### **Agri-Food and Biosciences Institute**



Annual Report and Statement of Accounts 2007-08



Agri-Food and Biosciences Institute Annual Report and Accounts For the year ended 31 March 2008

Laid before the Northern Ireland Assembly under the Agriculture (Northern Ireland) Order, 2004 by the Department of Agriculture and Rural Development on the 21st January 2009.

#### Contents

		Page
	Foreword from the Chair	5
	Chief Executive's report	7
1	Management commentary	9
1.1	Scope	10
1.2	Performance	12
1.3	AFBI Board	18
1.4	Management Board	23
1.5	Financial matters	24
1.6	Other matters	25
2	AFBI Science	29
2.1	Our activities	30
2.2	AFBI Divisions	32
2.3	Sustainable Food and Farming Online crop nutrient recommendation program	33
	AFBI variety registration software goes to Serbia	
	Development of clover-check – a management decision system for grass/clover swards	
	Nutrient management planning	
	Mycobacterium avium subsp. Paratuberculosis (Map)	
	Phasing out milk quotas in the EU	
	First case of bovine complex vertebral malformation in Ireland	



2.4	Competitiveness in the agri-food industry	43
	Monitoring pesticide usage	
	Radio-tracking of sheep grazing on hill land	
	Launch of AFBI's cattle health scheme	
	Nicarbazin in poultry meat – questionnaire	
	Retinal imaging in cattle and sheep	
	DNA profiling of cattle	
	Beef eating quality	
	Adding value to milk	
	Beef calves from the dairy herd – opportunity to reduce costs	
2.5	Management and protection of natural resources	57
	Pesticides in apples and potatoes	
	Managing Northern Ireland's coastal zone	
	Is growth in land-based wealth sustaining part-time farming?	
	Optimal beef and sheep production systems	
	in the less favoured areas (LFA)	
2.6	Climate change and renewable energy	65
	Biomass crops in Northern Ireland	
2.7	Scientific preparedness for emergencies	67
	Bluetongue vectors: a Northern Ireland perspective	
	Bluetongue testing	
	Avian influenza	
2.8	Events and visits	71
	Minister's visit to AFBI Stormont	
	Farm woodland forum	
	Chilean Ambassador	
	Plant nematology workshop	
	Minister's visit to Corystes	
	CARAS visit to AFBI Loughgall	
	Training visits to AFBI Stormont	

3.	Finance	77
3.1	Remuneration report	78
3.2	Statement of internal control	84
3.3	Statement of Accounting Officer's Responsibilities	88
3.4	Audit certificate	89
3.5	Accounts	92
3.6	Notes to the Accounts for the year ended 31 March 2008	95

# Foreword from the Chair



It gives me great pleasure to introduce the Annual Report and Accounts for the Agri-food and Biosciences Institute (AFBI) for 2007/08.

AFBI has enjoyed another successful year and I am pleased to report its continued development on a number of business fronts.

The AFBI Board has met monthly throughout the year and has gained extensive and detailed insight into the nature and extent of the complex and multi-disciplinary science programmes in AFBI. Through a number of structures and mechanisms the Board has continued to fulfil its obligations on corporate governance. This essential requirement has been addressed within the context of delivering good scientific services to all our customers.

The good governance of AFBI is set from the top and the Board is very aware that it must continue to adhere to and promote the right behaviours and values rather than simply complying with a regulatory framework. As I explained previously, the board's audit committee includes representation from both our internal auditing staff and representatives from the Northern Ireland Audit Office.

Our aim is to ensure that AFBI becomes recognised with both the development of new ideas and the reliable delivery of scientific services to customers. This key role of supporting and facilitating local government and industry will help ensure Northern Ireland remains competitive. The board and management are committed to creating an environment in which staff performance and innovation are rewarded.

AFBI continues to promote itself actively at home and abroad. This remains a critical element of our strategic business development so that AFBI maintains and enhances its work with a cross-section of organisations within the public and

private sectors locally, nationally and internationally. While DARD is our main customer and commissions over 80% of our programme we have also extended our customer base in both the public and private sectors.

The Deputy Chair, Professor David McDowell and my other fellow Board members continue to participate with enthusiasm and from a wide base of specialist knowledge and skills. I thank each of them for their excellent help and support throughout the year both to me as Chair and to the institute of AFBI. The commitment of our Chief Executive, Dr George McIlroy is a major factor in our achievements this year. The Executive Team continue to develop Human Resource and management systems for all aspects of our business and the Board is grateful for the help and support they have provided. AFBI is a multi-disciplinary organisation applying leading-edge science and technology to a wide range of topics within the agri-food sector. I am confident that, given our progress in 2007/08, we are well able to grow and expand our local, national and international customer base in the coming year. This and our continued scientific excellence bodes very well for the future of our organisation.

Seán Hogan Chair

## Chief Executive's Report



I am pleased to present my report for the Agri-food and Biosciences Institute (AFBI) for 2007/08.

During the year we have continued to provide extensive scientific services to our key client DARD and over 80% of AFBI's activities have been devoted to this major customer. However, I can also report that our staff have been very successful in securing funding of over £8M from the private sector and both national and international government bodies other than DARD and this bodes well for our continued strategic business development in this critical area.

Following our first year as AFBI, we have continued to review and manage our activities in ways that meet the needs of our staff and customers. We have worked steadily on our administrative procedures and have new finance, personnel and procurement systems embedded and successfully audited by both our internal and external auditors.

Science is our business and we have continued to ensure via internationally recognised accreditation regimes and ISO standards that our scientific research and analytical testing capabilities and facilities are fit for purpose to meet today's regulatory and commercial standards. This is a critical element in our maintenance of existing business and the securing of new customers and successfully continuing our business strategy in a highly competitive national and international scientific market.

I am confident that today we have the scientific skills and expertise together with specialist facilities and the flexibility to deliver scientific services to both government and the commercial market. This is critically important in maintaining our capability to deliver an efficient and effective emergency response capability to Government for the benefit of the local community and Northern Ireland Plc.

We continue to maintain and expand good working relationships with other centres of research and scientific excellence and partnerships of this nature represent the way forward. This is particularly important for EU funding such as the Framework 7 funding programme which awards significant levels of funding for internationally co-ordinated research projects. This brings new and additional funding into Northern Ireland and our business links with other centres of scientific excellence will only be pursued where they offer a prospect of benefitting the local economy and the rural and urban communities.

I am confident that AFBI will successfully tackle all of these challenges and opportunities and that we will continue to build on our already high reputation as a centre of excellence for both agri-food science and related environmental and renewable energy sciences throughout Europe and beyond. My staff have worked hard throughout 2007/08 to ensure AFBI maximises its opportunities to serve all our customers with effective and efficient services and I look forward to continued sustainability of the Institute in our highly competitive and complex business environment in agri-food and biosciences.

George McIIrov MVB MSc PhD MRCVS Chief Executive and Accounting Officer

Section 1 Management Commentary

#### 1.1 Scope

#### Boundary

The Agri-food & Biosciences Institute presents its accounts for the financial year ended 31 March 2008. The Institute was formed on 1 April 2006 with the amalgamation of the Department of Agriculture and Rural Development (DARDNI) Science Service division and the Agricultural Research Institute of Northern Ireland, which was a separate Non-Departmental Public Body funded by DARDNI. The Institute is established under the Agriculture (Northern Ireland) Order, 2004.

#### Accounts Direction

The accounts have been prepared under the Accounts Direction given by the Department of Agriculture and Rural Development, with the approval of the Department of Finance & Personnel, in accordance with the Agriculture (Northern Ireland) Order 2004.

#### **Mission Statement**

AFBI's mission is to further develop a reputation as a world class scientific institute, delivering proven value to Government and to customers.

#### Aims

The corporate aims of AFBI are to:

- deliver statutory scientific programmes in the area of agri-food, animal and plant health and the environment;
- pursue scientific programmes for DARD and other customers which are designed to:
  - improve performance in the market;
  - safeguard animal and plant health;
  - maintain and invest in the environment;
  - build a successful rural economy and society;
- ensure AFBI's resources are adequately equipped to meet the challenges of change;
- provide high quality cost-effective services;
- correct market failure in agri-food R&D, particularly where commerce finds such work difficult and unattractive by virtue of specialist facilities and skills required and their long term maintenance;
- provide access to specialist expertise and facilities for both industry and public sector bodies for contracted scientific services;
- become the partner or contractor of choice for local, national and international scientific programmes and contracts in chosen areas of expertise;
- maintain a critical mass of appropriate skills and resources to be able to provide an emergency response capability for DARD;
- develop the science base in Northern Ireland to contribute to local, national and international efforts where appropriate.

AFBI has an important role in assisting DARD to achieve its objectives. DARD's objectives are:

Objective 1: Improving performance in the market.

Objective 2: Safeguarding animal fish and plant health.

Objective 3: Maintaining and investing in the environment.

Objective 4: Building a successful rural economy and society.

AFBI supports DARD's objectives by delivering:

- statutory, analytical and diagnostic work,
- research and development,
- specialist scientific advice,
- an emergency response capability in the context of animal and plant disease outbreaks and other emergencies in the food and environment areas.

#### Funding

AFBI is an NDPB sponsored by DARD and is funded through Grant-in-Aid. The Grant-in-Aid is voted in DARD's Estimate and will be subject to Assembly control. AFBI's current and capital expenditure form part of DARD's Resource DEL and Capital DEL respectively. AFBI also raises funds through receipts generated in the course of its operating activities. In 2007/2008, the grant-in-aid amounted to £42m.

#### Relationship with DARD

AFBI's main point of contact with DARD is the AFBI Sponsor Branch in the department. Regular meetings are held with the Sponsor Branch where matters relating to corporate governance, performance measurement, budgets, financing and accountability matters are discussed.

AFBI's responses to the quarterly monitoring rounds, Comprehensive Spending Reviews are all routed through the Sponsor Branch.

#### Relationships with other Government Departments and agencies

AFBI continues to co-operate on a number of projects with Queen's University. AFBI has also embarked upon developing close working relationships with universities in the Republic of Ireland, Scotland, India and the United States of America.

## Relationships with educational establishments

AFBI continues to co-operate on a number of projects with Queen's University. AFBI has also embarked upon developing close working relationships with the University of Ulster and universities in the Republic of Ireland, Scotland, India and the United States of America.

#### Marketing

AFBI has strengthened its marketing team in order to enable it to look for wider markets for its services and expertise and to widen its income stream.

#### **1.2 Performance**

AFBI Internal Audit carried out an independent validation of the achievement of the 2007/08 business plan objectives and targets. AFBI fully achieved 8 of the 16 key objectives within the timeframes set in the Business Plan 2007/08. Table 1.1 is a summary of our assessment of outturns against the targets.

In 2007/08 the targets and performance were as follows:

## Table 1.1:Summary Assessment of Outturns (taken from Business Plan 2007/08)

No.		Objective				Assessment of Achievement	
Objective 1	To con- accord	To conduct a programme of scientific testing in accordance with accredited standards.					ot Achieved
DARD Statutory	laigete	DARD Dia	ignostics	Other GB / NI Depts			Private
Target	Outturn	Target	Outturn	Target	Outturn	I	
7,000 to 7,500	7,307		-	1,200 to 1,500	1,413		10,000 to 11,000
3,500 to 4,000	4,025		-	400 to 500	1,471		500 to 600
1,600,000 to 1,900,000	2,051,530	140,000 to 170,000	194,500	3,400 to 4,000	4,081		250,000 to 300,000
1,610,500 to 1,911,500	2,062,862	140,000 to 170,000	194,500	5,000 to 6,000	6,965		260,500 to 311,600

The overall target number of tests and turnaround times was achieved. However, test numbers were below the forecast range in some of the divisional targets that are a subset of the overall target.

No.		Objective					Assessment of Achievement	
Objective 2	To carry out R&D projects	To carry out work on commissioned R&D projects in accordance with accredited standards.				Not Achieved		
	Targets:							
Division	DARD Target	Outturn	NI/GB Departs Target	Outturn	C Taro	omn aet	nercial Outturn	
AFESD	72	64	10	18	43	3	45	
APSD	35	35	1	1	18	8	23	
VSD	9	10		· ·	12	2	20	
AFEB	7	7	_		3	-	3	
Total	123	116	11	19	76	6	91	
Objective 3	To develop a Corporate Plan to align with the 2008 Comprehensive Spending Review (CSR) period 2008–11. Target: To have a near final Corporate Plan 2008–11 drafted for approval by the AFBI Board for submission to DARD by January 2008.				Achieved			
Objective 4	To increase in sources com Target: To carry out 2 non-DARD £6.3 million f	ncome by 7 pared to 20 work on 81 SLAs and from all nor	10% from all non-E 006-07 target. externally funded accrue income of n-DARD sources b	DARD contracts, at least y 31 March	ח 200	8.	Achieved	

No.	Objective	Assessment of Achievement
Objective 5	<ul> <li>To identify and prioritise key areas of the business with growth potential.</li> <li>Targets: <ul> <li>To identify a key area in each Division with potential for business growth by 31/3/08;</li> <li>To establish business development processes within AFBI by 31/12/07; and</li> <li>To conduct a comprehensive Business Impact Analysis by 31/3/08.</li> </ul> </li> </ul>	Not Achieved
Objective 6	<ul> <li>To increase awareness of AFBI within scientific and business communities.</li> <li>Targets: <ul> <li>To display at 5 major exhibitions (including the National Ploughing Championships and the Balmoral Show) relevant to AFBI's work during 2007-08;</li> <li>To enable 70 members of staff to represent AFBI (DARD where appropriate) on 300 national/ international committees, editorial boards, professional organisations and development groups;</li> <li>To publish 100 refereed papers in scientific journals during 2007– 08; and</li> <li>To publish 100 popular articles during 2007 – 08.</li> </ul> </li> </ul>	Not Achieved
Objective 7a	<ul> <li>To develop a robust system to measure customer satisfaction with AFBI services.</li> <li>Targets:</li> <li>To establish baselines for stakeholder awareness and customer satisfaction by 31/3/08; and</li> <li>To identify appropriate measures and processes to record customer satisfaction levels by 31 March 2008.</li> </ul>	Achieved

No.	Objective	Assessment of Achievement
Objective 7b	To communicate the value of AFBI's R&D programme to a wider audience of stakeholders.	Not Achieved
	<ul> <li>Target:</li> <li>To draft a communications strategy for AFBI focusing on raising stakeholder awareness of AFBI's R&amp;D programme by 31/3/08.</li> </ul>	
Objective 8	To develop further the Institute's Human Resource strategy.	Not Achieved
	<ul> <li>Targets:</li> <li>To develop a succession plan by 31/3/08;</li> <li>To develop an age discrimination policy by 31/3/08;</li> <li>To develop a Workforce plan taking account of the 2008 CSR outcome, external income projections and pending retirements by 31/3/08;</li> <li>To implement an agreed Rewards to Staff scheme by 31/3/08; and</li> <li>To develop a Training and Development Strategy by 31/3/08.</li> </ul>	
Objective 9	To analyse and quantify overheads within scientific activities.	Achieved
	<ul> <li>Targets:</li> <li>To identify and prioritise work areas and practices where efficiencies could be realised by 31/3/08;</li> <li>To map all AFBI activities to a specific customer and agree terms of business by 31/3/08; and</li> <li>To review procurement procedures and set procurement savings targets by 31/3/08.</li> </ul>	nt

No.	Objective	Assessment of Achievement
Objective 10	To develop further the internal management information systems which support decision making processes in operational divisions.	Not Achieved
	<ul> <li>Targets:</li> <li>To have in place a fully functioning activity costing system by 31/3/08; and</li> <li>To provide regular management information reports to budget holders within 6 working days of the month end. System to be fully operational by 31/3/08.</li> </ul>	
Objective 11	To agree with DARD their minimum requirements for an emergency response capability in line with the Agriculture Order 2004.	Not Achieved
	<ul> <li>Target:</li> <li>To have in place an MoU between AFBI and DARD on working together in emergency situations by 31/10/07; and</li> <li>To draft a Business Continuity plan supporting the continued delivery of AFBI's high priority work by March 2008.</li> </ul>	
Objective 12	To agree with other relevant clients their minimum requirements for an emergency response capability in line with their needs.	Achieved
	<ul> <li>Target:</li> <li>To update the AFBI Corporate Contingency Plan defining the emergency response requirements of DARD and other clients by 31/3/08.</li> </ul>	

Objective	Assessment of Achievement
To review Health and Safety policies and procedures to ensure they are fit for purpose and up to date.	Achieved
<ul> <li>Targets:</li> <li>To review and publish revised Health and Safety policies and procedures for AFBI by 31/3/08; and</li> <li>To implement an AFBI H&amp;S advisory group which will thereafter provide bi-annual updates to the AFBI Board and SMT by October 2007.</li> </ul>	
To achieve all necessary science accreditation for the delivery of customer services.	Achieved
<ul> <li>Target:</li> <li>To complete all outstanding accreditation and create an assurance framework evidencing all relevant science accreditation by 31/3/08.</li> </ul>	
To review Risk Management policies and procedures to ensure they are fit for purpose and up to date.	Achieved
<ul> <li>Targets:</li> <li>To review and publish revised Risk Management policies and procedures by 31/3/08; and</li> <li>To publish a Risk Register and report quarterly to the Board on the movement and management of risks.</li> </ul>	
	Objective         To review Health and Safety policies and procedures to ensure they are fit for purpose and up to date.         Targets:         • To review and publish revised Health and Safety policies and procedures for AFBI by 31/3/08; and         • To implement an AFBI H&S advisory group which will thereafter provide bi-annual updates to the AFBI Board and SMT by October 2007.         To achieve all necessary science accreditation for the delivery of customer services.         Target:         • To complete all outstanding accreditation and create an assurance framework evidencing all relevant science accreditation by 31/3/08.         To review Risk Management policies and procedures to ensure they are fit for purpose and up to date.         Targets:         • To review and publish revised Risk Management policies and procedures to ensure they are fit for purpose and up to date.         Dargets:         • To review and publish revised Risk Management policies and procedures to ensure they are fit for purpose and up to date.         Dargets:         • To review and publish revised Risk Management policies and procedures by 31/3/08; and         • To publish a Risk Register and report quarterly to the Board on the movement and management of risks.

