



Northern Ireland Audit Office

The Agri-Food and Biosciences Institute (AFBI)



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Northern Ireland Audit Office

The Agri-Food and Biosciences Institute (AFBI)

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Northern Ireland Audit Office

Comptroller and Auditor General

12 September 2013

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Abbreviations

AFBI	Agri-Food and Biosciences Institute
ALB	Arms Length Body
ARINI	Agricultural Research Institute of Northern Ireland
ASB	AFBI Sponsor Branch
BP	Business Plan
CAFRE	College of Agriculture, Food and Rural Enterprise
CAP	Common Agricultural Policy
DARD	Department of Agriculture and Rural Development
DEFRA	Department for Environment, Food and Rural Affairs
DFP	Department of Finance and Personnel
DSA	Departmental Scientific Advisor
EIS	Evidence and Innovation Strategy
EU	European Union
FEA	Full Economic Appraisal
FMMS	Financial Memorandum and Management Statement
GB	Great Britain
GVA	Gross Value Added
ISO	International Organization for Standardization
MoU	Memorandum of Understanding
NDPB	Non-Departmental Public Body
PAC	Public Accounts Committee
PPE	Post Project Evaluation
PMB	Programme Management Board
REAP	Research and Education Advisory Panel
R&D	Research and Development
SLA	Service Level Agreement
TSE	Transmissible Spongiform Encephalopathy
VSD	Veterinary Science Division
WTO	World Trade Organization

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Background

1. The Agri-Food and Biosciences Institute (AFBI) was established in 2006. A Non-Departmental Public Body of the Department of Agriculture and Rural Development (DARD), it undertakes scientific work in agriculture; animal health and welfare; food; fisheries; forestry; the natural environment; and rural development and enterprise. The majority of AFBI's work is funded by, and undertaken on behalf of, DARD. Between 2006-07 and 2011-12, AFBI received £253 million grant-in-aid funding from DARD.
2. Almost 60% of AFBI's costs have been incurred on scientific testing for DARD, which aims to support the diagnosis and control of major animal disease; to detect changing animal disease patterns; and to provide assurance on the safety of food products. Around 20% is accounted for by the provision of research and development (R&D) services, which is intended to align with DARD's strategic goals.
3. In addition to the services delivered for DARD, AFBI undertakes work for commercial clients. Since its establishment, AFBI has generated £68 million in commercial income.

Financial Management

4. Like the rest of the public sector, AFBI has recently faced considerable financial challenges because of the tighter public expenditure climate. It has delivered

some notable achievements in response to this. For example, AFBI told us that from 2006-11, it had absorbed £7 million of inflationary pressures and delivered £3 million of efficiency savings.

5. While this is welcome, we consider there is scope for further efficiencies. Less than half of AFBI's expenditure is directly incurred on its main operational activities. The remaining indirect expenditure (£143 million between 2006-07 and 2010-11) comprises 'other costs' and 'corporate costs'. In particular, a high proportion of overall costs are being incurred in respect of the lease of AFBI's estate from DARD, energy and water usage, and on operational management. AFBI is currently considering a number of options which could yield long-term savings in the costs associated with its estate.
6. The very high proportion of indirect expenditure which is unallocated against AFBI's operational activities means that the full costs of delivering these are not known. It is therefore important that such overheads are allocated more accurately. Indirect costs are charged to customers through the application of AFBI's overhead rate, but this is a generic rate which does not differentiate between, or reflect the true cost of, its widely differing activities. We consider that this creates risks to value for money:
 - there is little incentive to control overhead costs within individual AFBI Divisions, as these can be absorbed elsewhere;

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- there is a risk of cross subsidisation;
- appropriate fees, based around full cost recovery and (where relevant) profit, may not always be charged in all individual cases; and
- management are not sighted on the true cost of the activities being undertaken, and the value for money being provided.

7. AFBI is currently developing a sophisticated charging model which will more precisely allocate and apportion indirect overhead costs and enable the actual costs of its differing activities to be more accurately identified. It will also enable AFBI to set fees which more accurately reflect such costs.
8. Until April 2011, AFBI did not always charge fully for the overhead costs it bears, but instead used a historical general overhead rate (based on one of its predecessor organisations). As this did not accurately reflect AFBI's overhead costs, we estimate that the Institute may have lost £3.5 million income between April 2006 and March 2011. AFBI highlighted that this represented 1.5% of total grant-in-aid provided by DARD during this period.
9. Aside from DARD grant-in-aid, AFBI generates income from a range of other sources, including contracts for which fees are mainly agreed with clients 'up-front', on the basis of estimated staff time required to complete the work. In

2010-11, the value of these contracts was £3.8 million. To date, AFBI has not analysed the variance between estimated and actual staff time taken on commercial contracts, nor reconciled actual costs incurred against fees charged. In the absence of variance analysis, we consider that there is a risk that inaccurate forecasting could lead to significant under-charging.

Performance Reporting

10. Since its establishment, AFBI has reported performance annually through a framework of Business Plan targets. Between 2008-09 and 2010-11, AFBI fully achieved almost 80% of its targets, and partially achieved a further 10%. A key target to increase its level of non-DARD income has consistently been met, with revenue increasing from £6.3 million in 2006-07 to £16.8 million in 2011-12.
11. Scientific testing is AFBI's largest business activity, with 2.3 million statutory tests carried out in 2010-11. AFBI's monitoring shows a generally high performance in delivering all the key high-volume tests to required time-scales and quality standards. Whilst AFBI has reported that its testing has been delivered to internal quality standards, only 50% of tests covered by EU legislation had achieved ISO accreditation at February 2011. By July 2011, this had increased significantly to 99%.

12. Around £143 million was spent on scientific testing between 2006-07 and 2010-11. However, AFBI has not established any targets nor reported performance in terms of the cost of this activity. AFBI told us that the overall cost of service provision has been available since its establishment in April 2006. However, in the current economic climate, public sector bodies need to measure and demonstrate efficient use of resources. Unit costs represent a basic efficiency measure, but, to date, DARD has only required AFBI to produce these for a limited number of tests performed for it, and it has not benchmarked AFBI's costs for delivering scientific testing with other organisations.

13. The Department and AFBI told us that benchmarking costs is problematic and that the complex nature of some of its testing does not lend itself to unit costing. While there may be some difficulties in this area, we consider that the limited availability of unit costs and lack of benchmarking makes it difficult for DARD to demonstrate that it is receiving best value for money in return for the significant funding provided to AFBI for scientific testing.

14. AFBI's Business Plan targets for its R&D activities have focused on the quality of the work undertaken. While this is extremely important, cost and timeliness are also key indicators. AFBI had set no targets for measuring the delivery of R&D projects within budget and time-scales until 2011-12, when it introduced a measure which requires it to monitor

R&D projects in line with milestones and report year end outcomes to DARD. It is too early to establish whether this has resulted in stronger project management being applied to the R&D programme, and whether delivery of R&D to cost and time budgets has improved.

15. It is welcome that AFBI has measured performance consistently in some key strategic areas and met the majority of its business targets. However, we consider that there is scope to improve the organisation's performance measurement and target-setting regime. In particular:

- targets are predominantly activity-based and not sufficiently focused on outputs or outcomes;
- some targets have not been sufficiently challenging; and
- there is no clear alignment between AFBI's targets and its contribution to DARD's goals.

The Management of AFBI's Research and Development Activities

16. A key aspect of AFBI's work for DARD has involved delivering a programme of R&D which is intended to support DARD's main strategic goals. In the course of our fieldwork, DARD introduced new arrangements for planning, appraising, monitoring and evaluating the R&D work procured from AFBI. These have the potential to improve the efficiency and effectiveness of the R&D programme. However, given the relatively long

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life cycle of R&D projects, the new arrangements were not fully bedded in at the time of our study, and it was too early to meaningfully assess their impact.

17. In examining a total of 125 R&D projects (45 completed and 80 which were still ongoing), we found indicators of poor management and control over these projects. For example:

- almost a third of projects reviewed should have been subject to full appraisal but were not, because the initial cost estimates were significantly lower than actual costs subsequently incurred. These projects were, instead, subject to less detailed appraisals;
- actual costs incurred in 60% of the projects we examined significantly exceeded the initial cost estimates. The actual costs in these projects were some £12.7 million greater than their original estimates;
- there was a lack of appropriate project monitoring and review. We saw no evidence that AFBI had been routinely generating information on the costs incurred in its individual R&D projects;
- R&D projects had not been delivered to initial deadlines established at the outset. As AFBI did not record precise dates for the expected start and end of projects at the outset, the forecast duration of these could not be definitively calculated.

However, available records showed the average duration for completed projects was 5.4 years, compared with an estimated 2.2 to 3.2 years; for the 80 live projects, their average actual duration at May 2011 was 4.8 years, compared with the estimate of 2.5 to 3.6 years. AFBI told us that the additional costs and longer time taken to progress projects were mainly due to the scope of the projects being extended through an annual review process; and

- completed projects are expected to undergo post project evaluations (PPEs). At May 2011, no PPEs had been carried out for these projects. AFBI told us that it had not commenced any PPEs because sufficient time (three years) had not elapsed for research findings to translate into the agri-food environment, and for all benefits to have been realised.

18. Since our fieldwork, DARD has introduced quarterly and annual review of spend against budgets, and tracking of progress against key milestones for all newly commissioned R&D projects. DARD also told us that PPEs had now been finalised for 19 completed projects, with a further 26 scheduled, and that PPEs will also be undertaken for all ongoing projects.

19. As far back as 1995, the Westminster Public Accounts Committee highlighted particular issues around a long-running potato breeding project, which had

commenced in 1957, and noted that the Department needed to put “in place robust controls to prevent long-term research projects continuing indefinitely where they are not delivering results”. Eighteen years later, and 56 years after it commenced, this project remains ongoing. Furthermore, the lack of significant market success highlighted by PAC has not been addressed – seed potato production in Northern Ireland has declined from 157,000 tonnes in 1982 to 20,200 tonnes in 2010. DARD attributed this to commercial pressures on the industry, rather than a lack of impact of AFBI’s breeding programme. DARD has recently secured commercial support as part of a re-organisation of the project, but has also acknowledged that this represents a “last best chance” for the Northern Ireland seed potato industry.

20. To measure the value of its R&D programme, AFBI has placed significant reliance on the peer review and publication process. AFBI has published 836 peer-reviewed articles and has also participated in almost 1,900 knowledge and technology transfer events to the agri-food industry. AFBI also provided examples of individual R&D projects which had delivered net financial benefits. However, as PPEs have not yet been completed for the majority of DARD-funded projects, the level of financial and other benefits from the wider research programme is unclear.

Governance and Oversight Arrangements

21. In line with good practice, DARD put in place a number of governance and oversight arrangements for AFBI. In early 2004, it established a Project Board to oversee AFBI’s establishment and in January 2007 it finalised a Financial Memorandum and Management Statement, a key element of a strong governance and accountability framework. On AFBI’s establishment, DARD also set up a dedicated sponsor branch to exercise ongoing oversight. DARD has also held formal and regular governance meetings with AFBI since 2006.
22. DARD has continued to strengthen its governance and oversight arrangements over AFBI’s lifetime. For example, in April 2012, the Department issued a manual which formally set out its approach to sponsorship and governance of Arm’s Length Bodies (ALBs). This contains wide-ranging guidance on how DARD should exercise oversight over ALBs.
23. While these are welcome developments, it is nevertheless clear that the DARD was slow to put in place the full extent of oversight and governance necessary for such a large NDPB. For example:
- DARD intended having a formal and fully costed work programme in place for AFBI’s establishment in April 2006. Problems with generating the required financial and costing information and a need to improve financial systems meant that this was only introduced in 2010-11. A

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strategic cost model, introduced in December 2012, will enable AFBI, for the first time, to identify more precisely the specific costs incurred by its different divisions;

- A Memorandum of Understanding (MoU) sets out the key principles upon which a customer-contractor relationship operates, and although not mandatory, it helps such a relationship to function effectively. A draft MoU between DARD and AFBI was produced in March 2008, but the final document was only formally agreed in June 2012. In the absence of a MoU, Service Level Agreements covering the different elements of work were established in March 2010. Until this date, therefore, there was no formal documented basis defining how the customer-contractor relationship between DARD and AFBI would work;
- There have been long-standing difficulties regarding the quality of financial information. Until 2010-11, DARD considered that finance reports being provided by AFBI were insufficient to meet the Department's requirements. Although a Finance sub-committee established by AFBI's Board in April 2011 has sought to secure improvements to the quality of AFBI's financial information and reporting, further concerns over the timeliness and accuracy of management information were identified by Internal Audit in 2011-12; and
- In June 2009, DARD launched its Evidence and Innovation Strategy (EIS) to ensure that R&D commissioned from AFBI was fully commensurate with DARD's strategic objectives. However, the first programme of EIS projects was not approved by DARD until 2011-12. A supplementary review of 79 ongoing R&D projects resulted in around two-thirds of these being immediately terminated.

24. Overall, we believe that the development of a strong and comprehensive corporate governance framework for AFBI has been a prolonged process, with a formal work programme and improved financial reporting and business planning only achieved five years after the Institute's establishment.



Part One: Introduction and Background



Part One: Introduction and Background

The agri-food industry contributes to Northern Ireland's economy, and AFBI has a role in protecting and developing the sector

1.1 The agri-food sector is a significant part of the Northern Ireland economy. It generates almost £4 billion in annual sales; contributes almost £1.1 billion a year in Gross Value Added (GVA)¹; and employs 52,000 people. The economic impact of the sector is proportionately greater than in the United Kingdom as a whole (**Figure 1**).

