



## Residue chemistry and laboratory performance evaluation

Annual Report 2007–2008

## Laboratory performance evaluation and proficiency testing

Description	169
Outputs	170
Highlights	170
Performance	170
Outlook	174

## Externally funded performance evaluation

Description	174
Outputs	174
Performance	175
Outlook	175

# Laboratory performance evaluation and proficiency testing

## Description

The National Residue Survey (NRS) procures analytical services by contracting public and private sector laboratories to analyse samples for chemical residues. Laboratories are selected by competitive tender based on suitable proficiency, accreditation to an international standard and value for money.

NRS has been accredited by the National Association of Testing Authorities (NATA) as a proficiency test provider since July 2005. The criteria for accreditation are set out in the International Laboratory Accreditation Cooperation (ILAC) G: 13 document *Guidelines for the Requirements for the Competence of Providers of Proficiency Testing Schemes*.

Accreditation is important because it ensures that NRS proficiency testing (PT) is recognised within the laboratory community in terms of meeting internationally accepted standards in both technical competence and the ability to establish the proficiency of participating laboratories.

NRS also provides fee-for-service PT for external clients. Accreditation is essential because clients require PT providers to be accredited to international standards.

The NRS Eighth Term contracts with participating analytical laboratories commenced on 1 July 2006 and continued for two years to 30 June 2008. The Ninth Term commenced on 1 July 2008. Laboratory PT takes place periodically according to the PT schedules available from the NRS laboratory performance program.

In order to ensure the efficiency and acceptability of industry-operated monitoring projects and quality assurance systems, the process of laboratory selection for the Ninth Term involved the following:

- determination of the residue testing requirements for animal and plant products by NRS managers in consultation with industry
- publication of the NRS *Proficiency Test Handbook* advising laboratories of the specifications of the analytical programs that will be on offer for the contract period
- release of the request-for-tender document on the AusTender website, according to Australian Government purchasing guidelines
- participation by those laboratories considering placing tenders in the relevant pre-tender proficiency tests administered by NRS
- submission of tenders by laboratories
- evaluation of tenders by NRS through the laboratory selection committee.
- notification of successful tenders to laboratories
- dispatch of contracts to successful laboratories in time for sign-off prior to commencement of testing on 1 July 2008.

The laboratory evaluation committee checks the submissions against the criteria specified in the request-for-tender. The criteria include: laboratory performance in pre-tender proficiency testing; laboratory management; staffing; equipment and facilities; quality assurance systems; accreditation status; appropriateness of analytical methods; and pricing.

## Outputs

This program underpins the efficiency and credibility of NRS residue testing projects by providing sustainable access to technically competent and cost-effective laboratories for the analysis of samples from residue testing projects.

Advice was provided on all aspects of residue chemistry to other areas of the Australian Government Department of Agriculture, Fisheries and Forestry as well as to other Australian, state and territory government authorities.

## Highlights

Following selection of analytical laboratories for the Ninth Term (2008–2011), preparation of contracts for signing commenced in early 2008, and contracts were ready for signing before the new term started on 1 July 2008.

NRS maintained accreditation as a proficiency test scheme provider following a 2007 reassessment against the relevant international standard by NATA.

NRS published a revision of the tenth edition of the *Proficiency Test Handbook*, which outlines the proficiency test requirements relating to the 2008–2011 NRS laboratory contract period.

A new proficiency test scheme was developed and implemented for paradichlorobenzene in honey, involving both Australian and international laboratories.

The NRS laboratory proficiency program met all Australian Quarantine and Inspection Service (AQIS) oversight requirements.

Laboratory services were procured for a number of *ad hoc* testing projects.