#### 1.3 AFBI Board

AFBI is managed by a Board which has responsibility for providing strategic leadership for the organisation, ensuring that it fulfils the delivery objectives set by the Department of Agriculture and Rural Development (DARD) and for promoting the efficient and effective use of staff and other resources by AFBI.

The main responsibilities of the Board are:

- to ensure that AFBI meets its agreed objectives and targets as set by the DARD Minister, and set down in the Management Statement and Financial Memorandum;
- to provide strategic leadership in the formulation of AFBI's strategy for the discharge of its responsibilities, taking account of the Minister's and DARD's priorities, as outlined in the science and technology strategies and in Service Level Agreements (SLAs) set by DARD and other AFBI customers;
- to ensure that effective arrangements are in place to provide assurance to DARD and the Minister on risk management, governance and internal control;
- to communicate AFBI's strategy and services to stakeholders in NI and beyond;
- to understand and articulate science and research and development needs and advise the Chief Executive on drawing these requirements into the formulation of a strategic plan for AFBI;

- to oversee AFBI's functions, including encouragement of the highest standards in the disbursement of finance, and the efficient and effective use of staff and other resources throughout AFBI;
- to represent AFBI to its key audiences, for example industry, academic institutions and other research providers, locally, nationally and internationally.
- to engage with the Minister and DARD on matters pertaining to the work of AFBI and its strategic direction and input to the overall DARD strategic objectives.
- to identify and assess current and future developments in the agri-food and rural economy sector, and to recommend opportunities to expand into new markets and innovations to meet customers' needs.

#### Role of the Chairperson of AFBI

The Chairperson is responsible to the Minister. The Chairperson shall ensure that AFBI's policies and actions support the wider strategic policies of DARD and that AFBI's affairs are conducted with probity. The Chairperson shares with other AFBI Board members the corporate responsibilities set out in the MSFM, and in particular for ensuring that AFBI fulfils the aims and objectives set by DARD and approved by the Minister. The Chairperson shall also set performance measures for the board corporate and individual board members.

#### **Board Members**

Members are appointed in accordance with the Office of the Commissioner for Public Appointments (OCPA) NI Code of Practice. The terms of appointment of members are for either two or three year periods, with the Chair appointed for four years. The Chair receives an annual remuneration of £24,480 and is expected to commit approximately 40 days per annum to the post. The Deputy Chair receives £10,200 and has a commitment in the region of 20 days per annum. Members are expected to commit in the region of 15 days per year and receive £3,670.



#### Chairperson Mr Seán

Hogan lives in Newry. He is a Masters graduate from Queen's University Belfast in Organisational Management, is a Fellow of both the Chartered Management Institute and

the Institute of Marketing Management, and a Member of the Institute of Directors. Mr. Hogan is also a consultant with STH Management Solutions Ltd and a member of the Warrenpoint Harbour Authority. He is a Health Commissioner for the Southern Health Commissioning Group (DHSSPSNI).



Deputy Chairperson Professor David McDowell lives in Carrickfergus. He has a PhD from the University of Ulster and is a Chartered Biologist. Professor McDowell is currently the Head of Food

Microbiology at the University of Ulster. He is also a member of the Food Standards Agency NI Advisory Committee, Chair of the Advisory Group, ProSafebeef and Vice-Chair of the Safefood Scientific Advisory Committee, a voluntary position.



Mr Kieran Campbell lives in Newry. He has an MSc in Corporate Leadership and is a Chartered Accountant with 20 years' experience in senior finance and management roles. He is currently a principal within

a property development and investment business.

Mr Campbell is also a member of the Warrenpoint Harbour Authority.



Dr Michael Hollywood lives in Belfast. He holds a PhD in Atomic Physics, from Queen's University. Dr Hollywood is a selfemployed management consultant. He was formerly Head of Scientific Research at the Gallaher Ltd Group.



Dr Christine Kennedy lives in Donaghadee. She has a PhD from the University of Ulster. She is a partner in a dairy and beef farm. She also serves as an Independent Assessor for the Office of the Commissioner for Public Appointments

(OCPA) and for management consultants PricewaterhouseCoopers. Dr Kennedy holds numerous voluntary positions, including membership of the UFU's Board and chairs Donaghadee Primary School Governors. She is a present member of the DARD Tribunal Review Panel and the Oversight Committee of the Rural Development Programme and has previously held a number of public appointments.



Mr Nicholas Mack lives in Newcastle. He has an MSc in Agricultural and Rural Policy and over 20 years' experience in rural development in Scotland, the Republic of Ireland and Northern Ireland. He

was previously the Director of the Rural Development Council's (RDC) Policy and Innovation Research Unit.



#### Professor Grace Mulcahy

lives in Co Wicklow. She qualified as a veterinary surgeon from University College Dublin (UCD), from where she subsequently gained a PhD. She is currently Professor of

Veterinary Microbiology and Parasitology and Dean of Veterinary Medicine at UCD and is a Foundation Diplomate of the European College of Veterinary Parasitology. Professor Mulcahy is also a member of the Veterinary Council of Ireland, a voluntary position.



Mr John McKinley lives in Ballycastle. He has a BAgr and Postgraduate Certificate in Education from Queen's University; completed a Business Start Up programme through the University of Ulster and a Corporate Manager

programme with the Industrial Development Board. Mr McKinley runs his own beef and sheep farm and is also a consultant in food products, marketing, and tourism and environmental projects. He also works as an agri-environment skills instructor via the Department of Agriculture and Rural Development (DARD) organised workshops.



#### Professor Stewart McNulty

lives in Belfast. He qualified in veterinary medicine from Trinity College, Dublin, from where he also gained a PhD. Professor McNulty retired as Chief Veterinary Research Officer with DARD Science

Service in 2001. He is currently a member of the Health Promotion Agency Board, NI, a voluntary position.





Mr James Noble lives in Newtownards. He has an MSc from Queen's University and several qualifications in dairying. Mr Noble has previously held a number of public appointments and is

currently a member of the Livestock and Meat Commission.



Mr John Rankin lives in Newtownards and has run his own dairy farm for over 40 years. He is a former President of the Ulster Farmers Union and a former ARINI Trustee, a voluntary position. He is currently a

member of the Agricultural Wages Board and Chairman of NFU Mutual NI Regional Board.



Mr Michael Walker lives in Newtownabbey. He has an MSc from Queen's University and is a Fellow of the Royal Society of Chemistry (RSC). He holds the RSC's Masters degree in Food, Drugs and

Water. He is a self-employed consultant on food and water issues, civil and criminal litigation. Mr Walker has held a number of public appointments in recent years and is currently a member of the NI Food Advisory Committee of the Food Standards Agency.

#### **Board Sub-committees**

There are two sub-committees of the Board.

#### **Remuneration Committee**

The Remuneration Committee is a non-executive advisory committee whose role is to advise the Chair of the AFBI Board in respect of remuneration of the Senior Executive Officers. Whilst, the terms and conditions of employment and remuneration of AFBI employees are within the overall NICS terms and conditions of employment any proposed changes within this overall framework will be subject to review by the Remuneration Committee. During the year, the membership of the Remuneration Committee was:

Non-executive Chair **Professor David McDowell** 

Non-executive Director Dr Christine Kennedy

Non-executive Director Mr Kieran Campbell

#### Audit and Risk Committee

The Audit Committee advises the Board and Accounting Officer on issues of risk, internal control, governance and any material items affecting the accounts. The Audit and Risk Committee is a sub committee of the AFBI Board and is an independent advisory committee with no executive functions. During the year, the membership of the Audit and Risk Committee was:

#### Audit Committee

Non- executive Chair Dr Michael Hollywood

Non-executive Director Mr John Rankin

Non-executive Director Mr Kieran Campbell

#### Other Attendees

Head of Internal Audit Ms Cara McCrory

Chief Executive AFBI Dr George McIIroy

Head of Business Support Mr Stephen Dolan

Head of CE's Office Dr Robin Boyd

Northern Ireland Audit Office Ms Karen Beattie

#### 1.4 Management Board

The Management Board of the Institute was as follows:

- Chief Executive Officer Deputy Chief Executive Officer Deputy Chief Executive Officer Deputy Chief Executive Officer Head of Chief Executive's Office Head of Business Support Unit
- Dr George S McIlroy Dr Sydney Neill Dr Michael Camlin Dr Seamus Kennedy Dr Robin Boyd Mr Stephen Dolan

The Executive Board meets at least monthly with a standing agenda covering resources, operational management, health and safety and business development. The minutes of these monthly meetings are available on AFBI intranet.

#### Role of the Accounting Officer

AFBI's Chief Executive is designated Accounting Officer for the NDPB by the Departmental Accounting officer and as such is accountable to Parliament for AFBI's use of resources as set out in the Management Statement and Financial Memorandum (MSFM). In particular, the Accounting Officer shall ensure that:

- AFBI's strategic aims and objectives support DARD's wider strategic aims and current PSA objectives and targets;
- the financial and other management controls applied by DARD to AFBI are appropriate and sufficient to safeguard public funds and for ensuring that AFBI's compliance with those controls is effectively monitored ('public funds' include not only any funds granted to AFBI by the Assembly but also any other funds falling within the stewardship of AFBI);

- the internal controls applied by AFBI conform to the requirements of regularity, propriety and good financial management; and
- any Grant-in-Aid to AFBI is within the ambit and the amount of the Request for Resources and that NI Assembly authority has been sought and given.

#### Details of significant interests held by the Management Board members

The Management Board Members do not hold any other directorships nor any other significant interests which may conflict with their management responsibilities.

#### 1.5 Financial Matters

#### Remuneration of auditors

The auditors did not carry out any non-audit work.

#### Financial results for the year

AFBI's operating cost statement shows a net operating cost of £47,432k. Within this net position AFBI raised income of £8,240k. During the course of the year AFBI identified additional income streams from existing partners by clarifying the commercial relationship between AFBI and its customers. Service Level Agreements are agreed with FSANI and DCAL securing funding in these important areas of work. AFBI presented monthly financial reports to the AFBI Board and reviewed expenditure against budget at the Senior Management Team Meetings to ensure that AFBI's expenditure did not exceed its budgeted resources. This reporting mechanism is subject to review, a number of improvements were identified in year and a business transformation project established to implement a new Time Recording and Costing System and a new HR System.

At the year end of the net assets of AFBI is £5,541.

## Events Since the End of the Financial Year

There have been no significant events since the end of the financial year which would affect the results for the year or the assets and liabilities at the year end.

#### Future Funding

Over the next two years AFBI faces increasing payroll costs, increases in utilities and increasing costs of animal feedstuffs. The dual impact of these factors requires AFBI to realise increased income from other sources and to increase the efficiency of its operations. AFBI is committed to widening its funding base and increasing its level of funding year on year. AFBI has developed strategies to improve efficiency through improved asset usage. In conjunction with the Strategic Investment Board AFBI is implementing a revised business and science strategy to maximise AFBI's commercial role and maintain its customer base. AFBI continues to develop its relationships with Invest NI and the EU to realise significant new sources of funding through these agencies.

#### 1.6 Other Matters

#### Career Development

AFBI carried out revisions to the structure of Biometrics and Information Branch and Agricultural and Economics Branch. These reviews took into account the changing work demands following the creation of AFBI and the skills required. The result is improved career structures in both Branches, AFBI undertook an assisted review of its Human Resources Policies and consulted a range of staff across the divisions in respect of career development. The resulting report highlighted many areas where improvements can be made. A draft People Strategy was prepared based on the findings of the report. The key messages will be disseminated to staff and the recommendations implemented during 2008-2009 following approval by the AFBI Board.

This year a total of 11 staff in the scientific discipline achieved promotion.

#### Recruitment

AFBI's recruitment service was transferred to a new provider as part of the HRConnect initiative. Whilst some delays occurred in recruitment there were a total of 53 appointments covering both the Industrial and Non-Industrial disciplines. AFBI in common with a number of employers in NI encountered difficulties in recruiting staff with specific skills. A review of promotion competitions to date identified some immediate changes to the scale and nature of AFBI's advertisements and some longer terms measures to improve the attractiveness of AFBI as an employer.

#### Environmental

AFBI is developing terms of reference for the management of its impact on the environment. A specific appointment will be made to manage this important aspect of AFBI's operations.

#### Social

AFBI does not have a policy covering corporate and social responsibility.

#### Internal Audit

An independent firm of auditors provides internal Audit services to the AFBI Accounting Officer and provides senior management and the AFBI Audit and Risk Committee with assurances of the adequacy of AFBI's systems of internal control and risk management. The DARD Internal Audit Unit complements the AFBI Internal Audit resource by completing specific tasks and undertaking a quality assurance role. The internal audits of AFBI provide assurances to the DARD Accounting Officer, DARD Sponsor Branch and the DARD Audit and Risk Committee that AFBI complies with the terms of the Management Statement and Financial Memorandum and other relevant legislative requirements.

#### **Risk Management**

AFBI has a Risk Management Strategy and associated Risk Registers subject to scrutiny by the Institute's Internal Auditors. Risks are reviewed monthly at a divisional level and reported monthly on an exception basis to the SMT and the AFBI Board. The Corporate Risk Register is reviewed quarterly by the Audit and Risk Committee and Internal Audit reviews the risk management process every year.

## Performance Assessment of the AFBI Board

Arrangements are in place for an annual self assessment exercise by the AFBI Board to review and refine the objectives of the Board. The Chair of the AFBI Board also sets targets for the AFBI Board and assesses the performance of the individual Board members on behalf of DARD Sponsor Branch. The Performance of the AFBI Chair is assessed by DARD Sponsor Branch.

## Compliance with HM Treasury Code of Good Practice on Corporate Governance

AFBI complies with the HM Treasury Code of Good Practice on Corporate Governance and generally complies with the Combined Code on Corporate Governance 2003. All the Directors of the AFBI Board are Non-executives and the Audit and Risk Committee and the Remuneration Committee Chairs and Members are all Non-executives.

#### Supplier Payment Policy

AFBI shall endeavour to pay 95% of all matured and properly authorised invoices in accordance with the terms of contracts or within 30 days, as provided for in Section 16.3 of Government Accounting Northern Ireland. AFBI shall comply with the British Standard for Achieving Good Payment Performance in Commercial Transactions (BS 7890), and with the Late Payment of Commercial Debts (Interest) Act, 1998 as amended and supplemented by the Late Payment of Commercial Debts Regulations, 2002. DAO(DFP)12/98 and DAO(DFP)19/02 refer. (NOTE: Under the 1998 Act creditors are allowed to claim statutory interest and compensation on late payment of commercial debts). In 2007/08, 88.63% (2006/07, 87%) of the invoices were paid in accordance with the terms of the contract or within 30 days.

#### **Disabled Employees**

It is the Institute's policy to give equality of opportunity when considering applications from disabled persons. The Institute complies with all existing legislation in respect to its disabled employees.

#### Equality of Opportunity

The Institute's policy is to give all eligible persons an equal opportunity for employment and advancement on the basis of their ability, qualifications and aptitude for the work.

#### Employee Involvement

AFBI maintains regular communications and contact with staff and managers through meetings, team briefings, seminars, bulletins and postings on the intranet. It also has well established arrangements for formal consultation with recognised Trade Union representatives on all significant developments affecting staff.

#### Health and Safety

AFBI complies with all relevant Health and Safety legislation and where practicable with all Health and Safety best practice. AFBI has a team of dedicated Health and Safety advisers and a system of Health and Safety Committees throughout the Institute.

#### Audit of Accounts

The financial statements are audited by the Comptroller and Auditor General for Northern Ireland. As Head of the Northern Ireland Audit Office, he and his staff are wholly independent of the Institute and findings are reported to Parliament. The annual fee for the audit of financial statements for 2007-08 was £39,000 (2006/07, £50,000).

#### Disclosure of Information to the Auditor

All information deemed by the auditor to be relevant to their investigations is made available. The Chief Executive, as AFBI's Accounting Officer, has taken all steps to make himself aware of any relevant audit information and to establish that the auditors are aware of that information and have access to it.

Section 2 AFBI Science

#### 2.1 Our activities

#### Statutory work

Statutory analytical and diagnostic work is carried out under EU Directives and local and national legislation. It plays a critical role in:

- facilitating rapid diagnosis and control of major animal disease outbreaks;
- detecting changing animal disease patterns and emergence of new diseases;
- detection of animal diseases and infections posing a risk to human health;
- food safety;
- plant health;
- fish stock management.

It consists of:

- provision of a specialised disease diagnostic service for veterinary practitioners, poultry organisations and fish farmers in Northern Ireland;
- provision of analytical testing to monitor the freedom of Northern Ireland food producing animals from notifiable and exotic diseases and from illegal concentrations of veterinary drugs;
- statutory testing services on a range of food products, environmental samples and animal feed components;
- provision of an analytical advisory/ diagnostic service for the local food industry;
- analytical services relating to residue testing, including shellfish monitoring, fish monitoring and national surveillance programmes in food chemistry;

- food irradiation detection, radionuclide analytical and radiation monitoring services;
- provision of an analytical advisory/ diagnostic and a sensory evaluation service for the local food industry;
- statutory activities associated with the legislative control, market release and innovative exploitation of varieties of the primary commercial plant species in Northern Ireland;
- UK testing centre for distinctness, uniformity and stability (DUS) for new varieties of herbage crops;
- UK National List Trials for herbage and the major cereal crops;
- Recommended List Trials for all the major grass, clover and cereal crops and potatoes;
- provision of a specialist analytical and diagnostic service to the N. Ireland Horticultural Industry;
- surveys to monitor plant pests, weed and disease incidence, fungicide resistance and pesticide usage;
- statutory and advisory diagnostic tests for scheduled crop pests, Potato Cyst Nematodes, bees, seed diseases, forest pests and diseases and potato wart and virus diseases;
- assessment and rational management of marine commercial fish stocks.

#### Research and Development

 In addressing the research objectives of DARD and our other customers, we provide a sound, scientific basis for government policy on agriculture and the environment and also underpin commercial development in the agri-food private sector.