Figure 1: Contribution of the agri-food sector to the Northern Ireland and UK Economies 2010-11

Contribution of the agri-food Industry	Northern Ireland %	UK %
GVA as a proportion of total GVA to the economy	3.9	2.3
Employment as a proportion of total employment	6.5	2.6

Source: DARD Agricultural Economy Branch

1.2 The Department of Agriculture and Rural Development (DARD or the Department) has primary responsibility for food, farming, environmental policy and the development of the rural sector in Northern Ireland. One of DARD's key objectives is to assist the agri-food sector and it funds the Agri-Food and Biosciences Institute (AFBI or the Institute) to help meet this objective.

1.3 Established as a Non-Departmental Public Body (NDPB) in 2006, AFBI's

function is to undertake scientific work in agriculture; animal health and welfare; food; fisheries; forestry; the natural environment; and rural development and enterprise. This work is primarily delivered for DARD on a statutory basis, through an annual work programme which involves the provision of analytical and diagnostic scientific services, scientific research and development and a scientific emergency response capability. To a lesser degree, AFBI also carries out scientific work for other government bodies and the agri-food industry.

- 1.4 AFBI's analytical and diagnostic testing for DARD and other public and commercial bodies aims to satisfy local, national and EU statutory requirements. This work helps to:
- facilitate rapid diagnosis and control of major animal and plant disease outbreaks, including those posing a risk to human health;
 - detect changing animal and plant disease patterns, and the emergence of new diseases;
 - provide assurance on the safety of food products;
 - monitor plant health; and
 - maintain healthy fish stocks.

1.5 AFBI's research and development (R&D) on behalf of DARD is intended to align with the Department's main strategic goals of:

¹ Gross Value Added measures the contribution to the economy in terms of goods and services produced, in respect of each individual producer, industry or sector.

- improving market place performance;
- strengthening the social and economic infrastructure of rural areas;
- enhancing animal, fish and plant health and welfare; and
- developing a more sustainable environment.

1.6 Work undertaken by AFBI for other Government bodies and commercial clients (mainly agri-food manufacturing and processing companies and private veterinary practices) is primarily associated with analytical and diagnostic testing services, and R&D aimed at improving market place performance.

1.7 Aside from its ongoing work programme, AFBI needs to maintain the skills and facilities necessary to provide an emergency response to counter threats to animal and plant health and the food chain. Examples of such threats include the 2001 Foot and Mouth crisis and the bluetongue virus and dioxins incident of 2008 that affected animal feedstuffs. AFBI's statutory testing and disease surveillance activities help to act as an early warning mechanism for such outbreaks, and also provide assurance on the safety of local food produce, thus helping protect important export markets for Northern Ireland.

Between 2006-07 and 2011-12, AFBI received £253 million grant-in-aid from DARD. This accounted for almost 80 per cent of its funding

1.8 Between 2006-07 and 2011-12, AFBI expenditure totalled £316 million. During this period, the Institute received total income of £321 million, £253 million (79%) of which was grant-in-aid from DARD. Average employment in 2010-11 was 868 (whole-time equivalents). In both expenditure and employment terms, AFBI is the largest of DARD's Arms Length Bodies (ALBs), and a significant amount (£10.6 million) and proportion (19%) of the Institute's expenditure in 2010-11 was spent on the leasing and running costs of the AFBI estate which is spread across seven locations in Northern Ireland². **Figure 2** provides an annual breakdown of total expenditure, grant-in-aid received from DARD and other income collected by AFBI between 2006-07 and 2011-12.

1.9 Estimates provided by AFBI for NIAO as part of this review, indicate that, between 2006-07 and 2010-11, the share of total costs was:

- statutory testing for DARD 57%;
- R&D work for DARD 22%;
- commercial work³ 17%; and
- specialist advice to DARD 4%.

2 AFBI's headquarters are located at Newforge Lane in Belfast. It also has operational sites at Stormont, Crossnacreevy, Hillsborough, Loughgall, Omagh and Bushmills.

3 The Agriculture Order (2004) NI defines commercial work to be undertaken by AFBI as all work not funded through grant-in-aid. This includes non grant-in-aid work for DARD and other Government Departments and public bodies, income from farming activities, work for private sector clients, and work for national and international public and private sector bodies.

Part One: Introduction and Background

Figure 2: Breakdown of AFBI Expenditure and funding (2006-07 to 2011-12)



Source: AFBI Annual Accounts

However, there are limitations with this analysis, as it is based on staffing and consumable costs which comprise only 45% of AFBI's total expenditure. The remaining 55% of costs are not easily apportioned, and to date, AFBI has not fully developed systems which ensure precise allocation of these. Instead, AFBI has allocated these through a generic overhead rate when charging customers for work.

We undertook this study because AFBI is a relatively new organisation; it is DARD's largest NDPB; and because Science Service's delivery of R&D for DARD was previously criticised by the Public Accounts Committee at Westminster

1.10 We undertook this study because as a relatively new organisation, AFBI carried a high degree of risk. AFBI is also significantly the largest of DARD's ALBs in both expenditure and employment terms.

1.11 We were also mindful that, in May 1995, a Westminster Public Accounts Committee (PAC) report⁴ assessed DARD's Research and Development (R&D) activities, which were then the responsibility of the Science Service. This report identified the following specific issues:

- expenditure of £43 million by DARD on R&D between 1988 and 1993, without having a proper strategic plan, or any other formal mechanism for determining research needs and priorities;
- inadequate economic appraisal of R&D projects, and a lack of detailed analysis of the benefits being delivered from this work;
- no reliable costing system to help facilitate the effective control of R&D expenditure;
- R&D projects being allowed to continue indefinitely, despite no evidence that these were delivering tangible results; and
- a lack of performance targets and cost budgets, meaning that Science Service was unable to justify the lengthy time taken to complete research work.

1.12 In broad terms, the Northern Ireland Audit Office's (NIAO's) review focused on:

- financial management within AFBI;

- performance management within AFBI;
- AFBI's planning and management of DARD-funded R&D projects; and
- corporate governance within AFBI and oversight of the Institute by DARD.

Our review did not take account of the operations of the College of Agriculture, Food and Rural Enterprise (CAFRE), a discrete business area of DARD, which provides education and training programmes as well as undertaking business development and technology transfer work in the agricultural land-based and food industries.

1.13 To obtain the necessary evidence to inform this review, we undertook the following work:

- structured interviews with AFBI staff to discuss operational and financial management, and the procedures for managing and monitoring the R&D work programme;
- analysis of AFBI management information to assess the robustness of procedures for setting fees for commercial work; the degree to which AFBI has achieved key business targets; and whether DARD-funded R&D projects have been delivered within budget and time-scale;

4 Committee of Public Accounts Session 1994-1995 Seventeenth Report – Department of Agriculture for Northern Ireland: Science Service Research and Development.

Part One: Introduction and Background

- review of DARD documentation to assess the strength of the Department's oversight and governance over the financial and operational management of AFBI; and
 - review of other relevant literature to identify previous conclusions in this area by PAC, and identify best practice and mandatory requirements for financial management of ALBs.
-



Part Two: Financial Management within AFBI



Part Two: Financial Management within AFBI

Corporate costs account for a high percentage of AFBI's expenditure, and there may be potential for further efficiencies in this area

2.1 It is important that public sector organisations are fully sighted on the costs of their activities, so that opportunities for efficiency savings can be identified and realised. AFBI told us that between 2006-07 and 2010-11, it delivered £3 million of efficiency savings and absorbed £7 million of inflationary pressures, as well as significantly growing its non-DARD income (from £6.3 million in 2006-07 to £16.8 million in 2011-12). In addition, AFBI told us that it introduced a 'strategic

cost model' in December 2012. This will enable AFBI to more accurately allocate and apportion its corporate and overhead costs, thereby ensuring more precise charging for individual customers.

2.2 AFBI has separate systems which provide details of staff and non-staff costs. It has not, however, routinely prepared management information breaking down the total costs of its different elements of work. We therefore asked AFBI to provide us with such analysis. The figures provided, which were for 2006-07 to 2010-11, are detailed in **Figure 3** below:

Figure 3: Breakdown of AFBI's expenditure by activities: 2006-07 to 2010-11

Year	Statutory Testing (DARD) £m*	R&D (DARD) £m*	Commercial £m*	Advice/Teaching £m*	Total Staff, Consumable and Other Costs £m*	Other and Corporate Costs £m**	Total Costs £m
2006-07	10.86	4.15	2.67	1.16	18.84	19.74	38.58
2007-08	12.43	5.40	3.36	1.05	22.24	32.95	55.19
2008-09	13.64	5.85	4.26	0.83	24.58	30.52	55.10
2009-10	14.19	5.62	4.25	0.75	24.81	30.14	54.95
2010-11	14.16	4.63	4.95	0.74	24.48	29.98	54.46
Total	65.28	25.65	19.49	4.53	114.95	143.33	258.28

Source: AFBI

* costs for staff and consumable items sourced from AFBI's time recording and accounting systems.

** other costs include annual leave, public holidays, sickness absence and costs relating to Health and Safety and quality assurance. Whilst these have not been allocated directly to operational activities, costs were recovered from customers through AFBI's overhead charge. Corporate costs include those for agency staff, a one-off pension adjustment in 2006-07 arising from the dissolution of the Agricultural Research Institute Northern Ireland (ARINI), and running and maintenance costs for the AFBI estate.

2.3 AFBI's figures highlight that the amount and proportion of spend on 'corporate costs' is significant. This totalled £95.8 million (37% of total spend) between 2006-07 and 2010-11, with particularly high overheads related to AFBI's estate (combined costs of £51.2 million for the lease of land / buildings from DARD, rates / water, fuel and repairs and maintenance). In addition, £6.8 million was spent on maintaining library facilities at AFBI, and supporting attendance at training courses and conferences.

2.4 We accept that investment in training and library facilities is essential for a knowledge-based scientific body. We also acknowledge that AFBI's estate is specialist in nature⁵ which partly explains the high level of costs in this area. However, a property asset strategy completed by AFBI in April 2010 acknowledged that the Institute's main site at Newforge was already past its expected life-span; wasteful of space; carbon and energy inefficient; and that refurbishment would be costly, if not impossible. Preliminary estimates within this strategy indicated that re-locating Newforge to a smaller new building could yield total annual savings of £1 million. However, these costings did not take account of the capital costs of any re-location. The strategy also concluded that AFBI's site at Stormont was similarly in poor condition, and in need of major enhancement and refurbishment.

2.5 In light of the strategy's findings, AFBI assessed the potential of re-locating

a number of its business functions, including those based at Newforge, to the Institute's Stormont premises. However, AFBI concluded in September 2012, that there was no scope for any such re-location.

2.6 AFBI is currently assessing the feasibility and economic viability of either re-furbishing the existing buildings at the Stormont site, or constructing a new build facility so that the specialist veterinary work currently undertaken there can be continued in the long term. DARD and AFBI also continue to assess options for the relocation of activities from the Newforge site.

2.7 Whilst AFBI has delivered £3 million of efficiency savings between 2006-07 and 2010-11, Corporate Costs still amounted to £20 million in 2010-11 (37% of total spend). We consider that there may be scope for further efficiency savings in this area.

Recommendation 1

In view of the high costs associated with both the Stormont and Newforge sites, it is important that DARD and AFBI continue, as a matter of priority, to seek economically viable solutions for the respective proposals for refurbishment and re-location.

AFBI did not re-calculate its overheads for the first five years of its existence

2.8 The Department of Finance and Personnel (DFP) requires commercial

5 The AFBI estate includes scientific laboratories, high containment facilities, clinical waste incineration facilities and renewable energy research facilities.

Part Two: Financial Management within AFBI

fees charged by Government bodies to reflect the full costs of work undertaken or services provided, and, where the market permits, for profit to be charged. AFBI is subject to this requirement.

2.9 To achieve full cost recovery, all overheads⁶ must be accurately absorbed into fees being charged. On AFBI's creation, it should have established the overheads specifically associated with the new organisation. However, AFBI did not carry out the necessary work at that time. Until April 2011, it used a historical general overhead rate, developed by the former Science Service. This was based on a fixed percentage of staff costs (56.9%). AFBI could not confirm the basis for this methodology, nor when it had been developed by the Science Service. However, evidence available suggests that it was in use since at least 2003.

2.10 The use of this calculation to set AFBI's fees was unsuitable as it took no account of the cost structure of its other predecessor organisation (ARINI) and, in any case, as an entirely new organisation, AFBI had different overheads to its two predecessors (e.g. differing composition and usage of buildings, equipment).

2.11 AFBI did not finalise an assessment of its own overhead costs until October 2010 (over four years after its establishment). This had significant consequences, as it resulted in a 93% increase in the overall overhead rate (56.9% to 110%) from April 2011. However, the impact of

this was reduced by a 12% fall in the staffing element of costs. Overall, AFBI's charging rate increased by 15% as a result of these changes. In our view, fees charged up to April 2011 fell short of full cost recovery. We estimate that AFBI may have lost as much as £3.5 million income between April 2006 and March 2011, due to its failure to establish a calculation which accurately reflected its own overheads. In our view, external commercial clients were under-charged, with DARD's grant-in-aid effectively subsidising this work. DARD told us that it did not agree with this view. Instead, DARD told us that any earlier revision of the overhead rate may have resulted in AFBI not generating all the commercial revenues it did since 2006-07, due to its competitiveness having been reduced. In such circumstances, DARD told us that it may have had to provide additional grant-in-aid to AFBI.