## Performance

For the laboratory performance evaluation (LPE) and proficiency testing (PT) programs run on behalf of participating industries, NRS performance is measured by:

- procurement of laboratory services in compliance with the Australian Government's *Commonwealth Procurement Guidelines*
- confirmation of the technical integrity of NRS analytical results through proficiency testing that assesses and monitors the performance of laboratories, thus ensuring international acceptance of NRS data
- validation that laboratory assessments in proficiency tests and in contracted work accord with agreed scientific standards
- acceptance by domestic and overseas stakeholders of the NRS residue testing program which includes outsourced analytical laboratory services supported by NRS-managed PT and monitoring of laboratory performance
- effective and timely responses to emerging needs.

**PERFORMANCE INDICATOR ONE**

Confirmation of the scientific integrity of NRS analytical results by performance testing to assess and monitor the proficiency of laboratories, thus ensuring international acceptance of NRS residue data.

**Achievements**

<b>Intra-laboratory check sample data</b>	NRS contract laboratories are required to implement a comprehensive intra-laboratory check sample regime in addition to their normal laboratory quality assurance measures. The requirement for laboratories to notify NRS of intra-laboratory check sample performance continued during 2007–2008. NRS completed reviews of intra-laboratory check sample results for the entire Eighth Term contract period.
<b>National Association of Testing Authorities accreditation of contract laboratories</b>	All NRS-contracted laboratories must achieve and maintain NATA (or equivalent) accreditation, unless they are exempt due to exceptional circumstances, and they must operate within a comprehensive quality assurance/quality control system. NRS continued to check quality assurance regularly during the Eighth Term contract period.
<b>Performance monitoring using proficiency testing</b>	Contracted laboratories analysed standard sets of samples that were either residue-free or had been spiked with a known amount of residue or residues. All PT samples were prepared by NRS staff at the Australian National University laboratory facilities in Canberra. NRS assessed laboratories for their ability to detect, identify and quantify any residues present in the samples and appropriately report these results.
<b>Effective assessment of laboratory performance</b>	Either NRS or the NRS Laboratory Performance Evaluation Committee assesses all PT results. The LPE Committee is chaired by the manager of the NRS residue chemistry and laboratory performance evaluation team (NRS RC-LPE) and includes representatives from Proficiency Testing Australia, the National Measurement Institute, the Therapeutic Goods Administration and an independent chemical consultative organisation, with support from officers employed by NRS.
<b>Required standards of analysis maintained</b>	During 2007–2008, PT, laboratory visits and data reviews were successfully carried out to ensure that required standards of analytical performance expected of a NRS contract laboratory were maintained for all laboratories delivering analytical services to NRS.

## PERFORMANCE INDICATOR TWO

Procurement of laboratory services that provide the best value for money and meet corporate governance requirements.

### Achievements

#### Contract laboratory visits

NRS RC-LPE staff members visited a number of Eighth Term contract laboratories (on some occasions accompanied by an AQIS officer) to:

- ensure that laboratories delivered analytical services at the required performance level
- ensure that laboratories delivered analytical services to the satisfaction of AQIS oversight requirements
- answer any queries from contract laboratories regarding the operational requirements of the contract.

#### Performance of NRS Eighth and Ninth Term contracted laboratories

The Eighth Term contract laboratories continued to deliver value-for-money analytical services at the required quality level until the end of the contractual period (30 June 2008). NRS conducted a thorough selection process and carried out pre-tender proficiency testing to ensure that successful Ninth Term contracted laboratories will continue to deliver these services from 1 July 2008 to 30 June 2011.

#### Preparation for Ninth Term laboratory contracts (2008–2011)

The selection of the Ninth Term contract laboratories was finalised in February 2008. The new contracts started on 1 July 2008 and will run until 30 June 2011.