In managing our R&D programme we:

- maximise interaction in order to achieve value for money and to ensure that, where possible, multiple objectives can be addressed simultaneously;
- manage programmes flexibly to ensure that both short and long term goals can be achieved and delivered effectively;
- together with the customer, review our R&D programmes regularly to ensure that they:
- meet customer requirements;
- are conducted to the highest quality standards;
- address scientific opportunities;
- deliver agreed outcomes effectively and efficiently;
- develop relevant national and international collaboration;
- protect and manage any intellectual property that arises.

#### 2.2 AFBI Divisions

AFBI has 3 main scientific divisions and a specialist economics branch:

## Agriculture, Food and Environmental Science Division (AFESD)

AFESD undertakes basic, strategic and applied multidisciplinary research, relevant to achieving efficient and responsible practices in sustainable farming, food, fishing and aquaculture industries, whilst conserving and enhancing the terrestrial and aquatic environments and thus supporting Northern Ireland's rural communities.

#### Applied Plant Science and Biometrics Division (APSBD)

APSBD undertakes basic, strategic and applied research in the plant sciences which, taking into account implications for the environment, aims to underpin sustainable economic growth and development in the countryside of Northern Ireland. It also provides a professional Statistics and ICT service for the Institute as a whole.

#### Veterinary Sciences Division (VSD)

VSD undertakes basic, strategic and applied multidisciplinary research in animal health and food safety which aims to underpin sustainable economic growth and development of the agri-food industry in Northern Ireland.

## Agricultural and Food Economics Branch (AFEB)

AFEB is a specialist unit within AFBI which provides a strategic socio-economic modelling, knowledge transfer and decision support service for a wide range of customers in government, NGOs and the private sector, nationally and internationally.

The following sections of the report provide examples of scientific and economic work carried out during the year and have been selected to provide an overview of the nature and extent of the science conducted by AFBI.

#### 2.3 Sustainable food and farming

#### Online crop nutrient recommendation program

Jointly developed by Biometrics' development team and CAFRE technologists, this online program will help farmers decide how best to meet crop requirements. It is available on the Internet at: http://eservices.ruralni.gov.uk/onlineservices/ secure/cropnutrient.asp

Farmers can input data relating to their field, soil, crop and fertilisers.

The program will help users to:

- Calculate the amount of nutrients, nitrogen (N), Phosphate (P205) and potash (K2O) required by crops;
- Calculate the amount of these nutrients, supplied by organic manures and chemical fertilisers;
- Ensure nutrients are not over- or undersupplied to crop requirement;
- Comply with the nutrient limits for the Nitrates Action Programme;
- Provide records for the Nitrates Action Plan with regard to nutrient limits;
- Develop a fertilisation plan if applying for derogation to the Nitrates Action Programme.



#### AFBI variety registration software goes to Serbia

Plant breeding and selection is a lengthy process, often taking up to ten years before a new plant variety is ready for marketing, so creating new varieties can be an expensive process. Plant breeders can recover these costs by registering their new variety and obtaining a grant of Plant Breeders' Rights.

The International Union for the Protection of New Varieties of Plants (UPOV) is the forum for the coordination of the granting of Plant Breeders' Rights across member countries. An AFBI scientist travelled to Serbia to train plant scientists how to use unique AFBI-developed software in their technical examinations of new plant varieties for the awarding of Plant Breeders' Rights.

Some widely-used crops and plant species comprise many bred varieties, these trials can be very extensive, and large amounts of data can be generated which have to be analysed according to specialised protocols in order to be able to determine the distinctness, uniformity and stability of each new variety. The software developed by AFBI has been written specifically for this purpose.



Because of its suitability for use with variety registration trials and particularly as it can be run on a PC, UPOV now recommends the AFBI software and currently 48 countries use the software in their plant variety registration systems.

As global markets open up and genetic engineering techniques advance, there is ever more need for the careful examination and registration of new candidate varieties and the new AFBI software is playing its part in the harmonisation of technical examination methods worldwide.

## Development of CloverCheck – a management decision system for grass/clover swards

The cost of fertilizer nitrogen is anticipated to continue to rise. White clover is a forage legume and is capable of fixing atmospheric nitrogen. When grown with grass it offers the possibility of producing similar amounts of animal product to grass receiving 150 kg N per hectare, particularly in combination with efficient utilisation of animal manures. To encourage the adoption of white clover-based systems CloverCheck, a management aid system is being developed. It will include regular updates on growth and clover content of grass/clover plots and swards on farms and prediction of growth and clover content expected on these swards by a mathematical model. Herbage quality will also be included.

The model is driven mainly by meteorological data, estimates of soil N availability over the growing season and starting grass and clover yields at the beginning of the season. The model will be used to predict mean overall sward growth and clover content for Northern Ireland, and the inputs to the model can be updated as the season progresses.


## Nutrient management planning

Nutrient management planning (NMP) and the responsible

use of organic and inorganic fertilisers (particularly phosphates) is being promoted across Northern Ireland. The Vision NMP project was undertaken by AFBI to provide background scientific information on a representative number (67) of intensive dairy farms to give scientific credibility to NMP and provide a measure of its success. It also led the scientific foundation for DARD's 'Nitrates and Phosphorus Regulations 2007' introduced in Northern Ireland in January 2007 to halt enrichment of Northern Ireland rivers and lakes by agricultural poll by restricting the amount of fertiliser Nitrogen (N) and



of Northern Ireland rivers and lakes by agricultural pollution by restricting the amount of fertiliser Nitrogen (N) and Phosphorus (P) that could be applied to land and by improving nutrient management.

The Project offered farmers soil analyses for 5 silage fields, grass analyses for these 5 silage fields at 3 cuts, digitised farm maps identifying areas where slurries and fertilisers should not be spread, a nutrient management plan and slurry analysis.

Conclusions drawn from soil, slurry and grass analyses included:

- DARD/AFBI recommendations based on herbage and soil analysis were reliable for forage grass production in Northern Ireland.
- Slurry analysis showed that the nutrient contents of slurries provided in the MAFF document 'Fertiliser Recommendations for Agricultural and Horticultural Crops' RB209 (2000) could be used with confidence when calculating crop nutrient requirements in Northern Ireland.



Location of Vision NMP farms

© Crown Copyright and database rights OSNI NIMA ES&LA201.3

- Farmers had been applying too much P to cutting land. Soil reserves of P were still strong for fields at P-index 2 or above. With correct recycling of organic manures, most (85% of) silage fields at soil P index 2 and above needed no P from chemical fertiliser. This was confirmed by grass analysis.
- Most silage fields needed regular sulphur, especially at first cut.
- Around 30% of fields required more K, especially at second cut.
- The number of farmers using Zero-P and S-containing fertilisers increased dramatically (by at least a factor of 3) when NMP was introduced.
- Farmers saw the benefit of keeping records of rates and types of fertilisers and manures applied as this enabled them to keep a check on their nutrient balances throughout the year.



AFBI's PANalytical X-ray Fluorescence Spectrometer

This study has provided data that will reassure participants adopting NMP for the first time that their decisions are based on procedures that are agronomically, scientifically and environmentally sound. In particular, those farmers using Zero-P fertilizer as part of their responsible management of soil and slurry nutrients achieved both economic and environmental benefits while delivering high yielding silage swards of balanced mineral composition.

## Mycobacterium avium subsp. paratuberculosis (Map)

*Mycobacterium avium* subsp. *paratuberculosis* (Map) is the causative agent of ruminant paratuberculosis (Johne's disease), which has become a worldwide problem. There is controversy regarding its zoonotic capacity and potential role in human Crohn's disease.

The food safety authorities advocate a need to minimize its entry into the human food chain. To date, milk and dairy products have received most attention as possible vehicles of transmission from animal to man due to the fact that the microorganism is secreted in bovine milk and furthermore raw milk may become contaminated with faecal material containing high numbers of Map.

Work in AFBI has focused on 3 aspects of Map in relation to food safety and risk management: improvement of detection methods for Map from milk and dairy products, surveillance and survival studies of the bacterium across a range of dairy matrices and the use of novel technologies to enhance the inactivation of Map in the processing of milk.

A unique molecular method has been used in conjunction with traditional culture techniques to screen raw and pasteurized milk within Northern Ireland as part of surveillance contracts for the local dairy industry and for agencies such as the Food Safety Authority Ireland (FSAI) across the island of Ireland. AFBI scientists have also investigated the efficacy of many dairy processes such as pasteurization alone and in conjunction with bactofugation, microfiltration and homogenization to reduce or eliminate Map from retail product. Survival studies on Map during the Cheddar cheese-making process has attested to the resilience of Map, with Map persisting through the manufacturing process and early ripening period. However, AFBI research has demonstrated the lethality of the milk powder production process on Map. Since a number of scientific studies have shown high temperature short time (HTST) pasteurization not to be completely effective for killing Map present in high numbers in raw milk, AFBI has investigated novel technologies which may be used to supplement or replace HTST pasteurization for the elimination of Map from liquid milk. Studies using the High Pressure Processing technology available at AFBI have demonstrated an approximate 1000-fold reduction in Map numbers in milk after pressure treatment. A reduced inactivation of Map has been observed using a UV radiation process where AFBI staff worked in collaboration with a S. African company specializing in this technology. Both technologies are being investigated further as potential adjuncts to the HTST pasteurization process to ensure total inactivation of Map, if present in raw milk, thereby minimizing the risk of transmission of Map to the food chain should Map emerge as a zoonotic agent.

## Phasing out milk quotas in the EU

The EU Commission has announced its intention to abolish milk quotas by 2015.

An AFBI research project, undertaken in conjunction with a UK research consortium and funded by the four UK agricultural administrations has assessed how best the *process* of moving to milk quota abolition by 2015, in the context of trade liberalisation, might be achieved.

Results show that the projected impact of the abolition or phasing out of milk quotas on EU milk production is modest with the expansion of EU milk production likely to be less than 5% under a number of scenarios. In contrast, EU dairy commodity and producer milk prices are projected to fall significantly, for example by 14% under the Commission's "soft-landing" scenario: this is largely attributable, however, to the elimination of export subsidies which contributes about 9% of the price reduction abolishing or allocating additional milk quota a further 3% and reductions in import tariffs a further 2%.

Reducing import tariffs has a relatively modest impact on commodity and producer milk prices as relatively high world prices and 'water' in the tariff rates stem the inflow of imports into the EU market.

While the production impact of abolishing or phasing out milk quotas is limited at the overall EU-25 level, there is likely to be a certain amount of redistribution of milk production across the EU. Poland and Ireland are projected to experience large increases in production, while Italy and France experience smaller increases.

The policy to allocate additional quota from 2008 to member states is confirmed to be an attractive one for the EU as a whole. Only a modest further increase in national quotas looks likely to be sufficient to tap nearly all the potential for milk supply expansion in most member states and ensure a 'soft landing' for the EU dairy industry. For the UK as a whole, milk production is projected to fall. The negative impact on the producer milk price is greatest in Northern Ireland due to the large share of milk which goes into the lower value processing sector. In contrast, the relatively large volume of liquid milk consumption in England and Wales restricts the drop in the producer milk price.

The projected falls in production across the four home countries under milk quota elimination/phasing out scenarios are quite similar. As milk is allocated first to the liquid market, however, the projected reduction in overall milk supply in the UK will tend to have a greater proportionate impact on milk available to the manufacturing sector.

Any extra quota allocated to the UK is likely to remain unfilled and, as in many other member states, the main impact on dairy farmers under the scenario assumptions will be to depress milk prices and reduce production. If the phasing out option, therefore, is to provide a 'soft-landing' for member states such as the UK it may be rational for these countries to argue for relatively small annual increments in quota during the phasing out period to allow more time for adjustment to a more liberal EU-wide competitive environment.

The downward pressure of the policy reform on dairy commodity prices means that consumers will benefit, but the losses in producer rents will be large, and will intensify the pressure for structural change towards larger herds.

Following the abolition/phasing out of milk quotas and further trade liberalisation, EU commodity prices would be more closely linked to world prices. Consequently, EU producers and processors would tend to face more uncertainty due to increased market volatility as a result of external shocks, for example due to poor weather conditions, being transmitted into the EU market.

First case of bovine complex vertebral malformation in Ireland

Complex vertebral malformation (CVM) is a condition of Holstein calves in which affected animals are usually aborted or stillborn. The condition results from a simple recessive genetic defect, indicating that both parents of an affected calf are carriers. In March 2007 CVM was suspected on post-mortem examination of an aborted Holstein foetus submitted to AFBI Stormont. Examination revealed skeletal abnormalities including a shortened neck, fused cervical and thoracic vertebrae, narrowing of the spinal canal, rib abnormalities, and twisted and rotated legs. Subsequent genetic testing at a laboratory in the Netherlands confirmed that both the sire and the dam were heterozygous carriers of the CVM gene and that the foetus was an affected homozygous. The CVM carrier sire was culled and replaced by a bull that did not carry this genetic condition. This was the first recorded case of CVM in Ireland.

## 2.4 Competitiveness in the agri-food industry





Trend in pesticide application (a) treated area (b) quantity applied to arable crops in Northern Ireland 1990-2006

#### Monitoring pesticide usage

Economic pressures increase the need for farmers and growers to make efficient use of pesticides including insecticides, fungicides, herbicides, growth regulators and seed treatments. In addition, increasing concern regarding environmental protection issues has led to a demand for significant reductions in pesticide applications to crops and the development of novel, environmentally acceptable alternatives. In order to understand current trends in pesticide use and develop a sustainable crop protection strategy, it is important that the use of pesticides in Northern Ireland agriculture is regularly monitored.

AFBI's Pesticide Usage Monitoring Group (PUMG) supported by the Biometrics and Information Systems Branch (BISB) have developed a cyclical series of farm surveys that monitor the use of pesticides in a range of agricultural and horticultural crops in Northern Ireland such as arable, grassland, orchard crops and protected vegetable and mushroom crops. AFBI also monitors pesticide usage in animal husbandry, such as ectoparasite control in sheep.

Data from farmers and growers on pesticide usage are analysed and reports are available on the AFBI web site www.afbini.gov.uk.

In 2006, the most recent survey of arable crops in Northern Ireland recorded an overall 15% decrease in the area of arable crops grown since 2004. During this period the total area of pesticide application and the quantity of pesticides applied decreased by 9% and 30% respectively. This is particularly noticeable with fungicides and herbicides, which are now applied at much lower dosage rates.

## Radio-tracking of sheep grazing on hill land

The traditional sheep breed on the hills and uplands in Northern Ireland is the Scottish Blackface (BF) a hardy breed of sheep well-known for its mothering and foraging ability over large, extensive tracts of hill land.

Previous AFBI research showed that introducing other hill sheep breeds can bring about increases in productivity and meat output, however one outcome of this work was the concern that the other breeds (eg Texel, Llyn, Cheviot, Swaledale etc) might not utilise the forage resource available to them. The ultimate consequence of this could be undergrazing which can lead to environmental degradation and result in breach of Cross Compliance directives (under

Single Farm Payment rules) to maintain the environmental quality of upland grazing.

AFBI research, carried out at CAFRE Greenmount's Hill Farm at Glenwherry, used radio-tracking collars placed on Scottish Blackface and Texel x Blackface ewes. The collars operated on a Global Positioning System (GPS) and were programmed to record the position of the ewes every 30 minutes. From 386 GPS points/locations recorded for each ewe over 11 days in August 2007 both ewes travelled similar

distances - showing they are equally prepared to travel in search of food - but the Scottish Blackface covered a much greater area (over 3 times as much) than the Texel.

This important work has implications for the introduction of non-traditional breeds to the hill and the utilisation of hill vegetation. The work will be replicated on a wider scale in 2008.



Glenwherry Hill Farm, showing GPS Points for ewes over an eleven day period. (Texel Scottish Blackface)



#### Launch of AFBI's cattle health scheme

AFBI launched a commercial cattle health scheme in September 2007. The scheme covers 4 of the most common and economically important infectious diseases of cattle in the United Kingdom and Ireland: bovine viral diarrhoea (BVD), infectious bovine rhinotracheitis (IBR), Johne's disease and leptospirosis. The scheme is run as a partnership between herd owners, their veterinary practitioners and AFBI and follows the rules laid down by Cattle Health Certification Standards (CHeCS), a self-regulatory body set up by the cattle industry. Herd owners may test for any or all of the diseases at the same time, with the ultimate goal of certifying their herds as free of infection. The main benefit to participating herds will be improved animal health and welfare, leading to economic benefits. Certified disease-free cattle can also be expected to obtain a premium at sale. Control of these diseases will also facilitate the entry of bulls to stud and help protect access to international markets.

A series of publicity events has been held for farmers and veterinary practitioners to introduce them to the scheme. By summer 2008, the scheme had a membership of 23 herds, some of which are making good progress towards accreditation.



For further information on the AFBI cattle health scheme please contact Dr. David Graham, Agri-Food and Biosciences Institute, Veterinary Sciences Division, Stoney Road, Stormont, Belfast, BT4 3SD.

Phone: +44 (0)28 90535749 or Fax: +44 (0)28 90525787 or email Info@afbini.gov. uk or check our website www.afbini.gov. uk.

## Nicarbazin in poultry meat - questionnaire

AFBI, DARD, the Food Standards Agency (NI) and the major Northern Ireland poultry companies organised a flock questionnaire aimed at identifying "best practice" for the avoidance of residues of nicarbazin in poultry meat. Nicarbazin is widely used in poultry feed to control coccidiosis. It is relatively non-toxic, and decades of use have not led to significant drug resistance. However, residues testing programmes in the UK have consistently shown that, despite considerable efforts by the industry to minimise their occurrence, nicarbazin residues are more likely to

occur in poultry liver above the regulatory action limit than is the case with other coccidiostats. In Northern Ireland, non-compliant results are investigated by DARD, but information on industry "best practice" is not always available.

This questionnaire was carried out in parallel with sampling of birds at slaughter for nicarbazin, and sampling of the last feed fed to the poultry before slaughter. The survey was designed to complement a similar survey carried out in Great Britain.