2.12 AFBI highlighted that the estimated under-charging represented 1.5% of the total grant-in-aid provided by DARD during this period. The Institute also told us that the £3 million efficiency savings and absorption of £7 million inflationary pressures achieved between 2006-07 and 2010-11 meant that DARD had not subsidised any commercial work, and that an increase of £7.3 million in non-DARD income in this period reduced the level of grant-in-aid required. However, the level of DARD funding could clearly have been reduced even further between 2006 and April 2011, if an overhead which better reflected AFBI's actual costs had been in place.

⁶ Overheads include costs attributable to items such as rent, heat, light, stationary, laboratory consumables and non-cash elements such as depreciation.

AFBI is unable to provide a complete or fully accurate breakdown of costs across its business activities

2.13 Whilst the figures from AFBI's internal systems show total expenditure of £258 million between 2006-07 and 2010-11, only £115 million (45%) of this has been allocated against its main operational activities. The remaining £143 million (55%) represent 'indirect costs', comprising 'other costs' (£47.5 million) and 'corporate costs' (£96 million). Within this, there are significant amounts which we would have expected to have been allocated across operational activities:

Corporate Costs (2006 - 2011)

- Short term / casual staff £3.7 million
- Lease of land / buildings £33.6 million
- Rates / water £5.2 million
- Electricity / oil / gas £9.6 million
- Repairs / maintenance £2.8 million

Other Costs (2006 - 2011)

- Estate management £1.0 million
- Divisional / branch management £11.9 million
- Paid absence £23.4 million

2.14 This non-allocation of indirect costs means that the analysis of spend produced by AFBI for its main operational activities is significantly understated. This is particularly the case for the scientific testing and R&D undertaken for DARD, which are AFBI's most significant work areas. Where feasible, we would have expected AFBI to have developed more sophisticated arrangements for apportioning corporate and other costs across operational activities, so that the full cost of delivering these is clearly identified. This is basic, but important management information, which should be routinely generated for review by key stakeholders, including AFBI's Board.

2.15 It is important that AFBI improves the quality of its management information and monitors and reports on spending by main area of activity. Currently, the limited information and ongoing monitoring in this respect means that AFBI is not sighted on the full costs of its operational activities. Although AFBI missed four different Business Plan targets between 2007-08 and 2009-10 related to developing a costing system, it told us that all the components of such a system were introduced in April 2011, and that this would enable costs of the different elements of the Institute's work to be fully and accurately identified.

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Further work is ongoing to ensure that AFBI's fees accurately reflect the cost of its differing activities

2.16 Fees charged should accurately reflect the overheads associated with the differing activities delivered by an organisation. This is particularly relevant to AFBI, given its diverse work. For example, overheads for work undertaken in laboratories are significantly greater than for offices, due to higher operating and depreciation costs. However AFBI's current overhead charge, which is levied to all customers is a single, generic rate, which does not differentiate between the costs of its differing activities.

2.17 AFBI told us that the use of a single overhead rate is not uncommon across the public sector, and we are aware that such a rate is also currently used in some other public sector research establishments in the UK. Furthermore, AFBI highlighted its ongoing work to develop a more sophisticated charging model which will enable it to apportion overheads with greater precision across its different business activities.

2.18 We accept that, in most parts of the public sector, a single overhead charge is appropriate because the nature of activities provided by many organisations is broadly similar. In the case of AFBI, however, there is a significant difference in the overheads absorbed by its differing activities, as illustrated by the two examples below:

- testing and R&D work undertaken by AFBI's Food Science and Chemical Surveillance Branches involves the use of expensive laboratory equipment including mass spectrometers⁷ costing between £0.25 and £0.5 million each. Consequently, this work should attract significant capital overheads; and
- conversely, work undertaken by AFBI's Economics Division is less resource intensive, and this should incur a significantly lower overhead rate, but does not.

2.19 The current single overhead charge does not reflect the true cost of individual AFBI activities. We consider that this creates a number of risks to value for money:

- there is little incentive to control overhead costs within individual AFBI Divisions, as these can be absorbed elsewhere;
- there is a risk of cross subsidisation;
- appropriate fees, based around full cost recovery and (where relevant) profit, may not be being charged in all individual cases; and
- management are not sighted on the true cost of the individual activities being undertaken, and the value for money being provided.

As paragraph 2.1 indicated, AFBI is currently developing more sophisticated arrangements for charging, and a

⁷ A mass spectrometer is an instrument which can measure the masses and relative concentrations of atoms and molecules.

'strategic cost model' was introduced in December 2012. This will assist AFBI in setting fees which more accurately reflect full cost recovery.

Recommendation 2

When the strategic cost model is embedded, and the full costs of the activities delivered by the Institute's different Divisions identified, AFBI should use this information as a baseline to assess the scope for setting revised efficiency targets. This is particularly important in respect of corporate and other costs, which have a considerable impact on the total cost of delivering AFBI's key front-line operational activities.

AFBI's fees are based on estimated staff time, and there is no assurance that these estimates are accurate

2.20 Aside from the grant-in-aid received from DARD, AFBI generates income from a range of sources⁸. In 2010-11, this totalled £16.6 million, some £3.8 million (23%) of which related to commercial contracts. For this work, fees are mainly agreed with clients 'up-front', on the basis of estimated staff time required to complete the work. AFBI told us that, in line with DFP guidance, the charges for some of these contracts are based on what it "feels the market can bear", and that the customer ultimately has the option of accepting or rejecting these. However, AFBI does not reconcile budgeted and actual costs, and to date has not analysed the variance between

estimated and actual staff time taken on commercial contracts. In the absence of variance analysis, we consider that there is a risk that inaccurate forecasting could result in significant under-charging.

2.21 Because of the lack of comparison between forecast and actual outcomes, there is no evidence of the degree to which actual costs incurred on this type of work have been in line with fees agreed at the outset. In NIAO's view, an enhanced regime of variance analysis is required to identify whether under-charging could be a significant issue, and whether steps need to be taken to improve the accuracy of cost estimation.

Recommendation 3

AFBI needs further assurance that its fees agreed up-front for commercial work closely reflect actual time and costs incurred. The Institute should track the variances between the estimates of staff time required for commercial work, and actual time taken. If significant differences are apparent, AFBI should review its procedures for forecasting, with a view to improving the accuracy of its fee-setting.

8 In 2010-11 AFBI generated income from EU-funded R&D; analytical and diagnostic work for other Government departments and agencies; commercial contracts; sale of produce and livestock; royalties; and the charter of its ship.

Part Three:
Performance Management within AFBI



Part Three: Performance Management within AFBI

AFBI reports its performance through a framework of Business Plan targets, which are approved by DARD and validated by Internal Audit

3.1 Since its establishment, AFBI has reported performance annually through a framework of Business Plan targets. These are designed to assist the Institute achieve its overarching strategic objectives over a three-year Corporate Plan period. For the most recent completed period (2008-2011), AFBI set five strategic objectives:

- to sustain and grow its business spectrum;
- to deliver high quality, cost effective scientific, economic and emergency response services to customers;
- to be the preferred partner or contractor in the delivery of local, national and international scientific services;
- to maintain the skills and resources to provide services, including emergency response, that meet the agreed requirements of customers; and
- to seek to continually improve the management of the business and deliver value for money.

3.2 DARD approves AFBI's Business Plan (BP) targets before they are formally adopted. In addition, AFBI's Internal Auditors have always reviewed and validated the performance reported against its

BP targets, through an examination of relevant supporting documentation, to verify that there is sufficient evidence to confirm the level of performance reported by AFBI. Both of these measures reflect good practice.

AFBI has reported achievement of almost 80 per cent of its Business Plan targets between 2008-09 and 2010-11, including a key target to increase non-DARD income

3.3 We reviewed AFBI's performance against its Business Plan targets for the period of its 2008-11 Corporate Plan, to assess the strength of overall performance, and the degree to which key targets have been achieved. As shown in **Figure 4** opposite, AFBI set 114 different targets over this three year period. It reported that it had fully achieved almost 80% of its targets, and partially achieved a further 10%.

3.4 Strategically, a key issue for AFBI has been the need to diversify its revenue sources and increase its amount of income. Between 2008-09 and 2011-12, it set an annual target for generating income from non-DARD sources. This is important, given that pressures on the Northern Ireland block grant mean that the level of DARD funding is likely to reduce in the near future. AFBI exceeded its target in this area each year between 2008 and 2012. Indeed, since its formation, AFBI has generated over £68 million income from non-DARD sources and, in annual terms, this has more than doubled, from £6.3 million in 2005-06 to £14.7 million in 2010-11

Figure 4: AFBI's performance against Business Plan targets 2008-09 to 2010-11

Year	Total number of Business Plan Targets	Number and % fully achieved	Number and % partially achieved	Number and % not achieved	Other
2008-09	51	43 (84%)	0 (0%)	8 (16%)	0 (0%)
2009-10	26	16 (62%)	7 (27%)	1 (4%)	2* (7%)
2010-11	37	31 (84%)	5 (13%)	1 (3%)	0 (0%)
Total	114	90 (79%)	12 (10%)	10 (9%)	2* (2%)

Source: NIAO, drawn from AFBI records

*In 2009-10, one of the 26 business targets was deferred⁹, and performance against another was unable to be validated¹⁰.

(see **Figure 5** below). In 2011-12, this has increased further, to £16.8 million. This is a welcome development.

3.5 The majority of income has been generated through commercially-focused scientific testing and R&D activities, but revenue has also been received from the sale of produce and livestock, and the charter of AFBI's ship. In recent years, performance has also been considerably assisted by high-value royalties from two patents which prevent disease in pigs

and salmon. The scientific discovery related to these patents was attributable to research undertaken by the Science Service between 1998 and 2002. The first patent was filed in 1999 (seven years before AFBI was established). AFBI continued to work with the licensee to achieve full commercialisation, and has subsequently received £14.5 million income between 2008-09 and 2011-12. Whilst research undertaken by AFBI has not to date generated any similar substantial royalty income, this

Figure 5: AFBI's performance against target for generating non-DARD income

Year	Target for non-DARD income £m	Total non-DARD income generated £m	Income from commercial scientific testing and R&D £m	Income from royalties £m	Other non-DARD income £m
2008-09	Over 8.5	11.94	8.34	2.38	1.22
2009-10	10.5	10.77	6.90	2.86	1.01
2010-11	11.6	14.72	8.26	4.06	2.40
2011-12	13.3	16.82	10.71	5.25	0.86

Source: AFBI

9 Target related to developing system to assist identification of skills and resources required for AFBI's response to possible emergencies was dropped due to a change in organisational priorities.

10 Target to achieve less than 8.5 days staff absence per annum per whole time equivalent by 31 March 2010 – Performance unable to be validated due to issues over the accessibility of data held on HR Connect.

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nonetheless highlights the commercial potential of this work.

AFBI's scientific testing has largely been delivered to the required quality and target times

3.6 As paragraph 1.9 noted, scientific testing is AFBI's main business activity. In 2010-11, AFBI carried out 2.29 million statutory tests, 1.96 million (86%) of which were for DARD. In annual volume terms, the most significant statutory tests carried out are:

- brucellosis (approximately 1.2 million samples¹¹);
- bovine TB (approximately 26,500 samples);
- TSE¹² (approximately 120,000 samples); and
- tests for sheep and goat health (approximately 15,000 samples).

3.7 AFBI has not yet reported performance in terms of the cost of this testing, but has measured whether it has been completed in accordance with accredited standards and within required turnaround times. Although business plan targets of this nature were established in 2008-09 and 2010-11, these were excluded from the 2009-10 Business Plan¹³

“due to an oversight”. DARD told us that it has also monitored the testing which AFBI undertakes on its behalf, to ensure that this is delivered in line with Departmental requirements. AFBI's performance reporting between 2008-11 shows that a high percentage of all the key high-volume scientific tests were delivered to the required time-scales (see **Appendix 1**).

3.8 EC legislation, which came into force in January 2006, contained a provision that a range of scientific tests related to animal feed, health and welfare and food which DARD is required to carry out, could only be undertaken by laboratories with ISO accreditation¹⁴. In recognition that no European laboratories had achieved this, the EU permitted a four-year transitional period (to January 2010) for laboratories to achieve the requisite standards. DARD told us that the Department for Environment, Food and Rural Affairs (DEFRA) subsequently extended this to March 2010.

3.9 By February 2011, AFBI had only achieved ISO accreditation for 50% of the tests covered by the EU legislation. This level of non-compliance was recorded in AFBI's Corporate Risk Register, given that any further significant delays in achieving accreditation may have led to DARD appointing an alternative service provider to carry out

11 Within each individual sample, AFBI may be required to carry out a variable number and range of tests.

12 TSE - Transmissible Spongiform Encephalopathy: this involves testing cattle for BSE and sheep for scrapie.

13 In 2009-10, AFBI's Internal Audit identified issues with the accuracy of outturn figures for scientific testing, and the lack of quality assurance of these. For example, whilst AFBI reported that Veterinary Service Division (VSD) had undertaken 2.12 million statutory tests, Internal Audit could only validate 1.92 million. Figures supplied to NIAO by AFBI indicate 1.79 million tests by VSD. Given these discrepancies, we would express concerns over the completeness and accuracy of 2009-10 performance data.

14 ISO 17025 is an internationally recognised standard applicable to all testing and calibration laboratories, that provides customers with a formal recognition of the competence, impartiality, performance and capability of a laboratory. ISO 9001 is a generic standard for quality management systems.

the testing. However, AFBI has made significant progress in this area, and by July 2011, when AFBI's testing for Brucella received ISO accreditation, approximately 99% of tests falling under the legislation were being conducted to the required EU standards.