The process used by NRS to select laboratories included the following steps:

- determining the residue testing requirements for animal and plant products (by NRS project managers in consultation with industry)
- publishing the *Proficiency Test Handbook* (10<sup>th</sup> edition), which advises laboratories of the specifications for the analytical programs on offer for the Ninth Term contract period
- seeking expressions of interest via the AusTender website<sup>1</sup> according to Australian Government purchasing requirements, and providing the request-for-tender document to all laboratories submitting an expression of interest
- collating and evaluating the results of laboratories participating in the relevant pre-tender PT rounds
- assessing laboratory pre-tender PT results and ranking laboratory performance (by the NRS LPE Tender Evaluation Panel)
- receiving tender submissions from laboratories
- evaluating tender submissions against criteria specified in the request for tender, including laboratory performance in the pre-tender proficiency rounds, laboratory management, staffing, equipment and facilities, quality control systems, accreditation status, appropriateness of analytical methods and pricing (by NRS and the Tender Evaluation Panel)
- notifying the successful tendering laboratories of the outcome of the tender evaluation process
- sending contracts to successful laboratories in time for the sign-off by 30 June 2008, for three years to 30 June 2011.

#### Selection of laboratories for *ad hoc* contracts

NRS obtained laboratory services for a number of small NRS testing projects. Laboratories were selected based on their evaluation against the NRS technical and value-for-money requirements.

#### Updated NRS laboratory guidelines for contract laboratories

NRS updated the *National Residue Survey Laboratory Guidelines* (July 2008) and sent the updates to the contract laboratories. These guidelines contain all specifications and requirements for laboratory analyses and reporting to be undertaken by the contract laboratories during the Ninth Term contract period. A copy of the guidelines was sent to each contracted laboratory before the contracts commenced. The *National Residue Survey Laboratory Guidelines* is a controlled document, and NRS verifies that the updates sent to each contract laboratory are appropriately included.

<sup>1</sup> [www.tenders.gov.au](http://www.tenders.gov.au)

**PERFORMANCE INDICATOR THREE**

Validation that laboratory assessments in proficiency tests accord with agreed scientific standards.

**Achievements**

<b>National Association of Testing Authorities proficiency testing accreditation</b>	The NRS system of residue chemistry and laboratory performance evaluation was reassessed in April 2007 by NATA against the relevant international standard (ILAC G: 13 2000). NRS was granted a continuation of accreditation as a proficiency testing scheme provider. Accreditation has been maintained since July 2005.
<b>Acceptance of NRS data</b>	The validity of NRS data continued to be accepted by overseas clients, as well as international organisations such as the Codex Alimentarius Commission.

**PERFORMANCE INDICATOR FOUR**

Approval by domestic and overseas clients of the NRS system of using outsourced laboratory services based on public tender, proficiency testing and ongoing monitoring of performance.

**Achievements**

<b>United States Department of Agriculture Food Safety Inspection Service equivalence</b>	The United States Department of Agriculture continues to formally recognise the technical equivalence of methods used by, and results generated by, NRS contract laboratories in residue testing programs.
<b>European Union and other trading partners</b>	The European Union and other trading partners (e.g. Japan and Korea) continue to recognise that results generated by NRS contract laboratories are of equal technical validity to results generated by their own laboratories.

**PERFORMANCE INDICATOR FIVE**

Responsiveness to emerging needs in a timely and effective manner.

**Achievements**

<b>Procurement of laboratory services outside the formal tendering process</b>	In response to emerging needs, NRS obtained laboratory services for a number of programs that were not formally part of the tendering process. These included: <ul style="list-style-type: none"> <li>• nitrofurans metabolites in pig retina</li> <li>• malachite green in fish</li> <li>• lead in liver.</li> </ul>
<b>Ensuring continued access to export markets</b>	In response to changing export market requirements, NRS increased the suites of analytes covered by some NRS contract laboratories and, at the same time, lowered some detection limits.
<b>Maintenance of laboratory capacity</b>	To ensure that laboratory capacity is maintained, NRS split a number of NRS contracts between two laboratories for the Ninth Term contract.
<b>Visits to European laboratories for information updates</b>	In conjunction with the <i>EuroResidue VI</i> conference, a NRS officer visited four European laboratories (two in Holland, one in Northern Ireland and one in Britain) in order to gain knowledge of current trends and developments in the analysis of chemicals in food matrices, and to discuss matters regarding proficiency testing. One of the laboratories is responsible for testing Australian imports into the EU.