The Northern Ireland and Great Britain surveys found a low prevalence of non-compliant results, demonstrating near-optimal feed management within the industry. The Northern Ireland survey identified a relationship between the last feed and liver residues, confirming that feed bin management is a key factor in avoiding residues. It also uncovered significant relationships between feed bin age and capacity of the poultry house and the prevalence of residues. Smaller houses and older bins were more likely to produce birds with unacceptable residues. This is probably related to feed line characteristics and throughput and is of considerable interest, at a time of change, within the industry.

The results of this survey will help Northern Ireland producers improve on their already high standard of management of nicarbazin residues in poultrymeat.

#### Retinal imaging in cattle and sheep

Identification and traceability of cattle and their products is extremely important for animal disease control, protection of public health and trade purposes. Conventional identification is based on national databases of unique, approved ear-tags,



recognised internationally as extremely valuable for tracing animal movement and providing assurance to the consumer and regulatory authorities. Conventional identification relies on tracing a device (ear-tag, e-ID ear-tag, bolus or transponder) attached to, or introduced into, an animal. These devices can become separated from the animal thereby compromising identity and traceability, often with significant consequences. In contrast, biometric identification is based on recording unique

and unalterable biological properties of an animal, i.e. biometric identification traces the animal itself rather than a device such as an ear tag. Biometric technologies can be used in support of conventional identification and can be used to inform the re-assignment of queried identity and traceability.

AFBI has developed and evaluated biometric methods for the identification of cattle and sheep, including retinal scanning. It has carried out research on retinal imaging in collaboration with the USA-based company Optibrand® (http://www. optibrand.com), who have designed and produced a unique system for recording, and subsequently verifying, animal identity. This technology enables the rapid on-farm capture of a digital picture of the back of an animal's eye (retina). This image consists of a tree-like branching pattern of blood vessels that is unique to each individual animal - much like a human fingerprint. The hand-held OptiReader camera, used in this process, is linked to a Global Positioning System (GPS), which records uniquely the precise geographical location of the farm on which the images have been recorded. The retinal image and associated animal-level details, including the name of the herd (or flock) owner and individual ear tag number are recorded, encrypted, downloaded and held securely in a central database. The database can then use

Retinal image with unique 'fingerprint' pattern of veins

Optibrand's unique software to rapidly compare retinal images taken on different occasions to verify or refute the identity of animals.

Retinal imaging has the potential for use in cost-effective applications of interest to the agri-food industry, in support

of regulatory policies on the identification, registration and movement of animals, and in anti-fraud measures. The system offers a reliable, secure and permanent method of uniquely identifying cattle. For high value commercial and pedigree animals, this system could be used to preserve identity and insure against the costly consequences of ear tag identity loss and/or animal theft. In conjunction with the Police Service of Northern Ireland (PSNI) and Optibrand®, AFBI is using retinal imaging to register the identity and locations of valuable ewes and lambs in the Glens of Antrim as a method of deterring and detecting animal theft. Implementation of this technology has resulted in much publicity and the award of a PSNI Community Policing Award. The scheme is also an entrant in the UK National Tilley awards that reward innovative methods of crime prevention.

AFBI's retinal imaging technology can support livestock owners and commercial organisations and assist in improving the identification and traceability of animals and food products. For further information, please contact AFBI's traceability unit on (028) 90519424 or by e-mail to: info@ afbini.gov.uk.







## DNA profiling of cattle

AFBI has developed and evaluated DNA profiling for cattle. This technology has the potential for improving the performance of tag-based identification schemes and tracking animal products throughout the production chain. AFBI is now offering DNA testing of cattle on a commercial basis for a range of applications in the agri-food industry. DNA tests can be performed on many different sample types including blood, hair, semen and meat. These tools offer the industry custom traceability solutions which can be tailored to meet industry and stakeholder needs. All AFBI DNA testing is currently certified to the ISO 9001:2000 standard.

DNA sample storage to prevent cattle identity loss: The loss of cattle ear-tags is inconvenient and potentially can have significant and costly consequences. AFBI can now offer a cost-effective solution, where herdowners can have individual animals or whole herds registered on a DNA database which is managed securely by AFBI. Should any registered animals subsequently lose their tags, DNA tests can then be used to confirm their identity. Through this scheme (*IDsure*), herdowners can protect themselves against identity loss and associated commercial losses.



Theft deterrence: AFBI can register unique DNA profiles of cattle and sheep as a deterrent to theft. If animals are stolen and subsequently recovered, the results of this technology could be used to help establish the genuine ownership of the livestock in question.

DNA parentage testing: AFBI offers competitive DNA parentage testing which enables breed societies, co-operatives and individual farmers to confirm the parentage of pedigree or commercial animals.

DNA testing for Freemartinism: A heifer calf born as a twin to a bull is typically a "freemartin" and as such will be infertile. AFBI now offers a rapid and cost-effective DNA-based test which detects freemartinism with 90% certainty and allows the herd-keeper to make informed management decisions without having to wait for the animal to mature sufficiently for veterinary examination or to discover that it is infertile at breeding age.

## Beef eating quality

Collaboration between AFBI, the NI beef industry, the Livestock and Meat Commission and other stakeholders has led to an extensive programme of research being carried out by AFBI to evaluate, adapt and develop an appropriate

and effective Beef Eating Quality Management System for the Northern Ireland beef industry. The project aimed to provide our local industry with the necessary practical information it requires to fine-tune its beef production and processing methods so that consumers can be consistently supplied with beef of excellent eating quality, whether prepared at home, or as a dining-out eating experience. Aspects



such as the effect of breed, gender, age, lairage, processing regime, ageing and cooking method have been investigated. Industry has supplied most of the beef, and ongoing feedback to participating processors has been an integral part of this project.

In total, 8520 Northern Ireland consumers have taken part in consumer taste panels, evaluating nearly 60,000 pieces of grilled or roast beef from more than 250 animals. Charities and groups across NI have assisted with this research. These have included Church groups, Youth centres, Sports clubs, School PTAs, Scout groups and others. While much of the consumer work has been carried out in Belfast, the research team has also been on the road, visiting venues as far apart as Loughgiel in North Antrim and Enniskillen.

The factors affecting eating quality of Northern Ireland's beef have been studied. While most people know that the muscle or cut has a large effect on eating quality, the importance of position within the muscle, hanging method, breed and chill rate are less commonly appreciated. These factors are influenced by each other, which is also important. A wellknown example is the fact that hip hanging can greatly Terry Nolan (Director of Nolan Meats, Australia), and Rod Polkinghorne (Director of Polkinghornes, Australia) pictured with the AFBI team, Linda Farmer, Norman Gault, Bruce Moss and Ernie Tolland

improve tenderness for some muscles, but not others. When the many such "interactions" are considered, the complexity of beef eating quality becomes evident.

AFBI has also evaluated different internationally available systems to predict and improve the eating quality of beef and have provided recommendations to the industry on the basis of their findings.

A workshop, sponsored by DARD, was hosted at Loughry Campus in May 2008 to consider the outcomes of this research and how best this could be implemented to optimise the eating quality of NI beef.



Pictured at the workshop are Graham Furey (President, UFU), David Rutledge (Chief Executive, LMC), Linda Farmer (Head of Food Chemistry, AFBI), Terry Nolan (Director of Nolan Meats, Australia), Rod Polkinghorne (Director of Polkinghorne's, Australia), John Speers (Director of Food Farm and Environmental Policy, DARD).

## Adding value to milk

Modifying the composition of primary commodities such as milk at production level can add value by improving their functional and nutritional properties. Research has shown that the fatty acid composition of cow's milk can be altered by managing the cow's diet. This is important because milk and dairy products make a significant contribution to both the amount of fat and type of fatty acids we consume. The relationship between a high dietary intake of saturated fatty

acids and an increased risk of coronary heart disease is well established. It is also recognised that we consume a lower quantity of omega-3 (*n*-3) essential fatty acids than is optimal for good health. Medical studies have shown however that if we increase our intake of *n*-3 fatty acids and replace those saturated fatty acids that raise blood cholesterol with unsaturated fatty acids we can reduce both total cholesterol and LDL-cholesterol levels and lower our risk of cardiovascular disease.



AFBI research has focused on improving the composition of milk fat through modifying the traditional Northern Ireland dairy cow diet.

During the summer months, when the animals are grazing fresh pasture, approximately one-third of the fatty acids in cow's milk are unsaturated in nature because these fatty acids are derived from highly unsaturated fatty acids in the grass. AFBI studies on perennial rye grass varieties commonly grown in Northern Ireland found that sward management (for example stage of maturity) was responsible for large fluctuations in content of oil and unsaturated fatty acids. Butter produced from summer milk is much softer than that produced in the winter when cows are on silage diets. AFBI scientists are also investigating the possibility of breeding new ryegrass varieties with higher levels of unsaturated fatty acids. There are nutritional benefits for consumers when cows graze fresh grass Apart from feeding fresh grass to increase unsaturated fatty acids in milk, producers can include whole oilseeds such as rapeseed or soyabean in the dairy cow ration. AFBI has shown that supplementation of the diet while cows are grazing with up to 800 g rapeseed oil per day, supplied as whole rapeseed, improved the saturated:unsaturated ratio to almost 50:50.

Milk producers commonly offer additional feedstuffs such as concentrates or conserved forages during the summer months to maintain yield or supplement poor grass quality or quantity AFBI research has established that inclusion of either grass silage or additional concentrates dilutes the supply of unsaturated fatty acids, producing a more saturated milk fat. We now have detailed information to assist formulating diets to increase the proportion of unsaturated fatty acids present in milk.

It is recommended that we consume at least two portions of oily fish per week in order to have an adequate intake of *n*-3 PUFA. Consumption of milk or dairy products containing enhanced levels of *n*-3 PUFA may help us meet our target intake. AFBI has successfully increased the content of alpha-linolenic acid (*n*-3 PUFA) in the milk almost 3-fold by supplementing the diet of dairy cows with protected kibbled linseed.

Current AFBI research is looking at the effect of organic dairy production systems on *n*-3 PUFA and conjugated linoleic acid (CLA) levels in milk. AFBI has demonstrated that the principle of manipulating the animal's diet to alter fatty acid composition may be applied successfully in the production of red meat, poultry and pork. Enhancing the fatty acid composition of primary commodities such as meat and milk may provide a valuable opportunity to improve the nation's diet given the high volume of such foodstuffs we consume.

## Beef calves from the dairy herd - opportunity to reduce costs

Calves sourced from the dairy herd are very important for the local beef industry and have accounted for up to 50% of the beef produced in Northern Ireland. First quality continental breed bull calves cost up to £170 more than Friesian/Holstein bull calves (source LMC, January – February 2008). Is the extra cost justified when the animals are slaughtered? Successful calf rearing plays a key role in efficient beef production. Key components of successful calf rearing systems include provision of adequate levels of nutrition (protein and energy) and provision of suitable housing. Calf rearing is labour intensive and, as less labour is available for calf rearing and individual calf care, this could have implications for calf health and performance.

Relative to Holstein steers, continental cross Holstein steers (Belgian Blue, Charolais, Blonde d'Aquitaine, Limousin and Simmental) demonstrate greater carcass weights (up to 42 kg heavier) and greater killing out percentages (up to 3 percentage units). This potentially produces an increase in

carcass value of up to £165 per animal, with Belgian Blue and Blonde d'Aquitaine crosses producing the largest increases. However, when the higher cost of continental cross calves is taken into consideration, along with rearing and finishing costs, the differential between Holstein and Continental cross steers is significantly reduced. At current prices and costs of production, and assuming Holstein steers are finished at 28 months, and all other breeds at 24



months, the advantage of Blonde d'Aquitaine relative to Holstein steers, in terms of gross margin/total variable costs, was reduced to £19 per animal while Belgian Blue crosses produced a similar margin to Holstein steers.

Traditional British breeds such as Angus and Hereford produce lighter carcasses than Holsteins, but the availability of bonus schemes and lower input costs will have an impact on overall economics. For example, based on current bonus schemes, Angus cross steers would be worth £30 per animal more in terms of carcass value than Holstein steers. However, when total variable costs (purchase price, rearing

The relative performance of Belgian Blue, Aberdeen Angus, Limousin and Holstein bull calves is currently being evaluated at AFBI, Hillsborough

and finishing costs) are considered, Angus and Hereford cross steers produce a lower margin/total variable costs relative to Holstein steers.

These latest costings indicate that continental cross calves are worth more than Holsteins, but in many cases the extra cost of continental cross calves largely offsets the value of



Group feeding calves once per day can reduce labour costs by £1512 for 50-calf rearing system over a 6 week rearing period improved carcass gain and grading.

With increasing herd size and a greater number of part-time farmers, less labour is available on many farms for calf rearing. This could have implications for calf health and immunity, as less time is available to ensure that calves receive adequate colostrum within 12 hours of birth.

Research has been undertaken at AFBI, Hillsborough to evaluate opportunities

to reduce labour inputs and costs associated with rearing beef cross calves. The calves were allocated to two rearing systems:

- Low Labour System calves group housed and fed once per day through a group feeder designed to feed 30 calves as shown in the attached photograph.
- (2) Standard System calves individually bucket fed twice per day.

Calves on the Low Labour System had lower live weight gains relative to those on the Standard System and weighed 10-11 kg less at 3.5 and 9 months of age than those on the Standard system. In monetary terms (for a 50-calf rearing system, weaning calves after 6 weeks), calves were worth £550 less at 9 months of age than those on the Standard system. However when labour inputs are considered, up to two-thirds less time was spent feeding calves on the Low Labour System relative to those on the Standard system. Assuming a labour cost of £12 per hour and a 6 week rearing period, this is equivalent to a reduction in labour cost of £1512 for a 50-calf rearing system over the 6 week period. On this basis the savings in labour costs in the Low Labour System more than compensated for the lower performance and consequently lower value of the animals. Research continues to investigate reasons for poorer growth rates with the Low Labour System, but early results indicate significant cost savings from low labour calf rearing systems.

Calf mortality and morbidity represent a significant cost to the Northern Ireland cattle industry, both in terms of veterinary costs associated with treating affected animals, plus the losses associated with poor performance and death of animals.

Insufficient intake of colostral immunoglobulins in the first 6 hours of birth is one of the main causes of calf health problems in the pre-weaning period. The immune status of calves can be identified by undertaking a Zinc Sulphate Turbidity Test (ZST) on a blood 80 sample taken within 1 week of birth. Ideally 70 calves should have a ZST level greater <u>|</u>6 60 with ZST < 20 than 20 g/l to ensure optimum health and 50 40 survival. In order to achieve this level, it is 30 calves v essential that calves consume 10-15% of 20 their body weight of colostrum in the first 12 10 hours of life (this is equivalent to 4.5 litres 0 2 colostrum per calf). The immune status of 150 bull calves, sourced from 12 dairy farms throughout Northern Ireland and transferred to AFBI, Hillsborough was evaluated in spring 2007. Some 19% of all calves had ZST levels less than 20 g per l.

Results demonstrate that management practices on the farm of origin have a significant effect on immune status, with some farms having a much greater proportion of calves with low ZST levels. The importance of immune status has also been highlighted by animal performance data which demonstrated that calves with ZST levels less than 20 g per I had 7% lower live weight gains from birth to 9 months relative to those with ZST levels greater than 20 g per I. In monetary terms at 9 months of age, cattle with ZST levels less than 20 g per I are worth £23 less than those with higher ZST levels (live weight difference at 9 months is 23 kg and price is £1 per kg).



Effect of farm of origin on proportion of calves with low ZST levels (less than 20 g per l)



Immune status of spring-born Holstein and beef x Holstein bull calves sourced from dairy farms in Northern Ireland

## 2.5 Management and protection of natural resources

## Pesticides in apples and potatoes

Surveys of pesticide residues in food are routinely performed to obtain data that can help provide some estimate of actual human exposure to pesticides in food. Several foods, such as apples, can be harvested and then stored for considerable periods prior to being marketed and consumed. Disease prevention is necessary to allow storage for extended periods without significant deterioration in the quality of the produce. This is generally achieved by a combination of factors including the selection of suitable fruit, selection of appropriate storage conditions and treatment with different pesticides.

AFBI, in collaboration with QUB, was awarded a research grant by the Food Standards Agency to study the effects of food preparation and cooking procedures on the persistence of a range of pesticides in UK apples and potatoes. Samples of dessert and cooking apples at AFBI Loughgall were treated during the growing season or at harvest with a range of pesticides. After storage under normal commercial conditions the apples were analysed for pesticides after a range of treatments.

Preliminary examination of the data indicated that storage had a greater effect on residues of diphenylamine than on those of carbendazim in both apple varieties. Storage time also appeared to exert a greater influence on residues than the different washing procedures. Cooking in general also had a significant effect on reducing residue levels compared with the effect of washing.

Detailed statistical analysis of the results for apples is proceeding as is analysis of pesticides in potatoes.

## Managing Northern Ireland's coastal zone

AFBI research in the coastal zone includes habitat mapping, the deployment of *in situ* instrumentation to monitor water quality and the development of inshore ecosystem models to assess shellfish carrying capacity. It also draws upon AFBI work and other environmental aspects on fish stock assessment and oceanography, reflecting the strategic needs of a wide range of customers inside and outside of Northern Ireland.

The seabed surrounding Northern Ireland is more complex than the landscape in which we live. A combination of geology, tidal flow, variation in salinity and biological production, provide a rich variety of habitat types, each capable of supporting plant and animal life specially adapted to live there.

Marine habitat mapping is a key part of the scientific response to the requirement for the sustainable management of fisheries and aquatic resources within the coastal zone. Conservation requires the assessment of the extent of 'priority' habitats and changes in the extent and distribution of habitats are important indicators of environmental change. Broadscale habitat mapping improves the knowledge base available for environmental impact assessments of new coastal development projects, the identification of good habitat for mariculture and is used to monitor the impacts of trawling.

AFBI is deploying a wide variety of techniques to map Northern Ireland's marine habitat resources, water column features, variations in the complex geology of the seabed and the diversity of plant and animal communities that live there. High resolution acoustic mapping, together with seabed sampling, produces maps of marine habitats. Acoustic ground discrimination software provides information relating to substrate roughness and hardness point data along survey tracks and is used to map the distribution of sediment types. Grab samples, remotely operated underwater vehicles, or ROV's fitted with CCTV cameras, are used to confirm habitat type and can detect smaller scale variation in habitats. These techniques allows the quantification of resources such a seed mussel.