Measurement and reporting of the cost of DARD-funded scientific testing has been limited, and could be further enhanced

3.10 Whilst AFBI has monitored its delivery of scientific testing to required time and standards, measuring cost and efficiency in this area is also important, given that an estimated £143 million was spent on this area between 2006-07 and 2010-11. Unit costs are a basic measure of efficiency and productivity, but there are difficulties in developing these for some categories of scientific testing undertaken by AFBI (such as Bovine TB), which involve a variable and often large number of complex tests being applied

to one sample. AFBI told us that, where appropriate, feasible and required by customers, it had calculated unit costs. In circumstances where this is problematic or considered unnecessary, AFBI told us that it has instead measured the overall cost of service provision. However, AFBI has not yet established any targets related to the cost of scientific testing.

3.11 AFBI provided us with all the unit costs it has calculated to date and for which records were available (see **Figure 6**). We were surprised that these were only for a small number of test categories and for a limited period. For example, there is no evidence that any unit costs were calculated for testing for brucellosis eradication, or for food microbiology testing between 2006-07 and 2010-11. AFBI told us that other unit costs may have been calculated, but records may not have been retained. The Institute also told us that the overall cost of service provision has been available since AFBI was established in April 2006

Figure 6: Scientific Testing undertaken by AFBI for DARD – Overall costs (2011-12) and unit costs per sample (2006-07 to 2011-12)

Category of testing	Number of samples (2011-12)	Annual cost of testing (2011-12) £ million	Unit Cost Per Sample					
			06-07	07-08	08-09	09-10	10-11	11-12
TSE Surveillance	97,873	0.68	16.73	10.03	9.43	9.68	8.56	6.91
Brucellosis Eradication	1,246,398	1.89	n/a*	n/a*	n/a*	n/a*	n/a*	1.52

* not available

Note: In addition to the unit costs shown in Figure 6, there is also evidence that some unit costs have been calculated for animal disease surveillance work undertaken by AFBI, which is partially funded by DARD.

Source: AFBI

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and that it had provided DARD with details of overall costs for the different test categories through its assigned work programme which was introduced in 2010-11. However, in our view, overall service provision costs, particularly where significant numbers of tests are undertaken, provide only a limited measurement of efficiency.

- 3.12 Given the significance of scientific testing in the context of its overall business operations, we would have expected AFBI to have calculated unit costs or the overall cost of service provision for all test categories annually, and to have retained all relevant records and documentation. However, our examination found that this has not always been the case.

Recommendation 4

As AFBI's primary customer, DARD needs to gain assurance that the testing undertaken on its behalf is being delivered efficiently. DARD should determine the key high-volume and high-cost test categories for which it requires annual unit cost information. Where feasible, AFBI must calculate and monitor unit costs for these tests. Adequate records in this area must always be retained. When reliable baselines are established, AFBI should assess the scope for setting efficiency targets for reducing testing costs.

- 3.13 The limited data available makes it difficult to measure overall whether AFBI's scientific testing operations have been delivered efficiently. Nonetheless, we noted the following:

- TSE testing (DARD funded) – unit costs reduced by 59% between 2006-07 and 2011-12 (from £16.73 to £6.91). This is largely attributable to consumable kits required for this testing having fallen significantly in price¹⁵, but it was not clear from our review whether this was due entirely to market competitiveness, or improved procurement practices. Excluding these kits, unit costs have still fallen by 13%, indicating improved operational efficiency; and
- testing for phytoplankton¹⁶ identification (carried out for the Food Standard Agency) - unit costs increased by 89.6% between 2006-07 and 2007-08, and by 2011-12, these had risen by a further 10.6%. AFBI told us that, from 2007-08 onwards, this testing has been conducted to ISO¹⁷ accreditation standards, and that costs had increased due to the need for more staff time and enhanced record keeping.

- 3.14 Benchmarking costs with other providers would provide further assurance to DARD over the efficiency of the testing

15 Bio-Rad kits are procured for AFBI by DARD. These kits cost £9.54 each in 2006-07, but were procured for £3.31 between 2007-08 and 2009-10 and for £2.20 in 2010-11.

16 Phytoplankton are microscopic marine plants. In circumstances where too many nutrients are available, phytoplankton may form harmful algal blooms which can produce toxic compounds and have harmful effects on marine life, birds and human beings.

17 ISO – International Organization for Standardization

service being procured from AFBI. This would also enable the Institute to assess its relative competitiveness, and the scope for improvement in this area. AFBI highlighted that, in 2011, the Foods Standards Agency in GB ran a public tender competition for national testing undertaken on its behalf to measure toxins in phytoplankton and shellfish, and that the Institute (in conjunction with the existing service providers) successfully won this contract. However, the annual cost of this testing is relatively small (under £100,000), and there has been very limited benchmarking of costs of the scientific testing undertaken for DARD. To date, AFBI has only informally compared costs of brucellosis testing. This analysis concluded that AFBI's costs were "reasonably comparable" with the EU average.

- 3.15 In our view, limited use of unit costs and benchmarking makes it difficult to understand how DARD could be fully assured that it is receiving best value for money in return for the very significant funding provided to AFBI for scientific testing. AFBI told us that there is no established benchmarking club in the agri-food field. The Institute also told us that benchmarking costs in this area is problematic, due to uncertainties as to whether testing and the methodology used to cost tests is being conducted on a 'like-for-like' basis, and difficulties in obtaining information from competitors which is likely to be viewed as 'commercial in confidence'.

Recommendation 5

Whilst there are difficulties with benchmarking costs of scientific testing, DARD currently has limited assurance on the efficiency with which this function is being delivered by AFBI. Where feasible, the Department should develop more formal arrangements for regular benchmarking of the costs of its key statutory high-volume and high-cost scientific tests with relevant comparator organisations.

- 3.16 In respect of R&D, AFBI's Business Plan targets have, to date, largely focused on the quality of the work undertaken. For example, the targets have been expressed in terms of "carrying out work on commissioned projects in accordance with accredited standards" and "maintaining ISO accreditation". We recognise that targets of this nature are essential, given the importance of delivering R&D work to high quality standards.
- 3.17 In 2010-11, AFBI also introduced a Business Plan target which requires the outcomes of quarterly and annual monitoring of progress against milestones and budgets on R&D projects to be reported to DARD. This is a positive development, given that Part 4 of this report suggests an urgent need for improved performance in this area, and that the previous findings from the Westminster Public Accounts Committee

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indicate that cost management and timeliness of delivery have been long-standing problems in this area. However, it is too early to assess whether these new processes are delivering improvements. We also consider that the target, whilst an important first step, could be further strengthened to require the overall R&D programme to be delivered within a defined percentage of cost and time budgets.

Recommendation 6

The DARD-funded R&D programme is an important component of AFBI's work and both the Institute and the Department need to be assured that it is being managed in line with milestones for cost and timeliness. As commissioning agent, DARD should therefore consider how targets in this area could be further developed to specifically require R&D work to be delivered within established budgets and time-scales.

There is scope to improve the performance measurement and target-setting regime

- 3.18 While recognising that AFBI has been successful in meeting the majority of its business targets, we consider that there is scope to improve the organisation's performance measurement and target-setting regime in a number of areas.
- 3.19 **Targets are predominantly activity-based and lack sufficient quantification** - In our view, targets best shape business direction and inform

management if they are output and/or outcome-focused; can be measured and quantified; and reported on this basis. We consider that around 80% of AFBI's 114 Business Plan targets in the 2008-11 period did not meet these criteria, and that the suite of targets was significantly influenced by largely weak performance measures. **Appendix 2** provides 10 examples of such targets, and two specific examples from 2008-09 are highlighted below:

- to publicise AFBI's EU recognition with a launch event; and
- to participate in five major championships (like the National Ploughing Championships and the Balmoral Show).

In our view, targets of this nature provide little insight into the strength of AFBI's performance in delivering its key strategic objectives and the tangible outputs being achieved by the Institute. Similar concerns were echoed by AFBI's Internal Audit who, in 2009-10, concluded "we would expect the business targets, in an organisation as diverse and complex as the Institute, to be set at a more strategic level, to be more commercially focused and to be more quantitative in nature".

- 3.20 **Some of AFBI's targets have been insufficiently challenging** - For example, we would regard targets such as "to maintain expenditure within resource limits and to agreed budgets" and "to produce unqualified accounts", which

were in place in both 2009-10 and 2010-11, to be a standard requirement across the public sector and normal to the successful financial management of any organisation, rather than challenging and stretching measures. AFBI told us it considered its target not to exceed its budget as being challenging, given that it currently generates 30% of its income from various non grant-in-aid sources, a significant percentage of which are demand led.

3.21 **There has been a considerable turnover of AFBI targets, but some key quantitative targets have been measured over time** – There has been a considerable degree of turnover in the suite of targets (51 in 2008-09, 26 in 2009-10 and 37 in 2010-11). However, we recognise that performance has been reported consistently in some key strategic areas, including increasing non-DARD income, efficiency savings, publication of scientific papers and reducing staff absenteeism.

3.22 AFBI told us that it had substantially revised its business planning and target setting processes for the 2011-12 to 2014-15 Corporate Plan period. The Institute considers that this Corporate Plan and the associated goals and impact indicators quite clearly demonstrate an increased strategic and commercial focus. AFBI also told us that that its Business Plans from 2011-12 have contained a range of quantitative targets related directly to the Institute's strategic goals and priorities. However,

having reviewed the 2011-12 Business Plan, we consider that there is still scope for the suite of targets to be further strengthened.

3.23 **Targets could better measure AFBI's contribution to DARD's strategic objectives** - As AFBI receives over 80% of its funding from DARD, we would expect a number of its targets to measure the Institute's contribution to the broad strategic objectives of the Department. In its 2006-11 Strategic Plan, DARD established a number of outcome-focused goals including to:

- improve performance in the market place;
- strengthen the social and economic infrastructure of rural areas;
- enhance animal, fish and plant health and welfare; and
- develop a more sustainable environment.

3.24 These goals were underpinned by key indicators of what success would look like if they were achieved, and included many quantifiable measures such as: increased value added; increased export demand; a more competitive industry; a greater proportion of farms with multiple sources of income; increased biodiversity; recovery of key marine species; and reduced levels of key animal, fish and plant diseases.

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- 3.25 The nature of AFBI's work is likely to contribute to DARD's strategic objective of reducing key animal, fish and plant diseases. However, aside from this, none of AFBI's Business Plan targets link directly to DARD's Strategic Plan goals. This issue was also highlighted as a weakness by AFBI's Internal Audit in 2010-11. The activity-based nature of AFBI's objectives means they are not suitable for linking directly to strategic objectives and as a result there is no clear alignment between AFBI's targets and its contribution to DARD's goals. AFBI's Corporate Plan does not contain any targets or performance measures which would bridge the gap between its Business Plan and DARD's Strategic Plan. Given the nature of the relationship between AFBI and DARD, whereby the Institute delivers what the Department specifies, we would have expected a set of strategic targets and/or performance measures which would more clearly link AFBI's business performance with its contribution to DARD's Strategic Plan. DARD told us that the review and approval of AFBI Business Plan targets by the Departmental Board aims to ensure that these align to DARD's priorities.

Recommendation 7

Currently, there is no clear correlation between AFBI's Business Plan targets and their contribution to those of the parent department. Within its framework of business targets, AFBI should develop more strategic measures which demonstrate how its activities contribute to DARD's key strategic objectives.



Part Four: AFBI's Planning and Management of Research and Development Projects



Part Four:

AFBI's Planning and Management of Research and Development Projects

In January 2011, DARD introduced improved procedures for commissioning and managing R&D work delivered by AFBI

4.1 Since being established in April 2006, a key aspect of AFBI's work for DARD has been to deliver a programme of research and development (R&D) work. This work, which is intended to align with the Department's main strategic goals, was previously undertaken by its Science Service.

4.2 We reviewed AFBI's delivery of the DARD-funded R&D programme, focusing particularly on the appraisal of R&D projects, the extent to which projects have been delivered to cost and time budgets and the measurement of outcomes achieved. These were all areas which were reported on by the Westminster PAC in its May 1995 report on the R&D work which DARD's Science Service was at that time responsible for.

4.3 It is important to note that DARD has introduced a range of enhanced procedures in recent years around the commissioning, appraisal, monitoring and management of the R&D projects it procures from AFBI. These are summarised in **Figure 7**. The new arrangements clearly have the potential to improve the efficiency and effectiveness of the R&D programme, but as the typical life of an R&D project can span 4-5 years, it will be 2015 at the earliest before the full impact of these measures can be meaningfully assessed. DARD told us that the new measures have introduced much greater

transparency to the customer-contractor relationship, and ensure that R&D delivered by AFBI is unambiguously in support of the Department's strategic objectives.

Increased project costs mean that a third of DARD-funded R&D projects commissioned before 2011-12 were not subjected to full economic appraisal

4.4 Economic appraisal can help demonstrate value for money and satisfy public accountability requirements. The Department of Finance and Personnel (DFP) requires a proportionate appraisal process to be applied to all proposals for spending public money. In the case of AFBI, all DARD-funded R&D projects are covered by this requirement. DARD told us that it has subjected all projects to economic appraisal. On the basis of DFP guidance, projects with estimated costs above certain thresholds (£150,000 until 2008, £250,000 between 2009 until late 2010, and £500,000 thereafter) were subject to full economic appraisal. Projects with estimated costs below these levels were deemed by DARD as 'small projects', and the Department told us that it carried out a 'pro-forma' appraisal for these¹⁸. In line with DFP guidance, DARD told us that proportionate effort was applied to both full and 'pro-forma' appraisals.

4.5 We examined a total of 125 R&D projects, 45 of which were completed (between March 2007 and May 2011) and 80 which were still ongoing.

