Annual Report 2009 and Financial Statements

teagasc

Agriculture and Food Development Authority
www.teagasc.ie

Contents

Introduction

The 2009 Annual Report is built around the goals outlined in the Teagasc Statement of Strategy 2008-2010. Key achievements and developments for the Agriculture Research, Food Research, Education and Development, Advisory, Corporate and Management Services, and Administration Directorates are described in the context of these goals. These Directorates were consolidated into three Directorates: Research, Knowledge Transfer and Operations by the end of 2009.

Highlights 2009

Dairy Expansion

In spite of depressed milk prices many farmers showed their commitment to the future of dairying. Well over 2,000 farmers attended Moorepark 09 themed 'New Thinking for Challenging Times' Teagasc researcher Padraig French said: ''World market price fluctuation is driven by changes in the overall supply/demand balance and this is set to continue.''

FAPRI-Ireland indicate that over the next decade, milk price in Ireland is likely to average from between 26 to 28 cent per litre. However, historical analysis of world markets shows that milk price could fluctuate between 20 and 40 cent per litre.

Dr. French maintained that the business strategy adopted at farm level in a fluctuating milk price scenario is substantially different to that where milk price is static. ''This requires dairy farmers to develop low cost highly efficient grass-based systems of milk production. Key to this requirement is a high EBI, high health status, compact calving herd, a long grazing season with increased reliance on high quality grazed grass, and low cost labour efficient farm infrastructures.''

In 2009 Teagasc further supported dairying by preparing for the Dairy Expansion Scheme, launching the Greenfield dairy site project in County Kilkenny and providing training to new entrants to dairying under the Dept. of Agriculture, Fisheries and Food New Entrants to Dairying Scheme.

Part of the large attendance at Moorepark 2009.

Pictured are Michelle Gildernew, Minister for the Department of Agriculture and Rural Development, Northern Ireland, CEO of AFBI Mr. Seán Hogan and Teagasc chairman Dr. Noel Cawley.

Research collaboration.

Scientific collaboration between the Agri-Food and Biosciences Institute (AFBI) and Teagasc was formally recognised with the signing of a Memorandum of Understanding (MoU) between the two organisations.

Both organisations wish to encourage substantial research co-operation in some or all of the fields of animal health and disease control, animal and crop production, climate change, renewable energies, grass breeding and utilisation, food safety and agricultural economics; all research being for the mutual benefit of the island of Ireland. The MoU will provide opportunities for the exchange of scientific staff to carry out joint research and/or to organise and attend scientific meetings, with a view to promoting the development of co-operative research.

Macra na Feirme Teagasc Leadership Training

Macra na Feirme and Teagasc came together to develop a Leadership Training module which is included in all Teagasc college courses, commencing from September 2009. This replaces the Communications Module with a more practical and applied module that will involve students actively participating in their own learning. This module involves the students setting up Macra clubs within the college and learning through participation in a variety of Macra activities such as public speaking, stockjudging, organising events and debating.

Facilities at Kildalton.

The Minister for Agriculture, Fisheries and Food, Brendan Smith TD, officially opened the new €4 million Education Building at Kildalton College, Piltown, Co. Kilkenny, which he described as "a significant step in the development of agricultural education in Ireland and is a clear demonstration of Teagasc's leading role as an education provider to the agriculture and food sector."

The new education facility incorporates a lecture theatre, classrooms, laboratories, library and a range of student recreation facilities. Kildalton College has been operating since 1971 and has a long tradition in providing agriculture and horticulture education programmes to the farming community. Over 600 students now attend further education and higher-level education programmes at the College.

The Director of Teagasc, Professor Gerry Boyle said: ''Since 2006, there has been a 76 per cent increase in agricultural college enrolments. We are delighted with the renewed interest in agriculture and horticulture courses. This year's enrolments amount to 1,577 and Teagasc now has a total of 3,222 students participating in courses.''

Mr. Brendan Smith T.D. Minister for Agriculture, Fisheries and Food, Tony Pettit, Professor Gerry Boyle and Chairman Dr. Noel Cawley at the opening of new facilities at Teagasc Kildalton.

Highlights 2009

Food Technology Support Programme

Teagasc announced the establishment of a new Food Technology Support Programme for small and medium sized food companies, at a major Open Day for the food industry taking place at the Food Research Centre, Moorepark in Fermoy.

Over several years Teagasc has been building a business plan for its research which is aimed at bridging the gap with food companies.

The Food SME Technology Support Programme, which is being set up with this aim, in partnership with Enterprise Ireland, will be staffed by technologists whose role will be to accumulate and transfer information that is directly applicable to food companies. These technologists will draw from the knowledge and expertise of Teagasc food researchers at Moorepark and Ashtown Research Centres, which they will augment from other knowledge sources, national and international.

By having such a corps of technologists, Teagasc aims to bridge the communication gap between public research and the general food industry, while at the same time accomplishing its mandate for high quality research and for innovation impact at the highest level of industrial research which will be key to driving the knowledge-based bioeconomy.

Pictured at the Food Research Open Day at Moorepark were Teagasc Director Professor Gerry Boyle, Chief Executive of Kerry Foods, Stan McCarthy and Prof. Frank Gannon, Director General SFI.