A "state-of-the-art" multi-beam sonar was installed on the AFBI marine research vessel *Corystes* in early 2008, significantly enhancing AFBI's capability in marine resource assessment and is being used to generate high resolution coverage of the sea floor.

AFBI scientists have been playing a key role in an international marine seabed mapping project led by the Joint Council for Nature Conservation (JNCC) entitled 'Development of a framework for Mapping European Seabed Habitats' (MESH). MESH concluded in early 2008 and established a framework for mapping marine habitats by developing international protocols and generating the first



Seed mussel on the seabed near the mouth of Strangford Lough

compiled marine habitat map for north-west Europe. The MESH "Blue Book" published in 2008 has become the guiding text for this area of science.

## Is growth in land-based wealth sustaining part-time farming?

Throughout Europe, small-scale family farm businesses have long been considered the backbone of rural society. The promotion and preservation of family farms has been a core objective of successive Common Agricultural Policy reforms, the rationale extending well beyond economic arguments to embrace concerns such as the fabric of rural society and protection of the countryside. Farmers' organisations have often argued that the future existence of such businesses is almost entirely dependent on agricultural support policies. Small-scale holdings throughout the European Union, however, have shown remarkable resilience in the face of declining real farm incomes and a widening gap between farm and non-farm earnings.

An AFBI research project, based on economic analysis using a dynamic farm household model of a typical small scale beef holding, indicated that the survival of small-scale family farms, generally not big enough to provide full-time employment for one person, is less sensitive to support policies than is commonly suggested. Using data from Northern Ireland, the project examined the extent to which favourable off-farm labour market conditions, coupled with growth in land values, contributed to the observed resilience of small-scale family farms.

It has been argued that the continuation of small-scale family farming is a lifestyle choice; the sustainability of the farms reflecting the perceived benefits from an agricultural way of life, compensating the economic losses incurred. Other evidence has suggested that, where there are off-farm income opportunities, there is a sound economic rationale for farm businesses, operating on a small scale, remaining in farming and highlights the role of wealth maximisation alongside life-style and profit motives.

The analysis showed that farm household behaviour is influenced not just by current farm income but also expected capital asset returns i.e. the observed resilience of smallscale beef and sheep farms may simply reflect farmers pursuing a wealth maximisation objective. Households are benefiting from increasing land values, whilst also enjoying a rural way of life. The presence of off-farm income is





essential, however, to enable households to sustain this strategy in the face of low and volatile farm income. Other factors are also likely to contribute to structural rigidities in agriculture. Farm households typically will have invested significant capital in specialised assets which have limited salvage value if they cease production. This can act as a disincentive to exiting farming as investment costs cannot be fully recovered.

It was found that growth in net worth of an average smallscale beef farm in Northern Ireland has been around 9% per annum over the past 15 years; generated almost entirely by appreciation in land values. This compares very favourably with returns on alternative investment possibilities. Land is also a tangible asset and hence perceived by some investors to be a relatively stable and secure investment involving less risk than alternatives such as equities. Taken alongside the added tax advantages afforded agricultural land, farming can be a relatively efficient means of holding, managing and ultimately transferring wealth.

Concomitant with increased wealth through land ownership, the study confirmed off-farm sources of income and, in particular, income from off-farm employment, of paramount importance in ensuring the sustainability of small farms. Household consumption demands and farm investment cannot be financed from the income generated by a small farm business. The farm household model illustrated the importance of off-farm income removing the pressure from farming income to fund all family consumption needs. Even for younger farm households, small scale part-time farming is sustainable as long as household members can secure offfarm employment that generates sufficient income to cover the major proportion of their on-going consumption.

The capitalisation of agricultural support payments into land values, under successive CAP reforms, may have resulted in farmers being disinclined to sell land, in the expectation of future gains. However, if expectations of further increases start to recede this may influence the rate of farm exits. In addition, the treatment of farm businesses under UK tax regulations, particularly self employed income, inheritance and capital gains tax relief may incentivise small farms to remain in business.

The growing dependence of EU farm households on off-farm sources of income has clear implications for wider regional economic and spatial development policies. The economies of many rural areas operate at the equilibrium of low-skills and low-wages. With employment concentrated in urban centres, people living in rural areas may lose out on new job opportunities because of a lack of training and/or inability to access employment. Although CAP targeting has, in the past, generally focused on the characteristics of the farm holding, recent decoupling of farm support may facilitate a wider range of policy objectives for rural areas, Support for a more diversified rural economy, for example, could be aimed at enhancing quality of life and enhancing human capital formation. This is in line with current 'CAP Health Check' proposals, with the modulation of Single Farm Payments in order to transfer funding into Second Pillar rural development initiatives.

The projection of structural change in agriculture requires an understanding of the complex social and economic motives underlying household behaviour. Past trends illustrate that farming activities on small scale holdings are insensitive to agricultural policy changes and fluctuating commodity prices. Disentangling the causal effects of the specific social and economic factors contributing to this observed inertia is, however, challenging. The project showed that the interplay between increasing land values and wealth management motives are fundamental to explaining future structural change in agriculture. Part-time farming reflects a rational economic choice for many farm households consistent with the maximising of wealth over the long run.

# Optimal beef and sheep production systems in the less favoured areas (LFA)

Almost 70% of all farms in Northern Ireland are located in the LFA. These farms rely heavily on beef cattle and sheep production, and are often managed on a part-time basis along with off-farm employment. Much of the countryside landscape character in the LFA has been created, and is sustained, by agricultural activity. The areas that suffer the greatest physical challenges are most at risk of losing agricultural activity and thus degradation of landscape character.

ABFI research has used representative farm business models to identify optimal beef and sheep production systems in Northern Ireland's LFA. Consideration was given to the full



range of cattle and sheep enterprises that are feasible within the LFA.

A key feature of the models was their ability to examine what profit maximising farm businesses should do in market and policy settings that are outside past experience. This indicated the direction that the sector would take if a particular combination of market and

policy conditions were to be maintained over the long-run. The models were useful, therefore, in helping to develop industry strategy and to this end continue to inform the work of the Northern Ireland Red Meat Industry Task Force.

The farm models indicated that, under current market and policy conditions, a dairy-based beef system (e.g. rearing and finishing Aberdeen Angus cross Holstein-Friesian dropped calves purchased from a dairy herd) is likely to be the most profitable beef enterprise on livestock farms. However, depending on land quality and livestock housing resources, and the market and policy environment, suckler-based beef systems can also feature in the profit-maximising enterprise mix on these farms. Compared to suckler beef production, the dairy bred beef calf has the cost advantage of being essentially a by-product of milk production. However, growth potential and carcass quality are likely to be significantly better in suckler beef systems. The opportunity to gain premiums under various Aberdeen Angus marketing schemes enables Aberdeen Angus systems to compete in terms of profitability with conventional systems involving continental breeds.

The modelling exercise indicated that the optimal sheep system in Northern Ireland's LFA involved the crossing of Scottish Blackface ewes with Leicester rams, to produce replacement ewe lambs for the lowland flocks. This is consistent with the stratified sheep systems traditionally operated in Northern Ireland. If the demand for replacement ewe lambs from lowland farms declines, however, then the viability of these stratified sheep systems is reduced. In that case, there are various arguments for and against the other sheep systems included in the models. Crossing the Blackface ewe with a Texel ram may be marginally better than keeping crossbred ewes and again crossing them with a Texel ram. For the various Blackface systems to be sustainable, however, a proportion of Blackface ewes must be bred to Blackface rams. In terms of finishing systems for store lambs, the most profitable system involves grazing and feeding concentrates.

In general, beef production appears to have some advantages over sheep production where farm families are attempting to maximise total income from available farm resources. Compared to sheep systems, beef systems are generally more capital intensive, but less labour intensive. Therefore, depending on relative prices and resource availabilities, it is often better to replace sheep with cattle and employ the released labour off-farm, than to replace cattle with sheep and invest the released capital off-farm.

## 2.6 Climate change and renewable energy

#### Biomass crops in Northern Ireland

Short rotation coppice (SRC) willow still offers the best potential for growing biomass for production of renewable energy. The introduction of alternative approaches to harvesting and drying has increased opportunities for growing the crop. The standard method of harvesting and chipping with the chip being dried to approximately 15% moisture content on a drying floor, using hot air, produces a high quality and consistent fuel. The alternative method of harvesting is to use the Stemster® harvester which cut whole rods. These can then be stored at the side of the field or preferably on a hard surface. AFBI has shown that the moisture content drops from around 50% in the freshly cut rods to around 25% after six months, especially following dry warm weather. The rods can reabsorb some moisture during wet periods indicating the importance of providing some protection from the rain, for maximum benefit. The harvest interval is critical.



The Stenster<sup>®</sup> Harvester in action.

A three year harvest cycle produces good dry matter yields. However, on productive sites often the stools can become excessively large putting pressure on harvesters, particularly in diverse genotype mixtures. While there may be a small yield penalty it may be good practice to harvest every other year. A large trail conducted by AFBI is comparing two and three-year harvest cycles.

Using SRC willow for the bioremediation of effluents and sludges is an attractive approach to waste management. As part of a collaborative project with Water Research Council and University of Cranfield (partially funded by EU-LIFE) the effectiveness of SRC willow and poplar to treat municipal sewage has been compared. Over two full growing seasons trees have been irrigated using sewage effluent. Soil and ground water were analysed throughout the year, especially for nitrogen and phosphorous. There was no evidence of leakage of either nutrient from the system. During the irrigation period there was significant rise in the electrical conductivity (Ec) of soil water, primarily due to an increase in salinity, which may have long term sustainability implications. The Ec dropped during the winter when no effluent was applied. If energy crops are being considered for treatment of effluents it is essential to consider the site characteristics. Soils which are too sandy will have insufficient retention time. At the AFBI site there were issues with surface flooding and possible runoff, particularly in the poplar plots. SRC willow appeared to be able to treat much higher volumes with no negative impacts.



Miscanthus (elephant grass) trials underway at AFBI Loughgall

AFBI is investigating other potential biomass crops which may be grown in Northern Ireland conditions. The most promising of these is miscanthus (elephant grass). This fast growing grass can produce very high dry matter yields which can be harvested annually. One of the biggest problems with miscanthus is establishment. Two years of field trials have shown how establishment of the crop can be achieved more reliably and how the growth of miscanthus can be accelerated during the first few seasons of growth. Miscanthus can be chipped and used to produce pellets, although it has quite different properties as a fuel from willow biomass.

## 2.7 Scientific preparedness for emergencies

## Bluetongue vectors: a Northern Ireland perspective Several notifiable animal diseases are vectored by arthropods. These include: African horse sickness, African swine fever,



Onderstepoort suction-light trap and (inset) adult female Culicoides spp. bluetongue, epizootic haemorrhagic disease, epizootic lymphangitis, equine infectious anaemia, equine viral encephalomyelitis, lyme borreliosis, lumpy skin disease and Rift Valley Fever.

Little is known about arthropod-vectors of animal diseases in Northern Ireland and species lists are often outdated. For example, the last dedicated survey for mosquitoes in Belfast was in 1937.

Bluetongue is an insect-borne viral disease to which all species of ruminants are susceptible. This disease is transmitted by a small number of species of biting midges from the genus *Culicoides*. To determine the potential for bluetongue disease to occur in Northern Ireland, and develop mitigating procedures, it is crucial to have a better understanding of the abundance, distribution and the biology of the potential insect vectors.

AFBI has initiated research to provide much-needed baseline data about the presence, prevalence and significance of insect-vectors of statutory animal diseases, in particular the viral disease bluetongue. This project is to prepare for a potential outbreak of bluetongue but will also provide a template for other insect-vectored diseases.

The activity of bluetongue vectors (*Culicoides* spp.) was monitored at 12 sites in Northern Ireland using Onderstepoort suction-light traps.

A maximum of 8,884 adult *Culicoides* spp. was recorded at one site during a single evening trapping period. Representative species from Obsoletus and Pulicaris complexes were found at all sites, including *C. chiopterus*, *C. dewulfi*, *C. obsoletus*, *C. scoticus* and *C. pulicaris*. Adult midge activity declined throughout the latter part of the year and a bluetongue vector-free period was declared in late December 2007.

## Bluetongue testing

Bluetongue represents the most immediate epizootic disease threat to Northern Ireland. The countries and regions of northern Europe where animal movement is restricted because of bluetongue virus serotype 8 (BTV-8) infection have increased in area in 2007-2008, and, at the time of writing, include most of England and Wales. In addition, serotype 1 (BTV-1) has extended its range northwards from Spain into southern France in the same time period.

Regions which remain free of infection are required to carry out surveillance to verify that statu and the sampling and testing exercise required of Northern Ireland was completed during February and March 2008. A total of over 2,600 samples from



657 herds were tested in AFBI using an ELISA which detects antibodies to all 24 serotypes of bluetongue virus. The results of all tests were negative.

The movement of animals from bluetongue restricted zones is permitted under certain conditions, and there have been significant numbers of importations of both cattle and sheep to Northern Ireland. The imported animals must be isolated and then tested 30 days later. In 2007-2008, AFBI, Stormont carried out 7,500 serology tests by ELISA and 2,100 RT-PCR (reverse transcriptase-polymerase chain reaction) tests for the presence of the virus in samples taken from recently imported animals. It was as a result of this post-import testing that, in early 2008, AFBI discovered the first bluetongue-infected animal in Northern Ireland. A consignment of pregnant heifers from The Netherlands was tested post-import in January. A total of 8 were found to be seropositive, indicating previous infection. Following further testing 30 days later, it was found that calves born to two of the seropositive animals were viraemic, and there was also evidence that infection had spread to two other, previously seronegative heifers. This was the first evidence of transplacental infection by BTV-8, and the findings resulted in a change to EU legislation governing the movement of animals from restricted zones, which had not previously accounted for this possibility. In addition, the investigation of the incident gave rise to the first evidence of horizontal transmission of BTV-8 in the absence of the insect vector, although this possibility needs to be validated by further work.



The finding of bluetongue virus in animals in Northern Ireland did not affect diseasefree status because it was detected in imported animals and there was no onward transmission. This was verified through a further serological surveillance exercise on neighbouring farms in which 4,500 tests were carried out with no positive results found. The bluetonguefree status of the island of Ireland was therefore preserved.

#### Avian influenza

As a result of continuing world wide outbreaks of highly pathogenic avian influenza (HPAI) caused by the Asian lineage of H5N1, AFBI carried out enhanced surveillance and early detection programme in 2007. This programme was part of EU-wide exercise which required surveillance of domestic poultry and wild birds. Active surveillance of wild birds was carried out in targeted species of migratory waterfowl from selected regions of Northern Ireland, as wild birds are believed to have a role in the spread of avian influenza.

The results of surveillance throughout 2007 indicated that there was no evidence of avian influenza infection in domestic poultry in Northern Ireland. In migratory waterfowl, several low pathogenicity avian influenza viruses were identified. These included 4 isolates of H3N8 in mallard and teal, two isolates of H4N6 in mallard and teal and one isolate of H9N1 in teal. Two low pathogenic subtypes of H5 were identified from a mute swan and a pintail, but no HPAI of subtypes H5 or H7 virus were found during the surveillance. Additionally, as an incidental finding, three isolates of avian paramyxovirus (PMV 4) were identified from mallard and teal.

It is normal for wild birds to carry low pathogenic avian influenza and paramyxoviruses and the results of AFBI's surveillance are consistent with the findings of other EU member states.



## 2.8 Events and Visits

#### Minister's visit to AFBI Stormont

The Minister of Agriculture and Rural Development, Michelle Gildernew MP MLA, visited AFBI Stormont in February 2008 to thank staff for their rapid and successful investigation, following the importation of bluetongue-infected cattle to a North Antrim farm in January 2008. AFBI's rapid provision of testing and scientific advice to support DARD's effective action in containing and eliminating infection from the farm, demonstrates the value of maintaining a local laboratory emergency response capability for epizootic diseases.


## Farm woodland forum

AFBI hosted the International farm woodland forum meeting with the theme *"Trees for Farm and Community - Post Decoupling"*.

Highlight of the programme was a visit to the silvopastoral site at AFBI Loughgall where the ash trees had performed well while growing in pasture grazed by sheep and cattle or growing in rows in a barley crop. A high value crop of hurley stick ash has been harvested 15 years after planting and for the first 13 years of the tree-pasture system, sheep carrying capacity was not reduced at all by the presence of the trees at 5 metre by 5 metre spacings.

The visitors were highly impressed by the AFBI Loughgall site – and commented on how this was a good example of improving the outputs from grassland, enhancing the environment and offering farmers a real, viable sustainable land use option at the same time. The site and quality of the stock and trees was highlighted as an example of best – practice across the UK.



Dr Jim McAdam, AFBI, explains the finer points of the Loughgall silvopastoral trials to the Farm Woodland Forum delegates.

# Agri-Food and Biosciences Institute – Annual Report 2007-2008



Dr Jim McAdam, AFBI, (left) shows some of the legume species grown in Chilean soil at the controlled environment facility to the Chilean Secretary of State for Mining, Ms Karen Poniachik (centre) and the Ambassador of Chile to the Court of St James, His Excellency Professor Rafael.

#### Chilean Ambassador

AFBI was delighted to receive a delegation from Chile to their Belfast headquarters.

The Ambassador of Chile to the Court of St James, His Excellency Professor Rafael Moreno and the Chilean Secretary of State for Mining, Ms Karen Poniachik, accompanied by Lord Ballyedmond, (Hon. Consul for Chile in Northern Ireland), were formally welcomed to the Institute by Prof David McDowell, Vice Chair of

the AFBI Board and senior AFBI staff were in attendance.

AFBI provided information on its links with the University of Magallanes in Southern Chile where it supervised two PhD students working in agro-forestry and ongoing legume/ nitrogen fixation research. Both these projects are of benefit locally as some of the fieldwork has been carried out in Northern Ireland and Chile.