18 Whilst pro-forma appraisals are less detailed than full appraisals, DARD told us that the same economic appraisal principles were applied to these.

Figure 7: Revised arrangements introduced by DARD for commissioning and managing R&D work delivered by AFBI

Commissioning of R&D

In 2009, DARD published its Evidence and Innovation Strategy (EIS), a key principle of which was to ensure that the R&D work commissioned from AFBI was sufficiently policy-led. The EIS sets out a general framework for the DARD-funded R&D programme, and is underpinned by four Programme Management Boards (PMBs) and an overarching Evidence and Innovation Priorities Group established to review, identify and prioritise the Department's requirements and investment in R&D. The foundation of the EIS is built around DARD's strategic goals:

- to improve performance in the marketplace;
- to strengthen the social and economic infrastructure of rural areas;
- to enhance animal health and welfare, fish and plant health; and
- to develop a more sustainable environment.

Whilst the PMBs assess and prioritise all new proposed R&D projects, an overarching committee within DARD is ultimately responsible for approving the annual R&D work programme.

Appraisal

In 2011-12, DARD introduced enhanced measures for appraising individual R&D projects. Most significantly, AFBI must now compile a detailed proposal document and an economic appraisal template for all new R&D projects. These are passed to DARD for review, to ensure that the proposed work addresses its strategic objectives and to finalise and take ownership of the final economic appraisal.

Project management

In 2011-12, DARD introduced enhanced quarterly and annual monitoring of R&D projects against established budgets and milestones.

Post project reviews

DARD assumed responsibility for post project reporting on the R&D programme for projects commissioned under the new EIS arrangements from 2011-12.

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We found that around a fifth of these R&D projects were subject to full economic appraisal. However, in almost a third of projects we reviewed, actual costs exceeded the relevant cost thresholds for a full economic appraisal (FEA). AFBI did not undertake full appraisals for these projects, because the initial estimates fell below the thresholds, and, instead, the less detailed 'pro-forma' appraisals were carried out for these. In total, therefore, a further 39 R&D projects (14 completed and 25 ongoing) which should have been subject to FEA were subject to the pro-forma approach (see **Figure 8**). AFBI highlighted that the 14 completed projects had commenced prior to its establishment in April 2006. However,

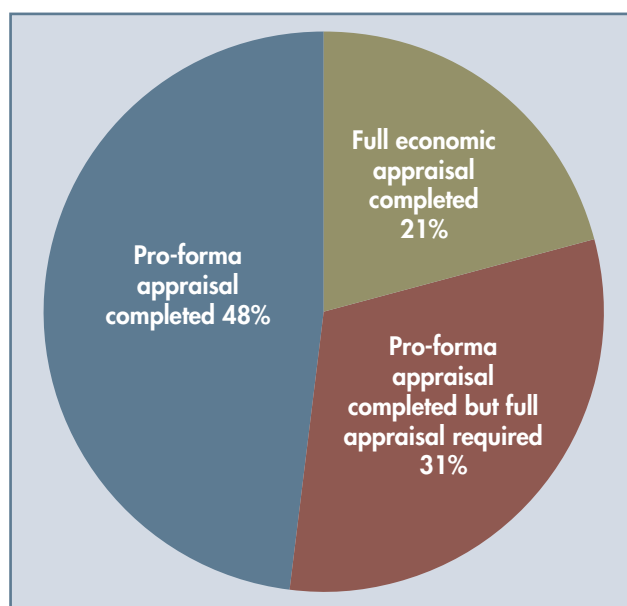
these were under the Institute's control for some period of time before being completed.

4.6

Of the 25 ongoing R&D projects not fully appraised by AFBI, but in which actual costs exceeded the FEA threshold, estimates for 7 (28%) were within 3% of the threshold. Examples include:

- a project estimated to cost £149,600 (just £400 below the threshold), but which, at May 2011, had cost £281,000; and
- a further three current projects with estimated costs of only £2,000 (1.3%) below the appraisal threshold, but for which costs had exceeded this by between 23% and 50%.

Figure 8: The 125 DARD-funded R&D projects examined by NIAO - Analysis of appraisals conducted



Source: NIAO, based on AFBI records

AFBI told us that the cost increases may have been attributable to the scope and duration of projects having been extended after they commenced, and that there was no evidence that the initial estimates for these projects had been deliberately understated to avoid the need for a full economic appraisal. AFBI also told us that as the same principals were applied to both pro-forma and full appraisals, it is unlikely that a different outcome would have been reached. Given that there was no contingency or provision for optimism bias built into the cost estimates, we consider that it would have been prudent for projects which were so close to the threshold to

have been subject to a full appraisal. However, DARD disagreed with this conclusion.

- 4.7 DARD's delegated limits do not contain a specific threshold which requires the Department to obtain DFP approval for resource expenditure (generally the main element of spend on R&D projects). DARD told us that it considered expenditure of more than £1 million in this area sufficiently large to warrant DFP scrutiny, and that it therefore established a policy for referring such projects to DFP, to ascertain if approval was required. However, in the period covered by our review, DARD acknowledged that there was no evidence that it had sought DFP comment or approval for two such R&D projects with estimated costs in excess of £1 million.

Recommendation 8

In cases where estimated costs are close to the threshold for a full economic appraisal, DARD and AFBI should consider whether it would be prudent to carry out a full appraisal. Furthermore, when variations in cost or scope occur, appraisals should be updated or an addendum added, depending on the significance of the variation, and, where variations exceed 10%, on advice received from DFP.

Around two-thirds of DARD-funded R&D projects were extended by AFBI and experienced significant cost overruns

- 4.8 The establishment of robust and formal budgets at the planning stage is a basic requirement of good project management, and this enables the strength of subsequent outcomes to be meaningfully assessed on an ongoing basis. We are therefore surprised that AFBI told us that the R&D projects we examined did not have budgets "as such", but instead had "cost estimates".
- 4.9 It is also important to note that when our fieldwork commenced, we saw no evidence that AFBI had been routinely generating information on the costs incurred to date for individual R&D projects. Instead, the Institute had to specifically generate this information for NIAO. In view of this, we are unclear as to how meaningful and ongoing project management could have been exercised over the projects which we reviewed. Although AFBI operated an annual review process to determine whether ongoing projects should continue, we found no evidence that this included any assessment of project costs, until 2010-11 when DARD's enhanced project management arrangements were introduced.
- 4.10 The information generated by AFBI included 'budgeted costs' (or cost estimates) for the 45 R&D projects completed for DARD since 2007. These

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Figure 9: Summary of actual and estimated costs for 45 completed R&D projects funded solely by DARD (2007 – 2011)

	Number of Projects	Total Estimated Cost (£m)	Actual Cost (£m)	Variance (£m)	Variance (%)
Completed over cost estimate	29	4.19	9.85	+5.66	+135%
Completed to cost estimate	2	0.19	0.19		
Completed under cost estimate	14	1.80	1.15	-0.65	-36%
Overall	45	6.18	11.19	+5.01	+81%

Source: NIAO, based on AFBI records provided in the course of our audit

estimates formed the basis on which projects were formally approved for commencement. We compared the final costs of these projects to the cost estimates. As **Figure 9** shows, total expenditure for these projects (£11.19 million) was 81% higher than the £6.18 million estimated.

4.11 Although 16 of these projects were completed on or below budget, 29 (64%) exceeded the initial "cost estimates" by more than 10%. Specific analysis of these revealed that:

- individual variances ranged between 17% (actual project cost £64,402 compared to an estimated £55,100) and 1,237% (actual project cost £381,706 compared to the £28,551 estimate). For the latter project, updated figures provided by AFBI (see paragraph 4.12) indicate a cost overrun of 819%;

- average project costs were £339,000 compared to the estimated £145,000 (i.e. a 134% increase); and
- the highest individual overspend (£883,895) involved £1.05 million spend on a project estimated to cost £171,630 (i.e. a 515% overspend). AFBI's updated figures suggest a cost overrun of £805,000 for this project.

4.12 After our audit had been completed, AFBI told us that the cost estimate figures for these projects did not include staff overheads, and that expenditure figures for a number of the projects also did not include these costs. When these are included, AFBI estimates that the total cost of completed projects was £14.74 million, compared to a revised estimate figure of £9 million. This would represent

Figure 10: Summary of actual and estimated costs for 45 completed R&D projects funded solely by DARD (2007 – 2011) – figures supplied by DARD after completion of audit

	Number of Projects	Total Estimated Cost (£m)	Actual Cost (£m)	Variance (£m)	Variance (%)
Completed over cost estimate	31	6.38	13.00	+6.62	+104%
Completed under cost estimate	14	2.62	1.74	-0.88	-34%
Overall	45	9.00	14.74	+5.74	+64%

Source: NIAO, based on AFBI records provided following the completion of our audit

a £5.74 million (64%) cost overrun (see **Figure 10**).

- 4.13 AFBI told us that from 2011-12 the cost estimates for the DARD R&D projects fully reflected all costs, including staff overheads. This is important, given that these figures are used to determine the level of economic appraisal which projects are subjected to. Prior to 2011-12, the appraisals undertaken were based around figures which did not represent the full economic costs associated with the projects.
- 4.14 Our examination of the 80 ongoing DARD-funded projects identified 49 (60%) which, at May 2011, had exceeded cost estimates by over 10%. Whilst the average budgeted cost of these projects was £156,000, actual average outturn at May 2011 was £392,000 (i.e. a 151% increase). Total spend on these projects was £19.21 million compared with the £7.64 million

estimated, meaning that costs had overrun by £11.57 million. In total, the costs for the 125 projects examined exceeded initial cost estimates by £12.7 million. Despite the cost overruns on these individual projects, AFBI told us that it has never exceeded its overall grant-in-aid budget, an element of which has always been allocated to R&D. In our view, this is largely irrelevant to any assessment of the value for money which has been delivered from AFBI's DARD-funded R&D programme and the quality of project management applied. Furthermore, DARD, in providing block grant-in-aid funding to AFBI, was unaware of the extent to which the cost of so many individual R&D projects had exceeded estimates.

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The majority of R&D projects have not been completed within original target duration times

4.15 Prior to 2011-12, AFBI did not routinely record specific start and end dates for projects. Instead, it recorded the year in which they were forecast to begin and be completed. This made it difficult to quantify precisely both the expected duration of projects, and the extent to which DARD-funded projects had been delivered within set time-scales. However the available records suggest that:

- for the 45 completed projects, their average duration was 5.4 years compared with an original estimate of between 2.2 and 3.2 years (i.e. somewhere between 70% and 140% longer than estimated); and
- for the 80 live projects, the average actual duration at May 2011 was 4.5 years, compared with the initial estimate of between 2.5 and 3.6 years. Only six of these were still within the projected time-scale.

4.16 AFBI attributed the fact that project costs had exceeded original "estimates", and projects had not been completed within target duration times to the scope of projects being extended as a result of an annual review process within the Institute. It also told us that projects were often extended after research work had ceased, in order to facilitate the "writing up" process which leads

to the publication of scientific findings. However, in our view, had best project management practice been followed, an appropriate allowance for the "writing up" process would have been included within the initial time budget for these projects.

4.17 To date, AFBI has not routinely identified costs specifically associated with the "writing up" process. Whilst it produced estimates for a sample of projects, we identified significant doubts over their accuracy. For example, some estimates suggested that the "writing up" process had only cost £49 and £683 for projects with total expenditure of £540,000 and £470,000 (i.e. less than 0.2 % of total costs in both instances). By contrast, other estimates indicated that "writing up" costs for another project with total costs of £380,000 were £75,000 (25% of total expenditure). As part of a robust project management environment, we would have expected these costs to have been specifically and accurately monitored and reported on.

4.18 In 2010-11, DARD introduced an enhanced performance monitoring framework for all newly commissioned R&D projects. This includes quarterly and annual review of spend against budgets, and tracking of progress against key milestones.

Recommendation 9

It is important that the new performance management framework delivers improved outcomes in practice. DARD and AFBI must take steps to ensure more accurate forecasting of the likely costs of R&D projects at the planning and approval stage so that they are subject to the appropriate level of economic appraisal, and to provide a robust basis for measuring cost outcomes. DARD should also assure itself that the new framework is functioning effectively and being sustained over time by undertaking a bi-annual review of compliance with the new arrangements.

The substantive benefits from an ongoing R&D project which commenced in 1957 are unclear

- 4.19 In addition to general concerns over Science Service's failure to ensure timely completion of R&D projects, PAC's 1995 report also highlighted particular issues around a long-running potato breeding project, which had commenced in 1957:

"We are concerned that there has been a lack of significant market success from a potato breeding programme which has been running for over 35 years. We urge the Department to put in place robust controls to prevent long-term research projects continuing indefinitely where they are not delivering results".

Eighteen years later, and 56 years after it commenced, this project remains ongoing. **Appendix 3** provides

fuller details of the project costs and outcomes.

- 4.20 Following the 1995 PAC report, we saw evidence of a limited annual review of this project by Science Service, and more recently AFBI, which mainly highlighted the importance of developing new seed potato varieties and improving sales to Europe. It was not until September 2004 (nine years after the PAC report) that DARD commissioned consultants to assess the ongoing viability of this project in detail.
- 4.21 The consultants' report (August 2005) identified key recommendations to assist future delivery of the programme, centred around the need for an increased commercial focus, improved marketing, and a reduction in DARD's future commitment and funding. A specific recommendation was that DARD should continue to support an element of potato breeding, but that its financial contribution should reduce progressively over the following five years. If by the end of 2010 the programme was not generating at least 45% of its own costs, the consultants considered that DARD should review its performance and future.
- 4.22 In response, DARD sought to re-organise the programme into separate 'strategic' and 'commercial' elements to be delivered by AFBI and the private sector respectively. However, the Department experienced considerable delays and difficulties in appointing a viable commercial consortium to deliver the 'commercial' element and in establishing

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the associated contractual arrangements. Consequently, re-organisation of the programme was delayed until September 2010.