## Outlook

### Reassessment of NATA accreditation

Routine reassessment of the NRS RC-LPE section's accreditation as a provider of proficiency testing schemes will occur in late 2008.

### Maintenance of required laboratory standards

Laboratory visits and data reviews will continue to ensure that required analytical performance standards are being met.

## Externally funded laboratory performance evaluation

### Description

Laboratory performance (and therefore evaluation) underpins the validity of NRS residue testing programs. NRS conducts proficiency testing (PT) and laboratory performance evaluations in the course of contracting laboratories to undertake analysis of samples for the NRS animal and plant random monitoring programs. Laboratory performance is important for the efficiency and acceptability of industry-operated monitoring projects and quality assurance systems. These projects require cost-effective analytical laboratories and confidence in the validity of the analytical results produced.

On the basis of meeting the requirements set out in the International Laboratory Accreditation Cooperation (ILAC) G: 13 document *Guidelines for the Requirements for the Competence of Providers of Proficiency Testing Schemes*, the National Association of Testing Authorities (NATA) accredited NRS as a PT Scheme Provider. Accreditation to this international standard also supports the provision by NRS of laboratory evaluations for industry clients under contract on a fee-for-service basis, at full cost-recovery.

### Outputs

Externally funded laboratory performance evaluation by NRS aims to provide:

- increasing national and international confidence in, and acceptance of, industry-operated monitoring systems and quality assurance schemes
- support for NATA's accreditation activities relating to analytical testing laboratories
- maximisation of the national benefits resulting from NRS 'in-house' expertise and experience.

### Dairy project

During 2007–2008, NRS continued contractual laboratory performance evaluations for the dairy industry. The primary purpose of the dairy project is to verify the standard of performance of laboratories contracted for the Australian Milk Residue Analysis (AMRA) survey. Dairy Food Safety Victoria (DFSV), which coordinates the AMRA survey on behalf of the Australian Dairy Authorities Standards Committee, has agreed to the details of a proposed laboratory performance evaluation arrangement for 2008–2009.

## Wool project

During 2004–2005, Australian Wool Innovation Limited (AWI) contracted NRS to provide a PT service for three years, involving both national and international laboratories that test raw wool for residues of pesticides and insect growth regulators. Satisfactory performance in ongoing PT will also become mandatory for any laboratory wishing to be licensed by the International Wool Textile Organisation (IWTO) for testing raw wool for chemical residues. The wool testing program is seen by both AWI and IWTO as central to all efforts to identify and market low-residue wools and ‘ecowools’ globally, and to ensure that the wool trade can rely on testing from all parts of the global supply chain.

Australia, as a supplier of clean wool to the world, has a significant interest in providing assurance to customers that the claimed residue status of its wool is correct. It is equally important that chemical analyses from laboratories in other wool-growing countries can also be demonstrated to be technically valid.

NRS’s involvement in this project concluded in October 2007, with the completion of the final PT round.

## Performance

### PERFORMANCE INDICATOR ONE

Compliance with contracts with individual industries.

### PERFORMANCE INDICATOR TWO

Clients’ satisfaction with the services provided.

#### Achievements

##### **Milk laboratory performance evaluation**

NRS completed two milk LPE rounds for the laboratories contracted by DFSV in September 2007 and March 2008, respectively. Reports for each round were provided to DFSV within the scheduled timeframe, and DFSV was satisfied with the service provided. ‘Blind’ samples were also used by NRS to evaluate laboratory performance in testing programs for which formal PT was not available.

##### **Wool laboratory proficiency testing**

NRS completed the final wool PT round for laboratories within the project during October 2007 and submitted PT and final project reports to AWI within the scheduled timeframe. All scheduled milestones were met, and AWI approved the reports.

## Outlook

### Milk laboratory performance evaluation

DFSV again contracted NRS to provide a milk LPE program involving two rounds in 2008–2009.