His Excellency Professor Rafael Moreno, with a University background in Rural Development, was very interested in the work AFBI is engaged in and discussed some areas where the Chilean Government may wish to avail of AFBI's expertise.

Chile is the largest producer of farmed salmon in the world and Ms Karen Poniachik, Secretary of State for Mining, was keen to hear about the areas of work AFBI undertake in salmon research, forestry (which accounts for 34% of Chilean exports) and animal health (for their developing livestock sector). AFBI's work in Renewable Energy, especially biomass, was of great interest as the Chilean Government is hoping to develop biomass production in the south of the country.

The Ambassador and his party were taken to the controlled environment facility at AFBI Headquarters to experience, first hand, research in different legume species that are being grown in Chilean soil and in acid, peaty soil from Northern Ireland, sourced from CAFRE-Glenwherry, to try and improve their capacity to fix atmospheric nitrogen for the benefit of grass-based livestock production in both countries.

## Plant nematology workshop

Agronomists from as far afield as Canada, Portugal and Sweden joined colleagues from the British Isles to attend a specialist workshop in AFBI in September 2007 on the diagnosis and management of nematode pests. These microscopic worms are of increasing economic importance throughout the world, where they attack virtually all agricultural and horticultural crops.

Part of the Workshop was devoted to nematode pests of amenity turf grasses and attracted delegates involved in the management of many Premiership football pitches in England and most of the top golf courses within Europe.

The main focus of the workshop was nematode pests of the potato crop. For over sixty years Northern Ireland has led the world in the management of potato cyst nematodes (eelworms) and maintains a high reputation for the production of healthy seed potatoes. Increased trade and recent climatic

change has resulted in both the spread of existing pests and the emergence of previously unknown nematodes in North America and Europe. Delegates were trained by AFBI specialists in a range of skills, which can then be applied to commercial crop production in their own regions.

The workshop has been organised under the auspices of the Association of Applied Biologists, with sponsorship from the Department of Education and Learning (Northern Ireland) and Syngenta.





# Agri-Food and Biosciences Institute – Annual Report 2007-2008

#### Minister's visit to Corystes

The Minister for Agriculture and Rural Development, Michelle Gildernew MP MLA, visited the RV Corystes, AFBI's marine research vessel.

During her visit the Minister met with fishing representatives, the Tri-Council Group in fisheries, her fishery Ministerial colleagues from England, Scotland, Wales, Commissioner Borg and the Assembly Committee.



The Minister was also able to meet AFBI scientific staff and see at first hand, how the integrated science programme delivered by AFBI directly supports the key policy objective of DARD in the sustainability of Irish Sea fisheries.

The comprehensive data on fish stocks and the marine environment provided by Corystes are also allowing AFBI to investigate how climate change can impact ecosystem processes and through this fish stocks.

Agriculture Minister Michelle Gildernew pictured with Dr Stephen Beggs showing a fish sample onboard the RV Corystes.

# Agri-Food and Biosciences Institute – Annual Report 2007-2008

## CARAS visit to AFBI Loughgall

Members of CARAS visited AFBI Loughgall on 14 August 2007 and were given a tour of the research programme on potato breeding, mushrooms, fruit, grass breeding, renewable energy and agroforestry. Members saw some of the ongoing work and how it looks set to influence the shape of the local farming sector in coming years.



#### Training visits to AFBI Stormont

Training visits to AFBI Stormont swine virology group within the EC funded projects welcomed young scientists from Bulgaria, Cyprus, Canada, Latvia, Macedonia and Sweden. David Johnston (left), AFBI Loughgall, updates members of CARAS on the grass breeding programme.

The main objective of the training program under the EU project NMSACC-PCVD 518432 is to transfer diagnostic techniques for classical virology techniques, immunological methods, histopathology and molecular biology methods. All diagnostic techniques are conducted in accordance with the Standard Operating Procedures established by AFBI's staff.



I. ly Dxy

Dr George McIlroy Chief Executive and Accounting Officer Date: 2/12/08

Section 3 Statement of Accounts

# 3.1 Remuneration Report

#### **Chairman and Board Members**

The Chairman and Board members are appointed for a fixed period of three years. Thereafter they are re-appointed in accordance with the Code of practice.

The remuneration of the Board is set by DARD. Increases are calculated in line with the recommendations of the Senior Salaries Review Body. There are no arrangements in place for the payment of a bonus. Neither the Chairman nor any Board Member receives pension contribution from AFBI or DARD. AFBI reimburses the Chairman and Board members for any incidental expenses incurred for carrying out their duties relevant to the organisation.

## Details of remuneration of the Chairman and Board Members

In 2007/2008, the remuneration of the members of the Board was increased by 2%; their revised salaries are shown below.

	2007/08		2006/07	
	Salary	Benefits	Salary	Benefit
		in kind		in kind
	(to nearest	(to nearest	(to nearest	(to nearest
	£1,000)	£100)	£1,000)	£100)
Mr Sean Hogan, Chairman	24	-	24	-
Prof. David McDowell	10	-	10	-
Mr Kieran Campbell	4	-	4	-
Dr Michael Hollywood	4	-	4	-
Dr Christine Kennedy	4	-	4	-
Mr Nicholas Mack	4	-	4	-
Prof. Grace Mulcahy	4	-	4	-
Mr John McKinley	4	-	4	-
Prof. Stewart McNulty	4	-	4	-
Mr Jim Noble	4	-	4	-
Mr John Rankin	4	-	4	-
Mr Michael Walker	4	-	4	-
Mr Jim Stewart			4	-
Mr Jim Stewart resigned on 3	31 March 2007			

The following members completed their term of office on 31 March 2008, but as they are eligible for re-appointment, the DARD Minister announced that their term of office had been extended to 31 March 2010 effective from 1 April 2008.

Dr Christine Kennedy Dr Michael Hollywood Mr Kieran Campbell Mr John McKinley Mr Nicholas Mack

## Sub-committees of the Board

The following sub-committees continued to operate during the year:

## Audit Committee

Dr Michael Hollywood, Chairman Mr Kieran Campbell Mr John Rankin

## **Remuneration Committee**

Prof. David McDowell, Chairman Mr Kieran Campbell Dr Christine Kennedy

The role of the Remuneration Committee is to advise the AFBI Board in respect of members of the Senior Management Team (SMT). Whilst the terms and conditions of employment and remuneration of all AFBI employees are in accordance with the overall terms and conditions of the NICS, as described above, any proposed changes to the overall framework are also subject to review and scrutiny by this Committee.

## Policy on Rewards to Staff for Exploitation of Intellectual Property

The Remuneration Committee reviewed the organisation's procedures for rewarding staff where their work gave rise to increased income from the exploitation of intellectual rights. A policy on rewards to staff, approved by the AFBI Board, was issued to DARD.

# Chief Executive and Senior Management Team

#### **Remuneration Policy**

At present, the remuneration of the Chief Executive Officer and the three Deputy Chief Executive Officers is set in accordance with the Senior Civil Service (SCS) in Northern Ireland which, in turn, is set by the Prime Minister following independent advice from the Review Body on Senior Salaries. The pay award for staff in the Senior Civil Service is comprised of two elements; a base pay uplift and a non-consolidated bonus, both of which are entirely performance based.

At present, the remuneration of the Head of the Business Support Unit and the Head of the Chief Executive's Support, the remaining members of the senior executive team in AFBI called the Senior Management Team (SMT), is set in accordance with the pay award negotiated with the trade unions for all non-industrial staff in the Northern Ireland Civil Service.

#### Service contracts

Appointments in AFBI are made in accordance with the Civil Service Commissioners code which requires appointments to be made on merit on the basis of fair and open competition but also includes the circumstances when appointments may otherwise be made. Unless otherwise stated below, the officials covered by this report hold appointments which are open-ended until they reach the normal retiring age of 60. Policy relating to notice periods and termination payments is contained in the Northern Ireland Civil Service (NICS) Staff Handbook.

#### Duration of notice periods

At present, recruits or promotees to the analogous Senior Civil Service posts in AFBI are required to give three months notice of resignation. The Institute reserves the right to introduce a longer period of notice for individual posts up to a maximum of six months and incumbents will be notified accordingly. This may be likely where the recruitment of the replacement is likely to be a protracted process.

At the time of resignation, the Institute may, by agreement with the member of staff concerned, agree to waive the required notice.

Where the Institute is of the opinion that the appointee is unfit to continue in post or is incapable of adequately performing the duties of the post, it can terminate the appointment with due notice as per the NICS Staff Handbook/Terms and Conditions.

#### **Termination payments**

If for any reason other than disciplinary dismissal, the minimum period of notice cannot be given, the member of staff will receive compensation in lieu of the unexpired period of notice. Compensation is not payable when the date of leaving is mutually agreed, for example, in cases of flexible early retirement, approved early retirement, voluntary redundancy or where staff resigns before the end of the notice period.

## **Salary and Pension Entitlements**

The following sections provide details of the remuneration and pension interests of the Senior Management Team of the Institute.

#### (a) Remuneration

	2007/08		2006/07	
	Salary Benefits in kind		Salary	Benefit in kind
	(to nearest	(to nearest	(to nearest	(to nearest
	£1,000)	£100)	£1,000)	£100)
Dr S G McIlroy	80 - 85	-	85 - 90	-
Dr M Camlin	65 - 70	-	65 - 70	-
Dr S Neill	65 - 70	-	65 - 70	-
Dr S Kennedy	60 - 65	-	60 - 65	-
Dr R Boyd	60 - 65	-	60 - 65	-
Mr S Dolan	50 - 55	-	50 - 55	-

#### Salary

Salary includes gross salary; performance pay or bonuses and any allowance that is subject to UK taxation. This report is based on payments made by the Institute and thus recorded in the accounts.

#### Benefits in kind

The monetary value of benefits in kind covers any benefits provided by the employer and treated by HMRC as a taxable emolument.

## (b) Pensions

Name	Real increase in pension	Real increase in lump sum	Pension at end date	Lump sum at end date	CETV at start date	CETV at end date	Employee contribs. and transfers in	Real increase in CETV funded by employer
To nearest £			To ne £'0	arest 00	To nearest £	To nearest £'000		
Dr G Mcllroy	0-2500	0-2500	15000-20000	50000-55000	333	364	1229	24
Dr M Camlin	0-2500	0-2500	30000-35000	90000-95000	797	811	992	50
Dr S Neill	0-2500	0-2500	30000-35000	100000-105000	786	857	5749	3
Dr S Kennedy	0-2500	0-2500	20000-25000	65000-70000	420	450	970	0
Dr R Boyd	0-2500	0-2500	20000-25000	70000-75000	516	576	911	7
Mr S Dolan	0-2500	0-2500	10000-15000	40000-45000	76	294	784	14

## **Cash Equivalent Transfer Values**

A Cash Equivalent Transfer Value is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the members accrued benefits and any contingent spouses pension payable from the scheme. A CETV is a payment made by a pension scheme or arrangement when a member leaves a scheme and chooses to transfer the benefits accrued in their former scheme. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their total membership of the pension scheme, not just their service in a senior capacity to which disclosure applies. The CETV figures include the value of any pension benefit in another scheme or arrangement which the individual has transferred to the Civil Service pension arrangements. They also include any additional pension benefit accrued to the member as a result of their purchasing additional years of pension service in the scheme at their own cost.

CETVs are calculated within the guidelines and framework prescribed by the Institute and Faculty of Actuaries.

Due to certain factors being incorrect in the 2006/07 CETV calculator there may be a slight difference between CETV figures as at 31 March 2007 stated above and the figures at 31 March 2007 used in the calculation of the CETV at 31 March 2008.

## Real increase in CETV

This reflects the increase in CETV effectively funded by the employer. It does not include the increase in accrued pension due to inflation, contributions paid by the employee (including the value of any benefits transferred from another pension scheme or arrangement) and uses common market valuation factors for the start and end of the period.

## **Civil Service Pensions**

Pension benefits are provided through the Northern Ireland Civil Service pension arrangements which are administered by Civil Service Pensions (CSP). Staff in post prior to 30 July 2007 may be in one of three statutory based 'final salary' defined benefit arrangements (classic, premium, and classic plus). These arrangements are unfunded with the cost of benefits met by monies voted by Parliament each year. Pensions payable under classic, premium, and classic plus are increased annually in line with changes in the Retail Prices Index. New entrants joining on or after 1 October 2002 and before 30 July 2007 could choose between membership of premium or joining a good quality 'money purchase' stakeholder arrangement with a significant employer contribution (partnership pension account). New entrants joining on or after 30 July 2007 are eligible for membership of the nuvos arrangement or they can opt for a partnership pension account. Nuvos is an 'earned pension' arrangement in which members accrue pension benefits at a percentage rate of annual pensionable earnings throughout the period of scheme membership. The current rate is 2.3%. Earned pension benefits are increased annually in line with increases in the RPI and attract annual pension increase.

Employee contributions are set at the rate of 1.5% of pensionable earnings for classic and 3.5% for premium, classic plus and nuvos. Benefits in classic accrue at the rate of 1/80th of pensionable salary for each year of service. In addition, a lump sum equivalent to three years' pension is payable on retirement. For premium, benefits accrue at the rate of 1/60th of final pensionable earnings for each year of service. Unlike classic, there is no automatic lump sum (but members may give up (commute) some of their pension to provide a lump sum). Classic plus is essentially a variation of premium, but with benefits in respect of service before 1 October 2002 calculated broadly as per classic.

The partnership pension account is a stakeholder pension arrangement. The employer makes a basic contribution of between 3% and 12.5% (depending on the age of the member) into a stakeholder pension product chosen by the employee. The employee does not have to contribute but where they do make contributions, the employer will match these up to a limit of 3% of pensionable salary (in addition to the employer's basic contribution). Employers also contribute a further 0.8% of pensionable salary to cover the cost of centrally-provided risk benefit cover (death in service and ill health retirement).

The accrued pension quoted is the pension the member is entitled to receive when they reach pension age, or immediately on ceasing to be an active member of the scheme if they are at or over pension age. Pension age is 60 for members of classic, premium, and classic plus and 65 for members of nuvos.

Further details about the Civil Service pension arrangements can be found at the website www.civilservicepensions-ni.gov.uk.

The Institute's accounting policy in respect of pensions is at Note 1 to the accounts.

Dr George Mckroy Chief Executive and Accounting Officer

Date: 2/12/08 ••• 83 •••

# 3.2 Statement on Internal Control

## Scope of responsibility

As Accounting Officer, I have responsibility for maintaining a sound system of internal control that supports the achievement of AFBI's policies, aims and objectives, set by the Institute's Minister, whilst safeguarding the public funds and the Institute's assets for which I am personally responsible, in accordance with the responsibilities assigned to me in Government Accounting Northern Ireland.

The accountability arrangements within AFBI encompass stewardship, performance and compliance. Monthly Management team and AFBI Board meetings with quarterly Audit Committee meetings support the role of the Accounting Officer.

## The purpose of the system of internal control

The system of internal control is designed to manage risk to a reasonable level rather than completely to eliminate all risk of failure to achieve policies, aims and objectives; it can therefore only provide reasonable and not absolute assurance of effectiveness.

The system of internal control is based on an ongoing process designed

- to identify the principal risks to the achievement of Institute policies, aims and objectives;
- to evaluate the likelihood of these risks being realised;
- to assess the potential impact of these risks; and
- to manage them efficiently, effectively and economically.

This process has been in place for the year ended 31 March 2008 and up to the date of approval of the annual report and accounts, and accords with Department of Finance and Personnel guidance.

## Capacity to handle risk

AFBI aims to manage risks at the lowest level at which they are controllable. To this end, the institute has completed a review and revision of its Risk Management Strategy and introduced an improved process for managing risk. Appropriate procedures are in place to ensure that the Institute has identified its objectives and risks and determined a control strategy for each of the significant risks. Risk ownership has been allocated to the appropriate staff, and the Institute has set out its attitude to risk to the achievement of the Institute's objectives. The Management Team has ensured that procedures are in place for verifying that aspects of risk management and internal control are regularly reviewed and reported on, and that these activities are appropriately linked into corporate planning and decision making processes. AFBI Internal Audit reviewed risk and control assessment procedures within AFBI before reporting on the year ending 31 March 2008. The AFBI non-executive Board receives monthly exception reports of new risks or significant changes to existing risks. The Audit and Risk Committee receives and reviews the corporate risk register four times a year. Appropriate steps are being taken to manage risks in significant areas of responsibility and monitor progress on key projects. Risk management and reporting processes were further enhanced during the year, and on-going training was provided in this activity for all relevant AFBI managers.

#### The risk and control framework

AFBI Internal Auditor's operate to standards defined in the Government Internal Audit Manual. Annually, the Head of Internal Audit (HIA) provides me with a report on internal audit activity in the Institute. The report includes the HIA's independent opinion on the adequacy and effectiveness of the Institute's system of internal control with recommendations for improvement. AFBI has also documented its Risk Management Strategy. This document describes at a high level how AFBI will implement its approach to risk management. It sets out the necessary organisation roles and responsibilities, along with a framework of underlying principles of the control system. This Strategy document has been made available to all the managers within the organisation to make them aware of their responsibilities in relation to risk management.

AFBI inherited corporate Risk Registers from its legacy organisations on its inception. The relevant risks recorded in these registers were combined in a new register and these are reviewed and revised as dictated by the priorities in each year. The generic areas which are reviewed include funding, procurement, human resource and operational issues. The format of the register is also reviewed and, when necessary, changes are made for more comprehensive and better presentation. In order to ensure the proper management of risk, a risk coordinator has been appointed charged with co-ordinating the work involved and with the maintenance of the register. A key component of the management of risk within AFBI is the role of the Deputy Chief Executive Officers. They hold regular meetings with their divisional management teams to review and assess risk management within the Division and any material changes to the status of any risk is brought to the attention of the Senior Management Team at their monthly meetings, and brought to the attention of the AFBI Audit Committee and ultimately the AFBI Board. The Corporate Risk Register is a standing item at the Senior Management Team Meetings and the AFBI Board meetings.