4.23 This meant that it was not feasible to achieve the consultants' original recommendation that the ongoing viability of the programme be reviewed by the end of 2010. Consequently, DARD continued to fund full programme costs until September 2012. More positively, DARD told us that the target for a 20% cost reduction was achieved in 2011-12 (the first full year of the new programme arrangements). DARD told us that it reviewed the viability of the programme in March 2012, and concluded that it should continue on the basis that it represented a key strategic priority, but that it will assess the programme again in 2013-14.

4.24 Available documentation indicates expenditure of at least £7.2 million on the programme since 1982, but a lack of records means total costs are unknown. In providing evidence to PAC in 1995, the Department told the Committee that the development of a good potato breed could present very good opportunities in Mediterranean countries, and that there was an expectation that two varieties "would be quite successful in the near future". Despite this, the level of Northern Ireland seed potato production has declined markedly from 55,400 tonnes in 1994 to 20,200 tonnes in 2010, and the lack of significant market success highlighted by PAC in 1995 has clearly not yet

been addressed. DARD told us that the consultants' review had identified several external commercial factors as being responsible for the difficulties facing the seed potato industry. DARD also told us that whilst the objective of the AFBI breeding programme has always been to produce new varieties, the local industry had failed to co-ordinate in efforts to secure industry-wide access to these varieties, and had instead focused on the use of outdated potato varieties.

4.25 DARD and AFBI have indicated to the local seed potato industry that the recent re-organisation of the programme represents a "last best chance for them". In this respect, DARD and AFBI have inserted a clause into the contract for the re-organised programme which, if necessary, enables both parties to cease participation and funding in March 2017. DARD pointed out that a private sector consortium had seen sufficient worth in the programme to invest in it. DARD also highlighted that the longevity of this project is not unique in the context of the wider public sector.

Until 2010-11, AFBI's annual review of ongoing R&D projects considered benefits, but not cost increases

4.26 Until 2010-11, all ongoing DARD-funded R&D projects were subject to an annual internal assessment by AFBI. Approval was required from senior management for continuing the research, either within the originally approved parameters (with an extension to the

approved project duration), or through changing the scope of the work being undertaken.

- 4.27 AFBI told us that the cost increases in its R&D projects were mainly the result of the scope of projects being extended through this annual review process. AFBI also told us that the final decision on whether a project should be extended rested with AFBI's Chief Executive, who would only approve this course of action if there was evidence that "additional benefits" were "likely" to emerge from the research. DARD acknowledges that it had no input into this annual review process, and that this was driven exclusively by AFBI. In our view, it was inappropriate within the contractor-client relationship for AFBI to have had the final authority in approving extensions to work being funded by DARD.
- 4.28 In addition, we do not consider the review process to have been a sufficiently robust assessment of ongoing value for money or viability, as there was no evidence that it took account of costs incurred to date, or likely future costs. The annual review instead solely assessed the significance of research findings to date, and the potential for future scientific benefits. We recognise that a simple cost-benefit analysis by itself does not provide a complete picture of the performance of an R&D project. Nonetheless, as part of robust annual monitoring, we would have expected a clearer and more rounded assessment of costs incurred to date and likely final cost of bringing the work to completion,
- together with a clearer elaboration of benefits secured and future potential outcomes.
- 4.29 The following case study (a DARD-funded R&D project) demonstrates the impact of the uncertainty around costs and benefits, and how the estimated benefit to cost ratio can be significantly affected by rising costs as a project progresses. In this example, costs were over six times their initial projection by the time the project was terminated in 2011, but, as yet, no additional quantitative benefits have been identified. AFBI told us that benefits to the agri-food industry will only be identified when a Post Project Evaluation (PPE) is undertaken, but highlighted that the research findings had been published in five scientific journals, and presented at a scientific conference.
- 4.30 In strict cost-benefit terms, the evidence to date shows the value for money from the project to be disappointing. However, DARD highlighted that investment in research is a classic area of market failure with a low predictability of delivering a cost-benefit ratio, and that even research which proves a technology to be ineffective can be highly valuable. DARD also told us that much of its commissioned research is aimed at providing policy evidence and, in such instances, a positive cost-benefit financial outcome is meaningless. Whilst DARD intends to carry out PPEs for all R&D projects undertaken for it by AFBI, sufficient time has not yet elapsed in most cases to measure benefits which may

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have arisen from the research, and the overall performance achieved from the research programme is therefore unclear. This also means that it is not yet possible to assess the degree to which PAC's conclusion from 1995, that there should be proper targeting of resources on projects most likely to deliver worthwhile results, has been met.

Case Study – AFBI R&D project on the application of novel processing technologies for the preservation of foods

- This project, related to novel ways of killing bacteria in fruit and vegetables, was originally estimated to cost £141,000 in 2003 (although work did not commence until 2006, an updated cost estimate was not prepared).
- Scheduled for completion in 2008, the project ran until 2011, when it was terminated. AFBI told us that it is not unreasonable for research of this nature to continue for several years. In 2003, the project was estimated to have a marginal benefit to cost ratio of 1.02:1, based around £143,820 of anticipated benefits against a cost of £141,000. However, from 2006, approval was granted annually to continue the project, and whilst no additional benefits have yet been identified, current costs stand at £906,221. This represents a revised negative benefit to cost ratio of 0.16:1.

- As a PPE for this project has not yet been completed, the final benefits of this research cannot be determined, nor can a final cost to benefit ratio be calculated. However, DARD told us that industry partners are currently trialling the technology, and that it is attracting international interest.

Recommendation 10

It is important that DARD retains documentation to show that any decision under the Department's Evidence and Innovation Strategy to extend an R&D project is supported by a full and rigorous consideration of additional costs, and the likely contribution of the project extension to the strategy. This improved level of control must be sustained in the longer term.

- 4.31 AFBI told us that the nature of its R&D work makes it very difficult to forecast at the outset the final cost and time of completion. For example, AFBI emphasised that it is only when projects commence and initial findings emerge, that the true scope of research required to deliver maximum benefits becomes apparent. In our view, this reinforces the need to put in place robust and effective arrangements for assessing the ongoing viability of individual R&D projects. The enhanced project monitoring processes introduced in late 2010 for the DARD-funded R&D programme (see **Figure 7**) is a welcome development in this regard. However, these will need to operate

effectively in practice, and be sustained over time, to have the maximum impact.

To date, only a limited number of DARD-funded R&D projects have been subject to post project evaluations

- 4.32 DFP requires completed projects to be subject to a proportionate PPE process, in order to:
- evaluate the extent to which objectives have been achieved;
 - compare estimated and actual outturns; and
 - identify what lessons can be learned and disseminated, thereby assisting the planning and management of future projects.
- 4.33 Until 2011-12, responsibility for PPEs for DARD-funded R&D projects lay with AFBI. At May 2011, no PPEs had been carried out for these projects, but AFBI had identified 32 which it intended to subject to this process. AFBI told us that it had not commenced any PPEs because insufficient time had elapsed for research findings to translate into the agri-food environment, and for all benefits to have been realised. Whilst the due date (2010) for PPEs had passed for 3 of the 32 projects, AFBI told us that these had been deferred, as benefits emerging from the research had not been fully realised.
- 4.34 From 2011-12, DARD assumed lead responsibility for PPE reporting on the R&D projects commissioned under the new EIS arrangements. Responsibility for PPEs for projects which pre-date this remains with AFBI. To date, PPEs have been completed for 19 of the 45 pre-EIS projects commenced between March 2007 and May 2011. AFBI told us that reviews will be completed for the remaining 26 at an appropriate time post completion.
- 4.35 It is positive that the PPE process for completed projects has commenced. DARD also plans to undertake PPEs for all 92 projects which are currently ongoing, and within this process, expected and actual project costs and deliverables will be analysed, and the reasons for any variance between these identified. The degree to which desired scientific objectives have been achieved will also be assessed.
- 4.36 The programme of PPE review is particularly important, given that the significant cost and time overruns which were experienced on many of the pre-EIS projects mean that there are almost certainly significant lessons to be learned for future application. This should also help AFBI and DARD assess value for money achieved from an area in which the Department invested over £60 million between 2006-07 and 2010-11.

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Recommendation 11

To ensure adequate post-completion assessment, PPEs should be undertaken for all individual R&D projects, suitably commensurate with project scale. These should be supplemented by a periodic portfolio value for money evaluation of the overall DARD-funded R&D programme, possibly every five years.

Peer review of AFBI's R&D projects is positive, but more needs to be done to quantify actual benefits delivered to the agri-food sector

- 4.37 AFBI has placed significant reliance on the peer review process via publication of its research in scientific journals, as well as disseminating its research findings to scientific conferences, to demonstrate the value of its R&D work. This enhances AFBI's reputation in the scientific arena, and provides opportunities for developing partnerships, thereby creating potential for increasing future commercial research income.
- 4.38 Since its establishment, AFBI has published 836 articles in peer-reviewed scientific journals. AFBI has also participated in almost 1,900 knowledge and technology transfer events aimed at encouraging the agri-food industry to adopt new approaches and techniques identified by its research. Whilst publication is one indicator of the success of completed projects, this alone provides limited quantitative measurement of the direct financial benefits being delivered to the agri-food industry from DARD's significant investment in the Institute's R&D programme. A more timely and comprehensive programme of PPEs (see Recommendation 11) is likely to be of assistance in this regard.
- 4.39 AFBI told us that direct financial benefits alone are a limited basis for assessing the impact of the DARD-funded R&D programme. The Institute highlighted that, as the R&D commissioned by DARD is primarily to support the Department's Evidence and Innovation Strategy (EIS), a key aspect of judging success and impact is the extent to which the work assists and influences policy development.
- 4.40 AFBI provided NIAO with a wide range of examples of successful outcomes which had been achieved from its research¹⁹. These primarily focused on knowledge and technology transfer benefits delivered to the agri-food industry, and the contribution of the Institute's research to policy development. However, AFBI also highlighted examples of direct financial benefits achieved. **Appendix 4** contains four illustrative case studies which highlight benefits which have emerged from AFBI's R&D work. These are summarised in **Figure 11**.
- 4.41 Whilst a range of factors clearly need to be taken into account when assessing the effectiveness of the DARD-funded

Figure 11: Examples of benefits delivered by AFBI from the DARD-funded R&D programme

Research	Outcomes Achieved
Socio-Economic Policy Analysis Programme	Over the last 15 years, economic analysis from this programme has been used to support the UK's position regionally, nationally and internationally, including at Common Agricultural Policy (CAP) and World Trade Organization (WTO) negotiations. AFBI told us that this research was instrumental in securing benefits of £15.5 million achieved in the first full year of implementation of CAP. By comparison, the annual cost of this research is £196,000.
Nitrates Action Programme	This research has resulted in grain traders in Northern Ireland agreeing to lower phosphate levels in livestock feed. Consequently, important environmental benefits are anticipated, including a reduction in eutrophication ²⁰ levels in freshwater lakes in Northern Ireland. Whilst a PPE for the project stated that calculating outcomes was "an extremely complex issue", it concluded that benefits of £5.98 million over a six-year period would be realised compared with total costs of this research of £0.7 million.
Plant Genetic Improvement Research	This research involves plant breeding and variety testing to enable farmers to use the latest and most productive varieties. For cereal production, an increase of 0.1 tonnes per hectare is accepted by the scientific community as a "reasonable estimate" of benefits delivered through introducing new varieties. Consequently, AFBI estimates that its research has generated an additional £0.68 million annually in the value of grain produced in NI (suggesting a benefit / cost ratio of 2.1:1). AFBI also undertakes a grass breeding programme, and in 2007, consultants concluded that this had delivered an annual increase in profit margin for the sector of £0.92 million (a benefit / cost ratio of 2.7:1). AFBI told us that additional unquantified spill-over benefits from outside Northern Ireland have also been achieved.
Vaccines to prevent disease in pigs and salmon	This research was conducted by Science Service between 1998 and 2002, and resulted in the development of vaccines to prevent disease in pigs and salmon. A commercial patent related to the discovery was first filed in 1999 (seven years before AFBI's establishment). AFBI continued to work with the licensee to achieve full commercialisation, and has subsequently received £9.3 million in royalty income between 2008-09 and 2010-11.

20 Eutrophication is the ecosystem response to the addition of artificial or natural substances, such as nitrates and phosphates, through fertilisers or sewage, to an aquatic system.

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R&D programme, we consider a key measurement of value for money to be the extent to which financial benefits achieved outweigh the cost of the research. This is best illustrated where outcomes have been independently validated. AFBI told us that this represents a very narrow view of the effectiveness of this research, and that adopting this as a prime measurement would drive the research agenda towards low risk, near market type R&D, and also result in the neglect of research to inform policy. However, in 1995, PAC concluded that resources on the research programme needed to be properly targeted on projects most likely to deliver worthwhile results.

4.42 The case studies above suggest that AFBI R&D projects have been delivering net financial benefits. However, as AFBI's Nitrates Action Programme highlighted, it is sometimes only possible to make estimates of the outcomes achieved from R&D work. AFBI's Plant Genetic research also illustrates the need for enhanced levels of PPE review to measure the degree to which anticipated benefits have actually materialised. Ultimately, a portfolio evaluation of the R&D programme (**see Recommendation 11**) may provide the most meaningful measurement of value for money in this area.

