



Residue chemistry and laboratory performance evaluation

National Residue Survey 2008–2009

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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 as 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 Ninth Term contracts commenced on 1 July 2008 and will terminate on 30 June 2011. Laboratory PT takes place regularly throughout the contract period to ensure the analytical performance of all NRS contract laboratories meet NRS requirements. Other performance evaluation processes used by NRS include an intra-laboratory check sample program; assessment of analytical methods; on-site visits and audits, and submission of blind samples for analysis.

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 various 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

NRS maintained accreditation as a proficiency test scheme provider following a 2008 routine reassessment against the relevant international standard by NATA.

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

Procurement of laboratory services for a number of *ad hoc* testing projects was carried out successfully.

Arrangements were implemented to procure analytical services for Program 1 (Antimicrobials in kidney, poultry liver and eggs) to replace a contract laboratory that withdrew its services.

New PT schemes were developed and implemented concerning melamine in milk for AQIS, and multi-residues and metals in almonds for the almond industry.

A new chemical standards database was commissioned to facilitate documentation and traceability of standards used to spike PT samples.

Performance

For the laboratory performance evaluation and 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 PT and in contracted work accord with agreed scientific standards
- acceptance by domestic and overseas stakeholders of the NRS residue testing program that 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

Intra-laboratory check sample data	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 2008–2009. NRS completed reviews of intra-laboratory check sample results for the Ninth Term contract period to date. All laboratories met the required NRS standards.
National Association of Testing Authorities (NATA) accreditation of contract laboratories	All NRS contract 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 Ninth Term contract period. All laboratories met NRS requirements.
Performance monitoring using proficiency testing	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. All laboratories met the required NRS standards. NRS also met NATA requirements to maintain its accreditation as a proficiency testing scheme provider.
Effective assessment of laboratory performance	Either NRS or the NRS laboratory performance evaluation (LPE) committee assesses all PT results. The LPE committee is chaired by the manager of the NRS residue chemistry and laboratory performance evaluation team (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. The LPE committee met on three occasions (one teleconference and two face-to-face meetings) to assess the results from laboratories participating in NRS-run PT programs.
Blind samples of incurred residues	Samples with incurred residues of ractopamine were submitted to the two NRS laboratories with contracts for β -agonists. Both laboratories correctly identified and reported the presence of the analyte, thereby demonstrating satisfactory performance in the analysis of blind samples.
Required standards of analysis maintained	During 2008–2009, proficiency testing, 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 Ninth Term contract laboratories (on some occasions accompanied by an AQIS officer) to: <ul style="list-style-type: none"> 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 Ninth Term contracted laboratories	The Ninth Term contract laboratories delivered value-for-money analytical services at the required quality level.
Procurement of replacement laboratory for Program I (Antimicrobials in kidney, poultry liver and eggs)	The RC-LPE section sought expressions of interest from contract laboratories to develop the analytical capability required for the analysis of samples for Program I (antimicrobials in kidney, poultry liver and eggs), following withdrawal of services by a contract laboratory. The successful replacement laboratory will be given six months to fully validate appropriate microbial inhibition assays and instrumental confirmatory methods with a view towards starting analysis of a proportion of Program I samples from 1 January 2010.
Selection of laboratories for <i>ad hoc</i> contracts	NRS procured laboratory services for a number of small projects involving horticulture and aquaculture commodities. Laboratories were selected based on their evaluation against NRS technical requirements and value-for-money.

PERFORMANCE INDICATOR THREE

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

Achievements

National Association of Testing Authorities proficiency testing accreditation	The NRS system of residue chemistry and laboratory performance evaluation was reassessed in November 2008 by NATA against the relevant international standard (LAC G: 13 2008). NRS was granted a continuation of accreditation as a proficiency testing scheme provider. Accreditation has been maintained since July 2005.
Acceptance of NRS data	The validity of NRS data continues 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

United States Department of Agriculture Food Safety Inspection Service equivalence	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.
Russian delegation audit of NRS contract laboratories	Members of a Russian delegation audited two NRS contract laboratories in early 2009 – no issues of concern were identified.
European Union (EU) and other trading partners	The EU and other trading partners (e.g. Japan, Korea, Russia) continue their recognition 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

Procurement of laboratory services outside the formal tendering process	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"> • nitrofurans metabolites in beef retina • pesticides, herbicides, dithiocarbamates, metals and phosphine in almonds • metals, pesticides, dioxins, phenolics, nitrofurans and malachite green in aquaculture.
Ensuring continued access to export markets	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.
Maintenance of laboratory capacity	To ensure that laboratory capacity is maintained, NRS split a number of NRS contracts between two laboratories for the Ninth Term contract.
Attendance at external forums	NRS officers presented at various forums including the Codex Stakeholders Forum, NATA's Proficiency Testing Forum and the 11th Government Food Analysts' Conference.

Outlook

Reassessment of NATA accreditation

NATA have once again accredited the NRS RC-LPE section as a provider of proficiency testing schemes. The next reassessment of the NRS RC-LPE section's accreditation will take place in April 2010.

Continuance of required laboratory standards

Laboratory visits and data reviews will ensure that required analytical performance standards are being met. Attendance at relevant national and international conferences, as well as visits to relevant national and international laboratories and organisations will ensure that NRS remains up-to-date with the latest trends in analytical chemistry and maintains its network of colleagues with expertise in analytical chemistry, PT and quality assurance systems.

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 2008–2009, 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 a proposed laboratory performance evaluation arrangement for 2009–2010.

Melamine in milk project

During 2008–2009, NRS conducted a melamine in milk proficiency testing program for AQIS. Seven laboratories across Australia and New Zealand participated in this program. The PT program was developed following a global food contamination incident involving melamine and cyanuric acid which gave rise to a dramatic increase in the requirement for the provision of analytical services involving these compounds.

In response to the increased demand for this testing service, laboratories globally began developing and validating methods for these analytes in several milk-based products. In Australia, testing of imported food commodities likely to be contaminated with melamine was rapidly escalated by AQIS and Food Standards Australia and New Zealand. As testing for these analytes in milk-based products was not generally covered by routine methods, laboratories necessarily validated methods 'on-the-run'. Consequently, AQIS commissioned NRS to implement a small PT program involving melamine and cyanuric acid in liquid milk as the basis for granting laboratories approval to test samples under the AQIS Imported Food Inspection Scheme. The NRS PT program formed the basis for assessing the analytical capability of laboratories involved in testing samples as *AQIS Appointed Analysts*.

Performance

PERFORMANCE INDICATORS ONE AND TWO	
Compliance with contracts with individual industries and 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 were satisfied with the service provided to them. 'Blind' samples were also used by NRS to evaluate laboratory performance in testing programs for which formal PT was not available.

Outlook

Milk laboratory performance evaluation

DFSV has again contracted NRS to provide a milk LPE program involving two rounds in 2009–2010.