Beef Research Demo farm

Teagasc established a new suckler beef research demonstration farm at its Research Centre in Grange, County Meath. The unit is a 'stand-alone' 120 cow spring-calving suckler unit, and is being set up to demonstrate the most innovative technologies in beef production to improve productivity and profit levels on Irish farms. This is a new initiative, the main aim of which is to transfer knowledge out onto a greater number of beef farms.

Speaking at the launch, Teagasc Director, Professor Gerry Boyle, said that transferring knowledge to farmers and other stakeholders is one of the highest priorities for the organisation. All units have been challenged to come up with new and more innovative ways to transfer technology onto farms. The new initiatives launched in Grange, are good examples of Teagasc responding to the changing needs of Irish farmers.

Dr. Mark McGee, Project Leader, said the aim of the project is to establish a profitable suckler herd finishing beef animals and which will demonstrate how the results of research can be put into practice. He continued saying: ''The unit will demonstrate how to use grassland and animal production technologies in efficient and profitable beef systems''. It will be used as a benchmark for suckler beef production and will be an important part of the new drive in Teagasc to improve the transfer of technology out onto farms from research.

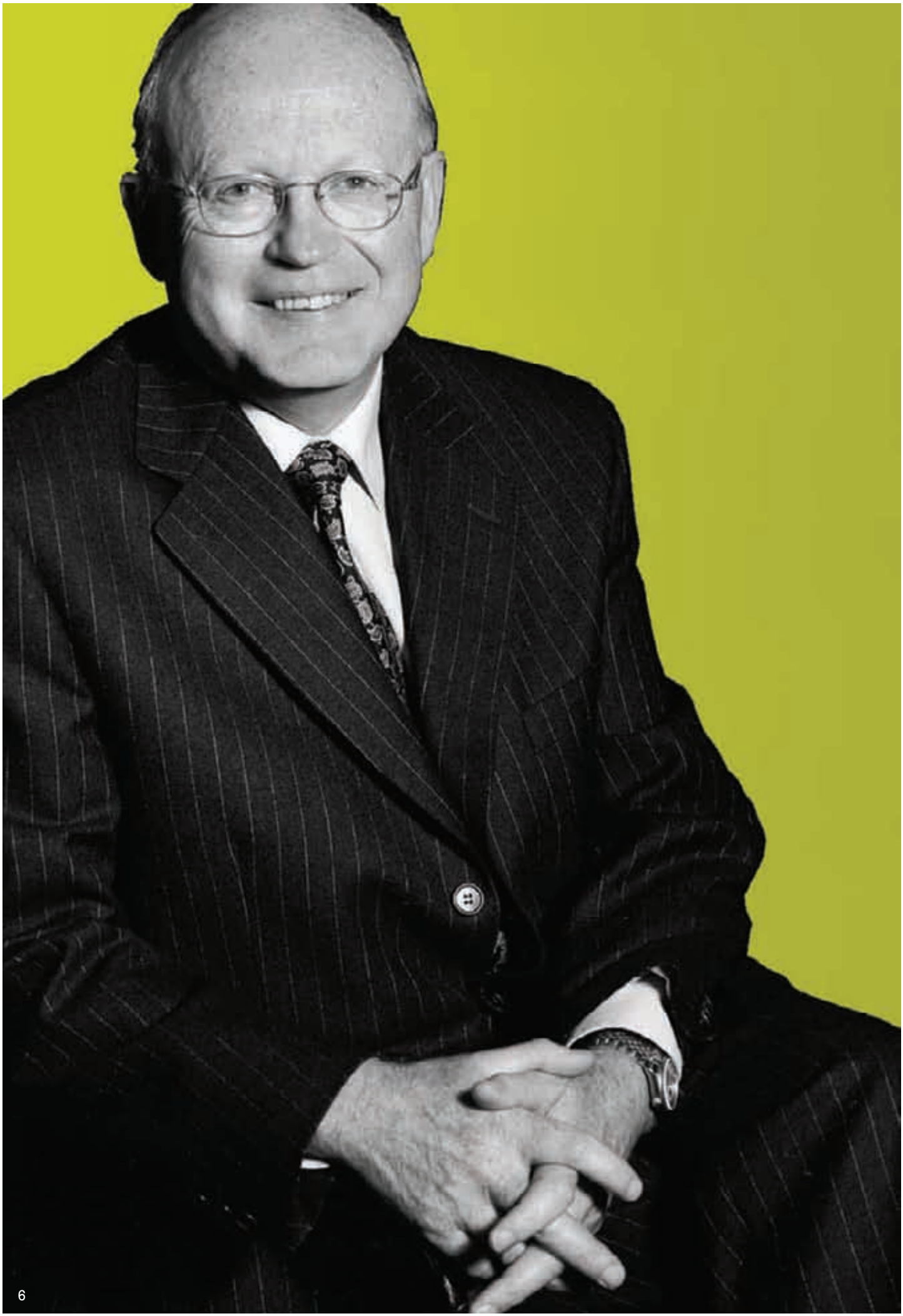
As part of its change programme, Teagasc has established an animal production and grassland research programme which brings together the organisation's activities from a number of centers across a range of ruminant enterprises to lever the knowledge-base within the organisation.