The business planning process and more specific project planning processes take account of risks to the achievement of objectives and these risks are recorded in the appropriate risk register with mitigating and additional management actions allocated to a responsible officer. Each of the Divisional Heads prepares a stewardship statement providing assurances to the CEO in support of the Statement on Internal Control. These statements give assurances that the necessary controls are in place in each of the business divisions.

#### **Review of Effectiveness**

As Accounting Officer, I have responsibility for reviewing the effectiveness of the system of internal control. My review of the effectiveness of the system of internal control is informed by the work of the internal auditors, the executive managers within the Institute who have responsibility for the development and maintenance of the internal control framework, and comments made by the external auditors in their management letter. I have been advised on the implications of the result of my review of the effectiveness of the system of internal control by the Management Board and by the Audit and Risk Management Committee and a plan to address weaknesses and ensure continuous improvement of the system is in place.

The HIA has provided me with a report on internal audit activity within the Institute during the year and an annual assurance statement. These indicate that that whilst overall there is a basically sound system of governance, risk management and internal control in place, there are areas for improvement in relation to, management of research projects with QUB, the nominal ledger, Asset management, Account NI procurement arrangements, Sick Absence management arrangements under the HRConnect contract and the roll out of a register of interests with the specific areas of significant internal control highlighted below. The HIA states that her opinion is based upon both the direct audit work performed in 2007-2008 and an evaluation of the adequacy of the Institute's risk management process.

#### Internal control improvements

During the period the HIA identified the following specific areas where internal control could be further improved:

- Management of QUB-AFBI joint research contracts; specifically a requirement for more complete and accurate management information from QUB research office and more timely payments of outstanding balances.
- Management of the nominal ledger to include additional reconciliation and a review of DARD legacy account to assist clearer presentation of budgetary information.
- Asset Management; specifically completion of the review of AFBI's assets and a revision of the asset management procedures to reflect AFBI's status as an NDPB.
- Account NI procurement arrangements; AFBI requires clarification of Account NI's procurement procedures and processes to provide assurances to AFBI management that contract details will be available.

I assigned responsible officers to prepare action plans and associated timetables to rectify these weaknesses. The implementation timetables are monitored by the Chief Executive's Office, subject to follow up reviews by Internal Audit and reported through SMT to the Audit and Risk Committee. I am pleased to report that an Internal Audit Follow up report identified that progress was being made against a range of the audit recommendations. All the agreed recommendations will be implemented in the course of the coming year.

l. g.

Dr George Mcl<sup>1</sup>roy, Chief Executive and Accounting Officer

log Date: 2/12

# 3.3 Statement of Accounting Officer's Responsibilities

Under the Agriculture (Northern Ireland) Order 2004, the Institute is required to prepare for each financial year, a statement of accounts detailing the resources acquired, held, or disposed off during the year and the use of resources by the Institute during the year.

The statement of accounts is prepared on an accruals basis and must give a true and fair view of the state of affairs of the Institute, its income and expenditure, recognised gains and losses and cash flows for the financial year.

DARD has appointed the Chief Executive Officer of the Institute as Accounting Officer of the Institute, with responsibility for preparing the Institute's accounts and for transmitting them to the Comptroller and Auditor General.

In preparing the accounts, the Accounting Officer is required to comply with the Government Financial Reporting Manual and in particular to:

- a) observe the Accounts Direction issued by DARD, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;
- b) make judgments and estimates on a suitable basis;
- c) state whether applicable accounting standards, as set out in the Government Financial Reporting Manual have been followed, and disclose and explain any material departures in the accounts; and
- d) prepare the accounts on a going concern basis.

The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which he is answerable, for keeping proper records and for guarding the Institute's assets, are set out in the Accounting Officer's memorandum issued by DFP and published in Government Accounting Northern Ireland.

# 3.4 Audit Certificate

## Agri-Food and Biosciences Institute

# THE CERTIFICATE AND REPORT OF THE COMPTROLLER AND AUDITOR GENERAL TO THE NORTHERN IRELAND ASSEMBLY

I certify that I have audited the financial statements of the Agri-Food and Biosciences Institute for the year ended 31st March 2008 under the Agriculture (Northern Ireland) Order 2004. These comprise the Income and Expenditure Account, the Balance Sheet, the Cashflow Statement and Statement of Recognised Gains and Losses and related notes. These financial statements have been prepared under the accounting policies set out within them. I have also audited the information in the Remuneration Report that is described in that report as having been audited.

#### Respective responsibilities of the Agency, Chief Executive and Auditor

The Institute and Chief Executive as Accounting Officer are responsible for preparing the Annual Report, the Remuneration Report and the financial statements in accordance with the Agriculture (Northern Ireland) Order 2004 and the Department of Agriculture and Rural Development's directions made thereunder and for ensuring the regularity of financial transactions. These responsibilities are set out in the Statement of Agency's and Chief Executive's Responsibilities.

My responsibility is to audit the financial statements and the part of the remuneration report to be audited in accordance with relevant legal and regulatory requirements, and with International Standards on Auditing (UK and Ireland).

I report to you my opinion as to whether the financial statements give a true and fair view and whether the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Agriculture (Northern Ireland) Order 2004 and the Department of Agriculture and Rural Development's directions made thereunder. I report to you whether, in my opinion, the information which comprises the Management Commentary, AFBI Science and the unaudited part of the Remuneration Report included in the Annual Report is consistent with the financial statements. I also report whether in all material respects the expenditure and income have been applied to the purposes intended by the Assembly and the financial transactions conform to the authorities which govern them.

In addition, I report to you if the Institute has not kept proper accounting records, if I have not received all the information and explanations I require for my audit, or if information specified by the Department of Finance and Personnel regarding remuneration and other transactions is not disclosed.

I review whether the Statement on Internal Control reflects the Institute's compliance with the Department of Finance and Personnel's guidance, and I report if it does not. I am not required to consider whether this statement covers all risks and controls, or form an opinion on the effectiveness of the Institute's corporate governance procedures or its risk and control procedures.

I read the other information contained in the Annual Report and consider whether it is consistent with the audited financial statements. The other information comprises the Foreward from the Chair and the Chief Executive's report. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements. My responsibilities do not extend to any other information.

#### Basis of audit opinions

I conducted my audit in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board. My audit includes examination, on a test basis, of evidence relevant to the amounts, disclosures and regularity of financial transactions included in the financial statements and the part of the Remuneration Report to be audited. It also includes an assessment of the significant estimates and judgments made by the Institute and Chief Executive in the preparation of the financial statements, and of whether the accounting policies are most appropriate to the Institute's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations which I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements and the part of the Remuneration Report to be audited are free from material misstatement, whether caused by fraud or error, and that in all material respects the expenditure and income have been applied to the purposes intended by the Assembly and the financial transactions conform to the authorities which govern them. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements and the part of the Remuneration Report to be audited.

#### Opinions

In my opinion:

- the financial statements give a true and fair view, in accordance with the Agriculture (Northern Ireland) Order 2004 and directions made thereunder by the Department of Agriculture and Rural Development, of the state of the Institute's affairs as at 31st March 2008 and of its net operating cost for the year, cash flows and recognised gains and losses for the year then ended;
- the financial statements and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Agriculture (Northern Ireland) Order 2004 and the Department of Agriculture and Rural Development's directions made thereunder; and
- information which comprises the Management Commentary and the unaudited part of the Remuneration report included within the Annual Report is consistent with the financial statements.

## Audit Opinion on Regularity

In my opinion, In all material respects the expenditure and income have been applied to the purposes intended by the Assembly and the financial transactions conform to the authorities which govern them.

#### Report

I have no observations to make on these financial statements.

Ja 2l

JM Dowdall CB Comptroller & Auditor General Northern Ireland Audit Office 106 University Street Belfast BT7 1 EU

16 December 2008

# 3.5 Accounts

## Agri-Food and Biosciences Institute

## Annual Report and Accounts

Income and Expenditure Account for the year ended 31 March 2008

		2008	2007
	Note	£000	£000
Income			
Income from operating activities	2	8,240	6,194
Other finance income: Net Return on Employer			
Assets	12a	72	133
Total income		8,312	6,327
Expenditure			
Programme related costs	5	9,187	9,154
Administrative expenses			
Staff costs	3	30,093	20,165
Other costs	4	16,206	15,412
Notional cost of capital		258	299
Total expenditure		55,744	45,030
Net expenditure for the year		(47,432)	(38,703)

All activities derive from operating activities. Notes 1 to 26 form part of the accounts.

## Statement of recognised gains and losses for the year ended 31 March 2008

Net (gain) / loss on the revaluation of		£000	£000
tangible fixed assets	14	(173)	(364)
Actuarial loss recognised for the financial year	12a	(892)	1,807
(Gain) / loss		(1,065)	1,443

## Agri-Food and Biosciences Institute Annual Report and Accounts Balance Sheet as at 31 March 2008

	Note	2008			2007	
		£000	£000	£000	£000	
Fixed Assets						
Tangible Assets	6	12,751		11,713		
Intangible Assets	7	221		274		
			12,972		11,987	
Current Assets						
Stock	8	1,078		578		
Debtors	9	3,757		3,137		
Cash in hand	10	702		14	_	
		5,537		3,729		
Creditors: Amounts falling d	Je					
within 1 year	11	(6,714)		(4,789)	_	
Not ourrent accete			(1 177)		(1.060)	
iver current assets			(1,177)		(1,000)	
Total assets less current liab	ilities		11,795		10,927	
Provisions for liabilities						
and charges	12		(6,254)		(1,486)	
		-	5,541		9,441	
Capital & Reserves		=		= =		
General Reserve	13		4,364		8,541	
Revaluation Reserve	14		960		900	
Donated Assets Reserve	15		217		-	
		-	5,541		9,441	

Approved by the Board and signed on its behalf by

Chief Executive and Accounting Officer

12/08 Date



•••• 93 ••••

## Agri-Food and Biosciences Institute Annual Report and Accounts Cash Flow Statement for the year ended 31 March 2008

	Note	2008	2007
		£000	£000
Net cash outflow from operating activities	16.1	37,620	39,334
Capital Expenditure			
Payments to acquire tangible fixed assets		2,390	2,247
Payments to acquire intangible fixed assets		44	197
Receipts from sale of tangible fixed assets		(2)	(25)
Net Cash Outflow Before Financing		40,052	41,753
Financing			
Grant in Aid from DARD: Capital		(2,792)	(2,444)
Grant in Aid from DARD: Resource		(39,200)	(38,040)
Increase in Net Cash and Cash Equivalents	S	(1,940)	1,269
Movement in Cash Balances	16.2	(1,940)	1,269

# 3.6 Notes to the Accounts for the Year Ended 31 March 2008

## **1. ACCOUNTING POLICIES**

## Statement of accounting policies

These financial statements have been prepared in accordance with the 2007/08 Government Financial Reporting Manual (FReM) issued by DFP and the Accounts Direction issued by DARD on 19 April 2006. The accounting policies contained in the FReM follow UK generally accepted accounting practices for companies (UK GAAP) to the extent that it is meaningful and appropriate to the public sector.

Where FReM permits a choice of accounting policy, the accounting policy judged to be the most appropriate to the particular circumstances of the Institute, for the purpose of giving a true and fair view, has been selected.

The Institute's accounting policies have been applied consistently in dealing with the items considered material in relation to the accounts. The particular accounting policies adopted by the Institute are described below.

## Accounting convention

These accounts have been prepared under the historical cost convention modified to account for the revaluation of fixed assets and livestock.

## Tangible and intangible fixed assets

- (1) The Institute does not own any land and buildings but leases them from DARD.
- (2) Other non-property assets are stated at current cost using appropriate indices to account for the effects of inflation.
- (3) The threshold for capitalisation is £5,000 excluding VAT. However, as the Institute is subject to irrecoverable VAT, the irrecoverable amount in relation to that asset is added to cost for capitalisation in accordance with Statement of Standard Accounting Practice 5 'Accounting for Value Added Tax'.
- (4) The Institute does not capitalise fixtures, fittings and office furniture.

#### **Donated fixed assets**

Donated fixed assets are capitalised at their current value on receipt and this value is credited to the donated asset reserve. Donated fixed assets are valued and depreciated as described above for purchased assets. Gains and losses on revaluations are also taken to the donated asset reserve and, each year, an amount equal to the depreciation charge on the asset is released from the donated asset reserve to the income and expenditure account. Similarly, any impairment on donated assets charged to the income and expenditure account is matched by a transfer from the donated asset reserve. On sale of donated assets, the value of the sale proceeds is transferred from the donated asset reserve to the lncome and Expenditure Reserve.

## Depreciation

Assets in course of construction are not depreciated.

Depreciation is charged on a straight line basis in order to write off the valuation of assets, less estimated residual value, of each asset over the expected useful life. The useful lives of tangible assets, which are reviewed regularly, are:

Plant	3 to 15 years
Equipment	5 to 20 years
Transport equipment: boats	5 to 15 years
Transport equipment: vehicles	5 to 10 years
Information technology: computers	3 to 6 years

The useful lives of intangible assets, which are reviewed regularly, are Software 2 to 10 years

#### Debtors

Provision is made where necessary for debts which are considered doubtful. Debts can only be written off when non recovery is considered certain and after the approval of senior management in accordance with the internal delegation limit.

#### **Taxation**

The Institute is not liable to corporation tax on income earned in the year. Value Added Tax (VAT) is accounted for in accordance with Statement of Standard Accounting Practice 5 in that amounts are shown net of VAT except where irrecoverable VAT is charged to the operating cost statement or capitalised where it relates to the purchase of a fixed asset.

## **Provisions**

The Institute makes provisions for liabilities and charges where, at the balance sheet date, a legal or constructive liability exists (i.e. a present obligation for past events exists), where the transfer of economic benefits is probable and a reasonable estimate can be made. Where the time value of money is material, the Institute discounts the provision to its present value using a standard Government discount rate, which currently stands at 3.5%.

#### Pensions

Present and past employees are covered by the Principal Civil Service Pension Scheme (Northern Ireland) (PCSPS (NI)), which is a defined benefit scheme and is unfunded and non-contributory. The Institute recognises the expected cost of providing pensions on a systematic and rational basis over the period during which it benefits from employees' services by payment to the PCSPS (NI) of amounts calculated on an accruals basis. All pension contributions are charged to the Income and Expenditure Account when incurred.

## NILGOSC

The closure of the ARINI pension scheme raised a potential liability of £3 million arising from a deficit in the former ARINI pensions fund and a cessation penalty imposed by the administrators of the scheme due to the loss of future contributions. The closing ARINI accounts included a provision for £3 million which is consolidated in the AFBI opening position. Further advice, from the Government Actuary Department, received by the Institute indicated that the provision should be £1.458 million as at 31 March 2007. AFBI has been advised that the deficit should be increased to £6 million as at 31 March 2008.

The Northern Ireland Local Government Superannuation Committee Scheme (NILGOSC) is a defined benefit statutory scheme, administered in accordance with the Local Government Pension Scheme Regulations (Northern Ireland) 2002, as amended. It is contracted out of the State Second Pension. This is fully funded defined benefit scheme that provides benefits on a final salary basis at a normal retirement age of 65. Benefits accrue at the rate of 1/80th of pensionable salary for each year of service. In addition a lump sum equivalent to 3/80th's of pensionable salary is payable on retirement. From 1 April 2006 all the former ARINI staff transferred to the PCSPS (NI), therefore were no contributions payable in the period and no further payments in future years. An actuarial valuation was carried out at 31 March 2008 in accordance with Financial Reporting Standard 17 and Financial Reporting Manual (FReM) and the details of the valuation are shown in note 12a.

Actuarial gains and losses are taken to reserves and shown in the Statement of Total Recognised Gains and Losses.

## • Valuation method:

The liabilities under the scheme have been valued using the projected unit method.

#### • Financial assumptions:

The principal financial assumptions used are shown in the table below.

Assumptions as at	31 March 2008 % per annum	Real % p.a.	31 March 2007 % per annum	Real % p.a
Price increases	3.6%	0.0%	3.2%	0.0%
Salary increases	5.1%	1.5%	4.7%	1.5%
Pension increases	3.6%	0.0%	3.2%	0.0%
Discount rate	6.9%	3.2%	5.4%	2.1%

The inflation assumption has been derived by considering the difference in gross redemption yields of traditional and index linked gilt edged securities at the year end. Salary increases are assumed to be 1.5% more than price increases, in line with the assumption used in the latest formal valuation of the Fund.

The discount rate used is the return on a high quality corporate bond of the equivalent term and currency to the liability.

## • Expected Return on Assets

The expected return on assets is based on the long term future expected investment return for each asset class as at the beginning of the period. The assumed returns are net of investment expenses and allowances have been included in the cost of accruing benefits for administration expenses.

The following table shows the expected rate of return in respect of each class of asset.

Asset Class	Expected Return at	Expected Return at
	31 March 2008	31 March 2007
	% p.a.	% p.a.
Equities	7.7%	7.8%
Bonds	5.7%	4.9%
Property	5.7%	5.8%
Cash	4.8%	4.9%

#### Bulk transfers

No allowance has been made for the bulk transfer of the past service benefits to the PCSPS (NI). The terms of the bulk transfer have not yet been formally agreed and details are not yet known of which members will transfer their benefits from the Fund to PCSPS (NI). Accordingly, no assets have yet been transferred across to PCSPS (NI).

#### Deferred Tax

No adjustment has been made for any deferred tax.

#### **Recognition of Surplus / Deficit**

The Institute has a 'constructive obligation' to fund any deficit allocated to its share of the Fund and it therefore fully recognises the whole of any deficit.

#### Early departure costs

The Institute is required to meet the additional cost of benefits beyond the normal PCSPS (NI) benefits in respect of employees who retire early. The Institute recognises in full for this cost when the early retirement programme is committed.

#### Grant in aid

Grant in aid represents net funding received from DARD and is credited to general reserves.

#### Income

Income from operating activities represents:

• Funding received from other organisations, including funding from the European Union.

Such income is matched against programme expenditure where possible;

• Other income receivable, principally, fees and charges for services provided.

## Programme expenditure

Programme expenditure comprises the costs of undertaking activities in support of discharging the Institute's responsibilities and is accounted for on an accruals basis.

## Administration expenses

Administration expenses reflect the cost of running the Institute.