4.43 We also consider that shortcomings in AFBI's management information may present difficulties in evaluating outcomes. For example, whilst the Plant Genetic research programme

commenced before AFBI's establishment, the Institute could only provide us with costs for 2011-12, telling us that a disproportionate effort would be required to obtain the total cost of this research. In our view, this is basic management information which should be readily available.

DARD completed a review of ongoing R&D projects in 2012, which resulted in two-thirds of these being immediately terminated

4.44 In March 2012, DARD completed a comprehensive review of 79 ongoing projects which commenced prior to the introduction of its Evidence and Innovation Strategy (EIS). Of these 79 projects:

- 52 (66%) were immediately terminated;
- approval was given for 10 (12%) to continue, subject to production of an agreed forward work plan outlining remaining work, milestones and expected costs;
- approval was given to continue 6 (8%) during 2012-13 as strategic research, again subject to production of an agreed work plan; and
- a decision was deferred on the remaining 11 projects (14%), pending production of further information to enable DARD to reach a final decision on ongoing viability.

- 4.45 This is a welcome development. However, in our view, the review's outcome, which saw two-thirds of ongoing projects immediately terminated, casts doubt on the robustness of the previous annual review process, which had resulted in approval being given for many of these projects to continue over successive years. In such circumstances, we can only conclude that projects were allowed to continue over prolonged periods without achieving substantial benefits. DARD told us that the termination of these projects did not mean that they were no longer delivering, or were unlikely to deliver future benefits. DARD also emphasised that as the previous AFBI annual review process focused on the scientific merits of projects, and its overarching review had addressed policy priorities, the two processes were always likely to arrive at different conclusions. In DARD's view, the EIS has identified higher priority projects which better addressed its evolving priorities and policy requirements.
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Part Five:
Corporate Governance within AFBI and oversight
of the Institute by DARD



Part Five:

Corporate Governance within AFBI and oversight of the Institute by DARD

Costing of the work programme for AFBI was delayed

- 5.1 It is fundamental to any customer-contractor relationship that the customer sets out clearly from the outset both the outputs required and the price they are prepared to pay for these. AFBI's enabling legislation (the 2004 Agriculture Order) specified that the Institute and DARD "shall, for each financial year, agree a programme of the Institute's proposed activities in that year".
- 5.2 In early 2004, DARD established a Project Board to oversee the establishment of AFBI, and one of its aims was to "prepare a balanced work programme for the first year of operation". In this respect, the Department originally intended having a formal and fully costed work programme in place for AFBI's establishment in April 2006. This was not achieved, largely due to significant problems with generating the financial information required to cost the individual elements of the programme. These problems were attributable to the need to improve and merge the systems of AFBI's predecessors (Agricultural Research Institute of Northern Ireland (ARINI) and the Science Service). Consequently, AFBI's operations on its establishment were directed by the existing Science Service and ARINI work programmes.
- 5.3 DARD considered that the absence of an initial work programme in the short term posed "no significant governance risks". In February 2006, it established a strategy for ensuring that the financial systems required to support a fully costed work programme would be in place by March 2009 (i.e. three years after AFBI's establishment). As an interim measure to assist its oversight of the work being delivered for it by AFBI, the Department approved a "provisional high level" programme in July 2006, based largely on the existing Science Service and ARINI documents. However, without the necessary financial information, DARD was unsighted within this programme on the specific costs of the different activities being delivered for it by the Institute. The absence of information on how grant-in-aid from DARD was being spent by AFBI also meant that it was unclear whether DARD, as the customer, was overpaying for services, or if AFBI was over-providing these.
- 5.4 Ongoing problems with developing robust financial systems meant that an initial attempt to cost the work undertaken by AFBI for DARD was not produced until 2009-10. This enabled DARD and AFBI to develop a formal costed work programme, which was established in 2010-11, four years after AFBI's establishment. This outlined, for the first time, a detailed description of the work to be delivered by AFBI for DARD, and the cost of this.
- 5.5 The costed work programme has been fundamental in demonstrating to DARD how its grant-in-aid is being utilised, and helped inform the Department in negotiations with AFBI on determining

its grant-in-aid settlement within the 2012-15 Comprehensive Spending Review. It has also helped DARD review the work being delivered for it by AFBI and consider the cost implications of terminating lower priority work areas which had been previously identified. DARD forecasts that savings of approximately £1.8 million will be achieved between 2011 and 2015 from this initiative, in addition to £3 million savings which have been realised between 2006-07 and 2010-11 from a wider efficiency agenda. The identification of further potential savings is welcome, but also highlights the type of action which DARD was unable to take prior to the introduction of a costed work programme.

A formal Memorandum of Understanding between DARD and AFBI was not agreed until 2012

5.6 As well as a costed work programme, a Financial Memorandum and Management Statement (FMMS) between an ALB and sponsor body is a key element of a strong governance framework, as this sets out the accountability arrangements between the parties. Whilst a draft of the FMMS between AFBI and DARD was in place in April 2004, the final version had not been agreed when the Institute commenced operations in April 2006. It was formally approved by DFP in January 2007.

5.7 A Memorandum of Understanding (MoU) sets out the key principles upon which a customer-contractor relationship operates, and the respective responsibilities of both parties. Although not a mandatory requirement, it helps such a relationship to operate effectively. A draft MoU between DARD and AFBI was produced in March 2008, but the final document was only formally agreed by the Institute and DARD in June 2012. Prior to this (in March 2010), individual Service Level Agreements (SLAs) covering the different elements of work and services provided by AFBI for DARD were put in place. AFBI told us that these were part of the evolving process aimed at developing a strong customer-contractor relationship. However, it is evident that, for the first four years, there was no formal documented basis defining how the customer-contractor relationship between DARD and AFBI would operate.

DARD has established a framework for overseeing and monitoring AFBI's operations and performance

5.8 To manage the high level of operational and financial risk associated with a newly-created organisation, it was important for both AFBI's Board and DARD to exercise strong scrutiny over the Institute's operations from the outset. On AFBI's establishment, DARD set up a dedicated 'AFBI Sponsor Branch' (ASB) to exercise ongoing oversight. Furthermore, the Department has held formal and regular governance meetings with AFBI since May 2006.

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- 5.9 Developing and promoting governance best practice across the public sector has been an evolving process. In response to a 2007 PAC report²¹, DFP established an Arms Length Body Review Team to complete an NICS-wide review of sponsorship relationships operated by each Department for their ALBs. The DARD element of this review was completed in March 2010, and as for all Departments reviewed, resulted in a series of recommendations and an associated action plan being drawn up. A key element of DARD's action plan was the requirement to develop an ALB sponsorship manual, which was formally introduced in April 2012. The manual provides wide-ranging guidance on how DARD should exercise oversight of its ALBs, including the appointment of Board Members, Corporate and Annual business planning and financial planning and monitoring. Whilst regular governance meetings between DARD and AFBI had taken place since 2006, the manual also requires a specified approach for conducting these, including the use of an Assurance Statement pro-forma as the basis of the agenda.
- 5.10 In addition to the oversight of AFBI by ASB, DARD told us that there has always been monthly reporting of the Institute's financial performance to the Departmental Board. This was traditionally provided by DARD Finance Branch. However, in response to a request from the Board for supplementary analysis in this area, ASB has provided additional monthly briefings since April 2011.
- DARD and AFBI have introduced further recent improvements to governance, and continue to work together in this area**
- 5.11 Following the introduction of the costed work programme and the MoU, DARD and AFBI have continued to work together to further enhance governance within the Institute, with a particular emphasis on improving the quality of financial information. This was necessary, given that up to 2010-11, DARD considered that finance reports being provided by AFBI were still insufficient to meet the Department's requirements. In April 2011, AFBI's Board established a Finance sub-committee. This committee has been working to secure improvements to the quality of AFBI's financial information and reporting. For example, it has secured enhancements to monthly Finance and Budget Monitoring reports produced for DARD and the AFBI Board, as well as subsidiary analysis of expenditure on overheads and salaries and wages. This will assist both the AFBI Board and DARD to effectively discharge their governance role.
- 5.12 In December 2012, AFBI also introduced a 'strategic cost model'. This will provide more precise costings of the various activities which AFBI carries out for DARD. It will also enable AFBI to apportion strategic costs to its different operational activities with greater accuracy, compared with the generic overhead rate which has been used to date. AFBI has also introduced improved arrangements for measuring delivery

against targets and has put in place enhanced business planning procedures, which were necessary given that Internal Audit highlighted an absence of such procedures in 2010.

5.13 In 2010, AFBI's Internal Audit also highlighted that, as the Institute's Business Plan targets had not been formally costed, there was no assurance that its objectives could be delivered within its budget. The auditors viewed this as non-compliance with the Financial Memorandum and Management Statement, which requires targets to be linked to budgeting information so that DARD can readily identify resources needed to achieve specific objectives. DARD told us that, whilst AFBI's individual targets have not been costed, it is content that the Institute's Business Plan objectives and activities are deliverable within its budget, and that it had challenged AFBI where it did not consider this possible. DARD also told us that it conducts regular in-year monitoring to ensure that AFBI remains within its budget.

5.14 Despite the improvements introduced and those currently being implemented, work by AFBI's Internal Audit in 2011-12 suggests that key issues still need to be addressed. Whilst Internal Audit provided a 'satisfactory' level of overall assurance, specific areas of concern were also identified:

- issues relating to the timeliness, usefulness and accuracy of the management information being

provided to the AFBI Board, Finance sub-committee, Senior Management Team and the Institute's Divisions and Branches were unresolved;

- there remained a 'disconnect' between AFBI's Finance Department and the Institute's operational staff, particularly in relation to the awareness of senior management of the financial position of their Divisions and Branches; and
- AFBI had still not developed a fully documented suite of financial policies and procedures.

AFBI has introduced action plans and associated timetables to address these weaknesses. The Institute has also directed additional resources towards improving internal systems and processes, particularly in relation to financial reporting and income management.

5.15 In our view, the development of an improved corporate governance framework within AFBI has been a prolonged process, with a formal work programme and improved financial reporting and business planning only achieved five years after the Institute's establishment. Prior to this, it is unclear how DARD could have had full assurance that it was receiving value for money in return for the significant funding committed to AFBI.

5.16 The steps being taken to address the weaknesses recently identified in

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AFBI's management information should further strengthen governance within the Institute. We acknowledge that both DARD and the AFBI Board have exercised ongoing scrutiny of AFBI since it was established. However, we still consider it disappointing that improvements in key governance areas have not been delivered sooner.

- 5.17 Despite DARD's oversight, we consider that the Department was unaware of a number of important performance shortcomings highlighted by this report. Most significantly:
- because AFBI did not accurately revise its overhead rate until April 2011, fees charged for non-DARD work prior to this may not have achieved full cost recovery, with the Department at risk of subsidising this work;
 - unit costs for all categories of scientific tests conducted for DARD were not being routinely calculated; and
 - a substantial number of R&D projects had experienced significant cost and time overruns compared with original estimates. In over 30% of projects examined by NIAO, costs escalated above the level where DFP guidance required these to be re-appraised, but DARD was unaware of this. Furthermore, at least 70% of projects had not been completed within initial target dates.

Key weaknesses with Science Service's R&D programme highlighted by the Westminster PAC's 1995 report were still apparent until 2010-11

- 5.18 DARD had principal responsibility for overseeing the implementation of recommendations from PAC's 1995 report on the Science Service's R&D programme. In 1997, the Department's Internal Audit concluded that PAC recommendations relating to the control of long-term research projects, timeliness of project completion and targeting of applied research projects on areas likely to deliver greatest benefits had been fully implemented. Internal Audit found that further action was required to fully implement recommendations related to the introduction of a computerised costing system, but did not provide any indication on whether the recommendation that there should be greater use of formal project management techniques had been implemented.
- 5.19 We have seen no further evidence on whether the recommendations outstanding at 1997 were fully implemented, and whether the improvements introduced in a number of areas were sustained in the longer term. However, in our view, this examination indicates that similar issues to those raised by PAC in 1995 were also prevalent within AFBI until relatively recently:
- a full costing system was only introduced in April 2012;

- until April 2012, the costs of a significant number of R&D projects were increasing above the original cost estimates, and these projects were not being subject to the required level of appraisal or re-appraisal;
- formal quarterly and annual project management of newly commissioned R&D project costs and milestones was only introduced in 2010-11; and
- whilst the failure to set precise forecast dates for the start and end of projects makes it difficult to assess whether these were completed to schedule, available evidence shows that at least 70% of the 125 R&D projects examined by NIAO were not completed within initial target dates.

DARD's procedures for commissioning and managing the research and development it procures from AFBI were substantially strengthened in 2011-12

5.20 The programme of DARD-funded Research and Development (R&D) projects which is delivered by AFBI currently involves estimated annual spend of £8 million. It is therefore crucial for DARD to determine in advance the type of research that will make the most effective contribution to delivering its strategic objectives.

5.21 In 1996-97, DARD established both a Strategy and a Committee to help identify and implement its R&D requirements. However, the strategy expired in 1998-99, and the R&D Committee was disbanded in 1999. In the absence of a formal strategy, DARD undertook several initiatives between 2000 and 2009 which impacted on its R&D work. These included:

- 2000 - 'Vision Group' established to identify a broad range of actions which would further the strategic development of the agri-food industry in the coming decade;
- 2001 - the 'O'Hare review' commissioned to review R&D and education as part of a wider Departmental re-organisation;
- October 2005 - Research and Education Advisory Panel (REAP) established to advise on the strategic direction of the Department's R&D activities; and
- 2009 – Departmental Scientific Adviser (DSA) appointed.

