ruth Reilly – C
Aengus O Briain – SLAN
Mairead Rowsome – SLAN
Judith Boyle – LAN
Ciara McDonnell – LAN
Tom Gaule – LA

Quality Assurance Unit
Dr. Gráinne Carroll – SC

Animal Feedingstuffs
Dr. Paula Shearan – SC
Joe Foley – C II
Eileen McCarron – C II
Sharon Cosgrave – C
Dr. John Fields – C
Angela Cunningham – SLAN
Fiona Noonan – SLAN
Simon Daly – LAN
Marella Gallagher – LAN
Keith O'Sullivan – LAN
Dennis Sheehan – LAN
Johanna Skelton – LAN
Fiona White – LAN
Paul Hirtes – HLA
Mary Greene – LA
Chris Taaffe – LA

Accountant
Joe Hanahoe

Corporate Services
Marion Kiernan – AP
Hugh Drumm – HEO
Nuala Talty – HEO
Phyllis Barry – SO
John Clancy – SO
Grainne Harnan – SO
Geraldine Gaffney – CO
Anne O'Dwyer – CO
Elizabeth Ellard – CO
Lisa Gough – CO
Rachel Kelly – CO
Ciara McDaid – CO

Postgraduate Student
Mark Cronly

Career Breaks
Dr. Mandy O'Keeffe – C
Bernie Scully – LAN
Sinéad Foran – LAN
Audrey Nugent – C

Abbreviations

SC:	Senior Chemist
CII:	Chemist II
TIMII:	Technical Info. Manager Grade II
C:	Chemist
SLAN:	Senior Laboratory Analyst
LAN:	Laboratory Analyst
HLA:	Head Laboratory Attendant
LA:	Laboratory Attendant
AP:	Assistant Principal
HEO:	Higher Executive Officer
SO:	Staff Officer
CO:	Clerical Officer

Principal Chemist
Michael Nangle

Customs and Excise
Dr. Siobhán Ní Ghríofa – SC
Dr. Seán McGowan – CII
Eddie McGrath – C
John Reilly – C
Dr. David Savage – C
Claire Timbs – C
Bernard Hanratty – SLAN
Neil Lucey – SLAN
Noreen Monahan – SLAN
David Canny – LAN
Laura Flynn – LAN
Madeleine Gibbons – LAN
Anita Heffernan – LAN
Ray Kelly – LAN
Denis Ryan – LAN
Ciarán Brown – Storekeeper
Damien Duffy – Storekeeper
Brendan Doyle – LA

IT
Michael O'Donnell – SC
Dr. Michael O'Gorman – TIMII
Brian McDonald – SLAN

Human Toxicology
Dr. Liam Regan – SC
Dr. Yvonne Kavanagh – CII
Frances Mahon – CII
Dr. Eleanor Dixon – C
Joseph Fitzsimons – C
Úna Mc Ardle – C
Dr. Julie Tierney – C
Geraldine Dowling – SLAN
Marian Lyons – SLAN
Mary Murphy – SLAN
Ann Marie Bragason – LAN
Patricia Carter – LAN
Carol Gleeson – LAN
Alan Murphy – LAN
Olivia O'Connor – LAN
Colm Reid – LAN
Declan Powell – LA

Environment and Health
Dr. William King – SC
Joanne Ryder – CII
Dr. Seán Earley – C
Niamh Fitzgerald – C
Phil Dawson – SLAN
Seán King – SLAN
Keith Pearson – SLAN
Sinead Bermingham – LAN
Syl O'Neill – LA