#### Leases

Operating lease rentals are charged directly to the Operating Cost Statement over the period of the lease. There are no finance leases.

## Capital charge

A non-cash capital charge, reflecting the cost of capital utilised, in included in the Income and Expenditure Account and calculated using the average method. The charge is calculated at Government's standard rate of 3.5% in real terms on assets less liabilities.

#### Stock and work in progress

Livestock is valued at market value. Other stocks are valued at the lower of cost and net realisable value.

## **Contingent Liabilities**

Legal claims are assessed together and a provision of 50% of the likely maximum claim value is made. The percentage will be reviewed periodically to ensure it represents a reasonable estimate of the expenditure on such claims

# 2. Income

	2008	2007
	£′000	£′000
Income from analytical, diagnostic work and research contracts	7,012	5,184
Sale of general produce and livestock	1,006	772
Charter of ship	215	229
Rents receivable	7	9
Total	8,240	6,194

## Fees and charges

A detailed analysis of the required information is not provided as the full cost of each service provided does not exceed £1m and the income and cost of each service provided is not material to the accounts.

# 3. Staff Costs and Employee information

## Staff with a permanent UK employment contract with AFBI

	2008	2007
	£′000	£'000
Salaries and wages	19.140	18.522
Social security costs	1,354	1,384
Other pension costs	3,297	3,126
Other staff engaged on objectives of AFBI		
Short term and casual staff	796	349
Adjustment to pension liabilities	5,506	(3,216)
	30,093	20,165

## Staff with a permanent UK employment contract with AFBI

The average numbers employed during the year is as follows:

Board members (including Chairperson)	13
Administration	84
Scientific	631
Industrials	82
Short term and casual staff	90

The Principal Civil Service Pension Scheme (Northern Ireland) (PCSPSS (NI)) is an unfunded multi-employer defined benefit scheme, which produces its own resource accounts, but the Agri-Food and Biosciences Institute is unable to identify its share of the underlying assets and liabilities. The most up-to-date actuarial valuation was carried out as at 31 March 2003 and details are available in the PCSPSS (NI) accounts.

For 2007/08, employer's contributions of £3,296,556.72 (2006/07 £3,126,230.94) were payable to the PCSPS (NI) at one of four rates in the range 16.5 to 23.5 percent (2006/07: 16.5 to 23.5 percent) of pensionable pay based on salary bands. The contribution rates reflect benefits as they are accrued, and reflect past experience of the scheme.

Employees joining after 1 October 2002 could opt to open a partnership pension account or a stakeholder pension with an employer contribution.

Employer's contributions were paid to one or more of a panel of four appointed stakeholder pension providers. Employer contributions are age related and range from 3 to 12.5 per cent of pensionable pay. Employers also match employee contributions up to 3% of pensionable pay. In addition, employer contributions of 0.8% of pensionable pay were payable to PCSPS (NI) to cover the cost of future lump sum benefits on death in service and ill health retirement of these employees.

# 4. Administrative costs: other

		2008		2007
	£′000	£′000	£′000	£′000
Travel and subsistence		313		247
Computer support		179		123
Accommodation costs Lease of land and buildings Rates and water Electricity Oil Gas Repairs and maintenance	6,759 974 858 210 676 561	10,038	6,766 949 843 128 582 685	9,953
Postage, printing and stationery		185		179
<b>Communications and marketing</b> Telephone Marketing and advertisements	270 117	387	259 79	338
Internal consultancy and recruitment		36		87
Contracted out services		1,610		1,611
Hospitality		28		8
Training, conferences and library expense	es	1,038		950
Legal costs and compensation		17		35
Increase in provision for legal costs		226		9
Irrecoverable VAT		1,568		1,296
Other expenses		130		125
Depreciation		382		334
Asset impairment		25		72
Audit fees		44		45
		16,206		15,412

# 5. Programme costs

	2008	2007
	£000	£000
Livestock purchases adjusted for stock	(198)	588
Animal feed and veterinary expenses	624	347
Laboratory consumables	1,673	1,517
Plants, shrubs, fertiliser	145	190
Motor and tractor expenses	306	415
Laboratory equipment maintenance and other expens	ses 998	824
Apparatus, glassware and minor equipment	1,180	882
Protective clothing	75	75
Clinical and other waste disposal costs	560	450
Hire of plant and vehicles	97	89
Ship operating costs	1,737	1,606
Other expenses	327	347
Debt provision and charges	234	(37)
Depreciation	1,480	1,874
Profit on disposal of fixed assets	(2)	(13)
Release from Donated Assets Reserve	(49)	-
	9,187	9,154

# 6. Tangible fixed assets

	Plant & machinery £'000	Information Technology £'000	Transport Equipment £'000	Donated assets £'000	Assets under construction £'000	Total £'000
Cost or valuation At 1 April 2007	19,423	1,423	2,822	-	-	23,668
Additions	1,030	268	508	266	584	2,656
Disposals	(168)	-	(24)	-	-	(192)
Revaluations	237	-	97	2	-	336
Impairments	-	(53)	-	-	-	(53)
At 31 March 2008	20,522	1,638	3,403	268	584	26,415

	Plant & machinery £'000	Information Technology £'000	Transport Equipment £'000	Donated assets £'000	Assets under construction £'000	Total £'000
Depreciation						
At 1 April 2007	(10,360)	(734)	(861)	-	-	(11,955)
Charge for the year	(1,195)	(293)	(236)	(49)	-	(1,773)
Disposals	168	-	24	-	-	192
Revaluations	(137)	-	(26)	-	-	(163)
Impairments	-	35	-	-	-	35
At 31 March 2008	(11,524)	(992)	(1,099)	(49)	-	(13,664)
Net book value						
At 31 March 2007	9,063	689	1,961	-		11,713
At 31 March 2008	8,998	646	2,304	219	584	12,751

# 7. Intangible fixed assets

Intangible fixed assets comprise software licences.

	£′000	
Cost or valuation At 1 April 2007	325	
Additions	44	
Disposals	-	
Revaluations	-	
Impairments	(11)	
At 31 March 2008	358	
	£′000	
Depreciation At 1 April 2007	(51)	
Charge for the year	(90)	
Disposals	-	
Revaluations	-	
Impairments	4	
At 31 March 2008	(137)	
Net book value At 31 March 2007	274	
At 31 March 2008	221	

# 8. Stock

	2008 £000	2007 £000
Livestock and sundry stock at Hillsborough and VSD Stores at Newforge and Stoney Road	952 126	447 131
	1,078	578

# 9. Debtors

	£000	2008 £000	2007 £000 £000	
Amounts falling due within one year Trade debtors	1,867		2,290	
Less: Bad debt provision	(268)	1 599	(34)	
Other debtors		187	98	
Prepayment and accrued income		1,971	783	
	_	3,757	3,137	
Amounts owed by Central Government bodies		1,893	1,996	
Amounts owed by bodies outside Central Government		1,864	1,141	
	_	3,757	3,137	
10. Cash in hand		2008 £000	2007 £000	
Bank No 1 Account Petty cash		699 3	11 3	
	-	702		

# 11. Creditors

	2008	2007
	£000	£000
Amounts falling due within one year Bank overdraft	-	1,252
Vat	286	185
Other taxation and social security	11	5
Trade creditors	2,750	2,740
Capital creditors	99	48
Accruals and deferred income	3,568	559
	6,714	4,789
Amounts owed to Central Government bodies	2,586	841
Amounts owed to bodies outside Central Government	4,128	3,948
	6,714	4,789

# 12. Provisions

			departure	
	NILGOSC £000	Other £000	costs £000	TOTAL £000
Balance at 1 April 2007	(1,458)	(28)	-	(1,486)
(Additions) / Deductions	(5,506)	(226)	(21)	(5,753)
Payments	-	-	21	21
Actuarial Gain / (Loss)	892	-	-	892
Income	72	-	-	72
Provisions	(6,000)	(254)	(0)	(6,254)

Provisions have not been discounted as these relate to payments due to be paid in the near future.
#### NILGOSC

The closure of the ARINI pension scheme raised a potential liability of £3 million arising from a deficit in the former ARINI pensions fund and a cessation penalty imposed by the administrators of the scheme due to the loss of future contributions. Further advice, from the Government Actuary Department, received by the Institute indicates that the provision should be revised to £1.458 million as at 31 March 2007. AFBI has been advised that the deficit should be increased to £6 million as at 31 March 2008.

#### Other

These relate to legal cases due to come to the tribunals in the coming year. Legal claims are assessed together and a provision of 50% of the likely maximum claim value is made. This percentage is to reviewed on an ongoing basis to ensure it continues to represent a reasonable estimate of the expenditure on such claims.

#### 12a Pensions Provision: NILGOSC

#### Analysis of Amount Charged to Operating Profit

	Year to 31 March 08		Y 31 M	'ear to Aarch 07
Amount charged to operating profit	£000	% of Payroll	£000	% of Payroll
Service cost	-		-	
Past Service Cost	-		-	
Decrease in irrecoverable Surplus	-		(1,080) -	
Adjustment to opening provision and				
cessation adjustments	-		(2,136)	
Total Operating Charge (A)	-	0.00%	(3,216)	0.00%
Amount Credited to Other Finance Income				
Expected Return on Employer Assets	684		702	
Interest on Pension Scheme Liabilities	(612)		(569)	
Net Return (B)	72		133	
Net Revenue Account Cost (A) - (B)	(72)		(3,349)	

# Analysis of Amount Recognised in Statement of Total Recognised Gains and Losses (STRGL)

3'	Year to 1 March 08 £000	Year to 31 March 07 £000
Actual Return Less Expected Return on Pension Scheme Assets	(1,015)	(121)
Experience Gains and Losses arising on Scheme Liabilities	380	-
Changes in Assumptions underlying the Present Value of Scheme Liabilities	1,527	(1,686)
Actuarial Gain / Loss in Pension Plan	892	(1,807)
Increase/(Decrease) in Irrecoverable Surplus from Membership Fall and Other Factors	-	-
	892	(1,807)

## Movement in Surplus / Deficit during the year

	Year to 31 March 08 £000	Year to 31 March 07 £000
Surplus/Deficit at the Beginning of the year	(1,458)	(370)
Current Service Cost	-	-
Employer Contributions	-	-
Contributions in respect of Unfunded Benefits	-	-
Other Income	-	-
Other Outgo (e.g. expneses, etc.)	-	-
Past Service Costs	-	-
Impact of Settlements and Curtailments	-	1,080
Net Return on Assets	72	133
Actuarial Gains / (Losses)	892	(1,807)
Surplus/(Deficit) at End of Year	(494)	(964)
Adjustment as a result of proposed bulk transfer	(5,506)	(494)
Balance as per note 12	(6,000)	(1,458)

#### Balance Sheet Disclosures as at 31 March 2008

	31 March 08	31 March 07
Price increases	3.6%	3.2%
Salary increases	5.1%	4.7%
Pension increases	3.6%	3.2%
Discount rate	6.9%	5.4%

#### Assets employed

		Long Term	L	ong Term
		Return at		Return at
	Year to 3	31 March 08	Year to 31	March 07
	% per annum	£000	% per annum	£000
Equities	7.7%	7,987	7.8%	7,986
Bonds	5.7%	1,174	4.9%	1,495
Property	5.7%	822	5.8%	1,090
Cash	4.8%	157	4.9%	121
Total	7.3%	10,140	7.2%	10,692

Net Pension Asset as at

	Year to	Year to
31 N	March 08	31 March 07
	£000	£000
Estimated Employer Assets (A)	10,140	10,692
Present Value of Scheme Liabilities	10,081	11,656
Present Value of Unfunded Liabilities	-	
Total Value of Liabilities (B)	10,081	11,656
Impact of Irrecoverable Surplus	(59)	-
Net Pension Asset (A-B) before cessation adjustment	-	(964)

### 13. General Reserve

	2008	2007
	£000	£000
Balance at 1 April 2007	8,541	8,116
Grant in Aid from DARD	41,992	40,484
Net operating cost	(47,432)	(38,703)
Actuarial gain/(loss) (see note 12a)	892	(1,807)
Transfer from Revaluation Reserve	113	152
Cost of capital	258	299
	4,364	8,541

## 14. Revaluation Reserve

	2008	2007
	£000	£000
Balance at 1 April 2007	900	688
Arising on revaluation in the year	173	364
Transfer to General Fund of realised element	(113)	(152)
	960	900
15. Donated Assets Reserve		
	2008	2007
	£000	£000
Balance at 1 April 2007	-	
Additions during the year	266	-
Transfer to Income Statement	(49)	-
Balance at 31 March 2008	217	

#### 16. Cash flow statement

16.1 Reconciliation of operating deficit to net cash outflow from operating activities

	Note	2008		2007
	£000	£000	£000	£000
Net operating cost		(47,432)		(38,703)
Adjustments for non-cash transactions				
Depreciation	1,862		2,208	
Impairment of Fixed Assets	25		72	
Profit on disposal of fixed assets	(2)		(13)	
(Decrease) / Increase in provision of legal	costs 226		9	
Cost of capital	258		299	
Net adjustment to pension provision	5,434		(3,349)	
(Decrease) / Increase in bad debt position	234	_	(37)	
Total non-cash transactions movement		8,037		(811)

## Adjustments for movement in working capital other than cash

(Increase) / decrease in stock (Increase) / decrease in debtors Increase / (decrease) in creditors	(500) (854) 3,129	339 (2,271) 2,112	
Total movements in working capital			
other than cash	1,775	5	180
Net cash flow from operating activities	(37,620	)	(39,334)
16.2 Analysis of movement in cash balance	S		
	2008	}	2007
	£000	)	£000
Opening cash and bank balances (overdrawn)	1,238	3	31
Closing cash and bank balances	702	<u> </u>	(1,238)
	(1,940)		1,269

#### 17. Capital commitments

The Institute has no capital commitments at the year end.

#### 18. Commitments under leases

The Institute had no material operating lease obligations in 2007/2008. At the year end commitments existed in respect of annual rentals of £6,720,000 per annum for the foreseeable future.

	£'000
Within one year	6,720
In the second to fifth years	26,880

#### 19. Finance leases

The Institute had no finance leases during 2007/2008.

#### 20. Commitments under PFI contracts

The Institute had no PFI contracts during 2007/2008.

#### 21. Contingent liabilities

There are no contingent liabilities at the year end.

#### 22. Financial Instruments

The Institute is not allowed to borrow or invest surplus funds as per the Management Statement and Financial Memorandum. Financial assets and liabilities are generated by operational activities and are not held to handle the risk profile facing the Institute in undertaking its operations.

#### Liquidity risk

The Institute's net revenue resource requirements are financed by the Grant in Aid agreed with the Department of Agriculture and Rural Development, as is its capital expenditure. It is not, therefore exposed to significant liquidity risks.

#### Interest rate risk

All the Institute's financial assets and liabilities carry nil rate of interest and it is not therefore exposed to significant interest rate risk.

#### Foreign currency risk

The Institute's assets and liabilities are denominated in sterling so it has no exposure to currency risk.

#### Fair values

The book values and fair values of the financial assets and liabilities at 31 March 2008 are not considered to be materially different.

#### 23. Losses and special payments

#### a) Losses statement

There were no cases where significant losses had been incurred.

#### b) Special payments

There were no cases of ex-gratia payments or extra-statutory payments.

#### 24. Related party transactions

The Department of Agriculture and Rural Development is the parent Department of the Institute with which it had various material transactions during the year and is regarded as a related party.

In addition the Institute had some transactions with other government departments and other central government bodies. Most of these transactions have been with Northern Ireland departments and their executive agencies such as DFP (including CPD and Pensions Branch), DCAL, DOE, FSA (NI), HMRC and DEFRA.

	2008	2007
	£′000	£'000
Debtors (amounts due within one year) (Note 9): Balances with other central government bodies	1,893	1,996
Creditors (amounts due within one year) (Note 11):	2,586	841

#### 25. Third party assets

The Institute does not hold any third party assets.

#### 26. Post Balance Sheet events

There were no events after the Balance sheet date which would require adjustment to the financial statements.



AFBI's mission is to maintain and enhance its reputation as a world-class scientific institute, delivering proven value to Government and other customers.

AFBI provides research and development, analytical and diagnostic services, and scientific advice in agriculture, food, animal and plant health, marine and fresh water ecosystem management and the agri-environment.

Our customers include a range of local, national and international commercial companies, Northern Ireland and United Kingdom Departments, Agencies, and associated bodies and the European Union.

We pride ourselves on the quality and breadth of our scientific expertise and maintain appropriate quality assured accreditation standards. AFBI has various national and international reference laboratories.

AFBI maintains a cutting edge skills and technology base to fulfil its statutory obligations including provision of rapid, scientific response capabilities for DARD and other Departments during emergencies. AFBI scientists have long standing experience and internationally recognised standards of providing evidence-based scientific advice to Government policy makers and commercial decision makers.

We are the partner/contractor of choice for many local, national and international bodies.

A major aim is to support industry by providing a "one-stop shop" for diverse specialist expertise and facilities.

AFBI's expertise includes:

Veterinary diagnostics; animal health and welfare; food science; crop and livestock systems; biometric traceability; plant breeding; biometrics and statistics; agricultural economics; renewable energy and non-food crop agronomy; oceanography; fish stock management, aquatic and land based ecosystem management of natural resources.

AFBI has facilities sited across Northern Ireland which include modern laboratories and secure animal accommodation and has a purpose built marine research vessel. The facilities have "state of the art" equipment required to resolve scientific problems and produce sophisticated and reliable results.

Technological capabilities include: molecular technologies; light and electron microscopy; mass spectrometry; pathogenesis studies; biosensor technology; seabed mapping and minimal processing technologies.



If you have a problem in agri-food or biosciences, AFBI has a high quality, cost-effective solution.

> To find out what AFBI can do for your business, contact: Chief Executive's Office

AFBI Headquarters Newforge Lane, Belfast BT9 5PX Northern Ireland, UK. Tel.: +44 (0)28 90 255689 Fax: +44 (0)28 90 255035 E-mail: info@afbini.gov.uk



ISBN 978-1-84807-083-7 © Crown Copyright 2009

## www.afbini.gov.uk