5.22 However, DARD told us that the establishment of an updated overarching strategy for the direction of its R&D remained a key priority for the Department. Whilst this was not sufficiently developed when AFBI commenced operations in April 2006, the Department set out interim arrangements for the commissioning and

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approval of new R&D projects to be delivered by the Institute. These included:

- a requirement for AFBI to submit a written proposal in respect of all new DARD-funded R&D projects which it intended to commence; and
- an internal approval process within DARD, involving scrutiny of the AFBI proposal by the relevant Policy Director, and final approval by the Department's Strategy Board.

Simultaneously, DARD continued to work on the development of a strategy which would ensure that R&D commissioned from AFBI was fully commensurate with the Department's strategic objectives and policies. This ultimately resulted in the launch of DARD's Evidence and Innovation Strategy (EIS) in 2009. The EIS covers the period between 2009 and 2013, and encompasses four key goals which DARD had identified in its 2006 Strategic Plan as critical to the framework for its R&D programme (see **Figure 12** below).

5.23 Following stakeholder consultation, DARD issued a 'call for research' in December 2010, inviting AFBI to submit research project proposals compatible with the four strategic goals. Proposals were then evaluated by DARD and a programme of approved projects compiled for 2011-12. This was the first time since AFBI's establishment that the R&D commissioning process had been driven by DARD on the basis of a strategic policy-led approach. Such a process was also followed for 2012-13, and will be repeated annually.

5.24 The development of the EIS-based work programme was supplemented by a review of 79 ongoing R&D projects commenced before 2010-11 "to assess relevance and fit with the priorities identified in the EIS and to prepare a roadmap for realignment". As paragraph 4.44 noted, two-thirds of these projects were immediately terminated, with the remainder placed on a firm pathway to conclusion within a fixed budget and timeframe. In our view, the immediate termination of so many projects casts doubt on the robustness of the pre-EIS annual review process, under which

Figure 12: DARD's key Strategic Goals for Research and Development

Goal 1:	To improve performance in the Marketplace
Goal 2:	To strengthen the Social and Economic Infrastructure of Rural Areas
Goal 3:	To enhance Animal Health and Welfare, Fish and Plant Health
Goal 4:	To develop a more Sustainable Environment

Source: DARD

approval was given to continue these projects over successive years. This suggests that many projects were allowed to continue for prolonged periods without yielding significant or substantive benefits. DARD told us that its decision to terminate so many projects was not because these did not have scientific merits, or because they were incapable of delivering benefits. Rather, DARD stated that a prioritisation process was necessary to free up resources to the R&D projects which were best focused on its most pressing current and future policy needs.

addressing the Department's strategic objectives. We also consider that the revised commissioning process is likely to result in an improved targeting and prioritisation of funding towards projects with the greatest potential to deliver scientific and financial benefits to agri-food stakeholders. However, prior to this, the arrangements for identifying, commissioning and prioritising this research differed significantly in a number of key respects. The previous arrangements, together with the recently introduced improvements, are summarised in **Figure 13**.

- 5.25 From 2011-12, the EIS-based work programme has resulted in the DARD-funded R&D programme better

Figure 13: Previous arrangements for commissioning DARD-funded R&D work and steps taken to improve these

Previous arrangements	Improvements introduced
AFBI, rather than DARD, took the lead in drawing up proposals for new R&D projects.	From 2011-12, new projects are commissioned and prioritised annually on the basis of research priorities identified by DARD.
Limited scrutiny by DARD of the scientific merit of proposed new R&D projects.	From 2009-10, projects require approval by DARD's Departmental Scientific Adviser.
Limited and informal consultation with agri-food stakeholders.	From 2011-12, formal stakeholder consultation introduced.
Projects only required to demonstrate that they were likely to contribute to one of DARD's strategic objectives.	From 2011-12, more rigorous approval regime operated by DARD.

Source: NIAO, based on DARD records

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There are important lessons to be learnt from DARD's experience for other Departments in managing a new ALB in its early years

- 5.26 Overall, it has taken a considerable time to develop and embed a strong and comprehensive performance management and corporate governance regime within AFBI. Arising from our review, there are important lessons to be learnt from DARD's experience for other Departments faced with the challenge of overseeing the establishment of a new ALB:
- sufficient steps must be taken at an early stage to ensure that a work programme which defines the outputs required from the new ALB, and the costs of providing these is in place when, or shortly after the newly created organisation commences operations;
 - priority must be given to ensuring that a new ALB's financial systems are capable of generating the necessary financial and business planning information required to support good governance and assist both internal and Departmental oversight of the ALB's operations; and
 - strong and timely oversight is required to address the financial and operational risks associated with a new body, and ensure that measures are put in place to remedy inadequate performance.
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Appendix 1: AFBI performance for delivering scientific testing (see paragraph 3.7)

2008-09

AFBI established Business Plan (BP) targets to measure whether eight of its key categories of scientific tests were conducted to accredited standards, and whether pre-defined percentages of tests were completed within required time-scales. AFBI achieved seven of the eight targets, including high volume testing by Veterinary Services Division (VSD) for Brucellosis (over 1.1 million tests) and Virology (over 120,000 tests). Although a target for 90% of VSD's Bacteriology Brucella tests to be completed within three weeks was not achieved (actual performance was 85.8%), this testing involved a relatively low volume of samples (under 1,000).

2009-10

AFBI did not establish any formal BP targets for scientific testing. AFBI's Internal Audit identified the exclusion of these targets from the 2009-10 Business Plan as being "due to an oversight". However, AFBI did monitor the extent to which tests were completed to required time-scales (with the exception of some low-volume test categories). Figures supplied to NIAO suggested that all key high-volume test categories were delivered within the required times. However, in validating 2009-10 performance data, AFBI's Internal Audit identified issues with the accuracy of outturn figures for testing, and the lack of quality assurance of these. For example, whilst AFBI reported that VSD had undertaken 2.12 million statutory tests, Internal Audit could only validate 1.92 million. The figures supplied to NIAO by AFBI indicate that 1.79 million tests were undertaken by VSD. Given these discrepancies, we would express concerns over the accuracy and completeness of the 2009-10 performance data.

2010-11

AFBI did not have any formal BP targets for scientific testing, but did monitor and report performance against 18 different test categories on the basis of whether tests were carried out to required quality standards, and within agreed time-scales. AFBI achieved 17 of the 18 informal targets, including all those related to the high-volume test categories. Whilst performance reported for scientific testing by AFBI in 2010-11 could be viewed as strong, one qualification is that the outturn reported was subject to limited validation by AFBI's Internal Audit, owing to the fact that there were no formal BP targets in this area.

Appendix 2: Examples of qualitative AFBI Business Plan targets 2008 – 2011 (see paragraph 3.19)

Year	Business Plan targets
2008-09	<ul style="list-style-type: none"> • To publicise AFBI's EU recognition with a launch event. • To participate in five major championships (like the National Ploughing Championships and the Balmoral Show), that are relevant to AFBI's work. • Agree a new structure for ICT and Economics branches with the aim of increasing career development opportunities. • Further develop and enhance the process of manpower planning.
2009-10	<ul style="list-style-type: none"> • To further progress an expenditure appraisal for a new animal pathogen laboratory. • To finalise an AFBI Estates Strategy. • To review and assess the specialist scientific equipment across AFBI to determine its fitness for purpose and to identify future needs.
2010-11	<ul style="list-style-type: none"> • To roll out commercialisation training to AFBI staff. • To develop procedures in regard to filling vacant posts within AFBI. • To develop and begin implementation of a 3-Year AFBI Business Development and Marketing Strategy.

Appendix 3: AFBI seed potato breeding project - costs and outcomes to date (see paragraph 4.19)

Year	Business Plan targets
Costs of the project	<p>As there are no details of spend on the project between 1957 and 1981, the total cost is unknown. Records indicate at least £7.2 million spend since 1982 (£2 million between 1982 and 1994, and a further £5.2 million since 2006-07), but the lack of records before 1982, and between 1995 and April 2006, mean that costs are almost certainly higher.</p>
Success and ongoing viability of the project	<p>There is evidence of an annual review of the project by AFBI, but this was generally confined to short notes, highlighting the need to develop new seed potato breeds, and improve sales to Europe.</p> <p>Despite the substantial expenditure on the project, Northern Ireland seed potato production has declined markedly since 1982, when levels stood at 153,000 tonnes. Between 1982 and 1994, this declined to 55,400 tonnes, and fell further to 20,200 tonnes at 2010.</p> <p>DARD commissioned a major review of its support mechanisms to the Northern Ireland potato industry in 2004. This recommended that the Department continue supporting an element of potato breeding, but that the programme be progressively reduced over the following five years. If, by the end of 2010, the project was not generating revenue to cover at least 45% of costs involved, the review recommended that DARD assess its future.</p> <p>In response to these recommendations, DARD re-organised the programme into separate 'strategic' and 'commercial' elements, as it considered that this would make it easier to identify and continue to fund the strategic element. Whilst AFBI continues to undertake the 'strategic' element of the programme, a consortium comprising local potato merchants and an overseas seed company was formed in October 2010 to deliver the 'commercial' element. An agreement between AFBI and the consortium includes an objective for the 'commercial' element to achieve full cost recovery within five years. At this stage, DARD and AFBI intend reviewing the ongoing viability of the 'commercial' element of the programme.</p> <p>DARD has indicated to the local seed potato industry that this course of action represents a "last best chance" for them, with DARD and AFBI having the right to decide at that time whether the programme should be continued, reduced in scale or ceased altogether.</p>

Appendix 4: Case studies from the dossier submitted by AFBI to NIAO to illustrate the benefits of the DARD-funded R&D programme (see paragraph 4.40)

1. **Nitrates Action Programme Research**

This research has resulted in grain traders in Northern Ireland agreeing to lower phosphate levels in livestock feed. Consequently, important environmental benefits are anticipated, including a reduction in eutrophication levels in freshwater lakes in Northern Ireland. Scientific evidence shows that eutrophication has an adverse effect on water quality, and that reducing this helps to:

- lessen risks to human and animal health;
- reduce the cost of algae removal during water treatment; and
- avoid the loss of habitats and fisheries within waterways.

The project commenced in 2002, and although scheduled for completion in 2005, was only finalised in 2009, mainly due to delays in writing up findings. Whilst estimated costs were £0.29 million, actual project expenditure was £0.65 million (i.e. a £0.36 million overspend). A PPE for the project (March 2012) acknowledged that estimating benefits from reducing pollution in freshwater lakes in Northern Ireland was an “extremely complex issue”, but it did calculate “an approximate value” through using a methodology developed for England and Wales. This estimate suggested net benefits of £6.24 million over a six-year period.

2. **Plant Genetic Improvement Research**

The development of improved plant varieties is recognised as improving yield and profitability.

AFBI has undertaken plant breeding and variety testing to provide farmers with the opportunity to use the latest and most productive varieties. In terms of cereal production, the scientific community widely accepts an increase of 0.1 tonnes per hectare per year as a reasonable estimate of benefits delivered by introducing new varieties. On this basis, AFBI estimates that its research has generated an additional £0.68 million annually in the value of cereal grain produced in Northern Ireland. Whilst the total cost of this programme is unavailable, the net cost in 2010-11 was £0.32 million, and AFBI told us that annual costs are unlikely to vary significantly. On this basis, the project would deliver a benefit / cost ratio of 2.1/1.

AFBI also undertakes a grass breeding programme, aimed at benefitting the grazing livestock sector. In 2007, consultants engaged by AFBI concluded that this would deliver higher grass yields, thereby increasing livestock productivity and reducing animal feed costs. The resultant annual increase in profit margin for the sector was forecast at £0.92 million. Again, the total cost of this programme is unavailable. In 2010-11, net expenditure was £0.34 million, which would represent a benefit / cost ratio of 2.7 / 1. However, to date, there

has been no PPE assessment to confirm the actual benefits realised either from AFBI's cereal production work, or the grass breeding programme.

3. **Socio-Economic Policy Analysis**

AFBI's socio-economic policy analysis programme is funded by the four UK administrations. For the last fifteen years, it has provided analysis to support political negotiations at regional, national and international levels during EU CAP reform negotiations, as well as providing insights into the economic consequences of potential developments in World Trade Organization negotiations on GB and Northern Ireland agriculture.

AFBI told us that the use of its socio-economic research in EU negotiations has had a direct and positive impact on agri-food development in Northern Ireland. In particular, AFBI highlighted the influence of its analysis within negotiations on the decoupling of EU agricultural subsidies from production (possibly the biggest single policy reform affecting the agri-food sector since UK accession to the EU). AFBI's research demonstrated the potential positive impact of decoupling on the agricultural industry in Northern Ireland, thereby enabling DARD to support the UK negotiating stance in the CAP reform negotiations. The outcome of the negotiations saw Northern Ireland adopt a policy of decoupling of agricultural support to the maximum extent possible and at the earliest opportunity. AFBI told

us that its research had demonstrated economic efficiency gains from the full implementation of decoupling, with a £15.5 million reduction in industry costs in Northern Ireland in the first year, as well as unquantified savings in government administrative costs from implementation of the policy. The Institute told us that these benefits should be compared with the £196,000 annual cost of its research programme.

4. **Vaccines to prevent disease in pigs and salmon**

This research was conducted by Science Service between 1998 and 2002, and resulted in the development of vaccines to prevent disease in pigs and salmon. A commercial patent related to the discovery was first filed in 1999 (seven years before AFBI's establishment). AFBI continued to work with the licensee to achieve full commercialisation, and has subsequently received £9.3 million in royalty income between 2008-09 and 2010-11.

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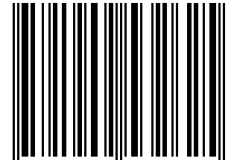
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