2009 saw the opening of the extension to Oak Park House, Carlow. Pictured are the team of people who were involved with the project.

Teagasc Double SFP Online Applications

Teagasc doubled the number of applications submitted online for the Single Farm Payment on behalf of farmers in 2009. Almost 20,000 applications were submitted online by Teagasc and advisers found that the system helped to reduce the paper volume and the risk of simple errors.

Dr. Tom Kelly said: ''There has been an enormous effort by Teagasc advisers all around the country to assist farmers to meet the closing date for both the Single Farm Payment scheme and for the REPS scheme. More advisers are now using the online option for the SFP for clients which has helped to improve the flow of work and ensure that clients are paid on time.''



CHAIRMAN'S STATEMENT

The farming and agri-food sector suffered a sharp decline in returns from international markets in 2009. Incomes on dairy and tillage farms suffered as a result of a drop in milk and grain prices. The Teagasc National Farm Survey for 2009 showed that family farm income for the year declined by 30 per cent to €11,968. This fall in farm income came after a 14 per cent drop in 2008 bringing the cumulative decline in family farm income to 40 per cent from 2007 levels. The largest declines last year occurred on specialist dairy farms, down by 23.6 per cent and farms with a mainly tillage enterprise mix were down by 12.6 per cent. Direct payments continue to be important in providing some income stability for farm families, with the average direct payment being €17,109 per farm. Off-farm employment and other external sources of income remain important for farm families with 79 per cent of farms having an external source of income, be it employment, pension or social assistance.

Agri-food exports with their low import dependency contribute significantly to the Irish economy, accounting for over half of our indigenous exports and representing one-tenth of the Irish economy. Notwithstanding the difficulties faced by the sector in 2009, the agriculture and food industry continues to make a significant contribution to the Irish economy, particularly in providing employment in rural areas.

During the year Teagasc provided a financial planning service to its farmer clients to assist and support them through difficulties caused by market volatility and reduced turnover.

The Teagasc grant-in-aid for 2009 was reduced due to the decline in the public finances. Teagasc management and the Authority had already initiated the development of the Teagasc Change Programme which prioritised the actions to be pursued by the organisation for the future. The first phase of the Change Plan was agreed in March 2009, with phase two of the plan approved by the Authority in December. Significant progress on implementing the Change Plan has already been made.

Research continues to be the cornerstone on which the successful advisory and education service is built, transferring new knowledge and technologies out onto farms and into businesses.

Authority Appointments

During 2009, the Minister for Agriculture, Fisheries and Food, Brendan Smith TD appointed Marie Christie, as staff representative to the Teagasc Authority for a five-year term. Marie replaced Stephen Flynn who had completed his term on the board. Stephen's contributions to the Authority and his commitment to Teagasc are greatly appreciated.

In January 2010, the Minister appointed Eddie Downey, Slane, County Meath and Tom Collins, Tullamore, County Offaly each for a term of five years to the Authority. Both bring a wealth of experience and knowledge of agriculture, farming and the agri-food industry and which will be of enormous benefit to the Authority. I thank Derek Deane for his valuable contribution and input to Teagasc during his period on the board.

Teagasc enjoys an excellent working relationship with the Minister for Agriculture, Fisheries and Food and his Department, led by the Tom Moran, Secretary General. This provides a solid leadership basis for Teagasc and the agriculture and food sectors. I thank the Director, Professor Gerry Boyle, for his skilled management during challenging and changing times for both the organisation and the wider industry, and I would like to thank the Teagasc staff for the research work and professional service they deliver to farmers and agri-food businesses across the country. Finally, I would like to thank my fellow colleagues on the Authority for their input and contributions during the year.

Dr. Noel Cawley
Chairman of the Teagasc Authority

REPORT OF THE DIRECTOR

This was a year of transition for Teagasc, as the organisation adjusted and adapted to the reduced budgetary position it found itself in. In March, the first phase of the Teagasc Change Programme was agreed and implementation on the individual aspects of the agreement proceeded during the year. In December, a second phase of the Teagasc Change Programme was agreed by the Authority laying out the next steps for the organisation to follow.

This process involved taking many difficult decisions as the organisation set its priorities for allocation of both human and financial resources for the years ahead. The two phases of the change programme will see 41 advisory offices close, with six closed during 2009. The research programme at the dairy research farm at Kilmaley was discontinued and since year end that farm has been sold. The soil testing service, operated from the environmental research centre in Johnstown Castle has been outsourced.

Management and Structural Change

The change programme advocated a change in the structure of Teagasc. The number of directorates has been reduced from six to three with a corresponding reduction in the number of senior managers. The agriculture and food research directorates have been combined and during the year Dr. Frank O' Mara was appointed as Director of Research.

A new Knowledge Transfer directorate was created by bringing together the advisory and educations units into one, and since the year end Dr. Tom Kelly has been appointed Director of Knowledge Transfer. This placed an increased emphasis on communicating and transferring existing and new knowledge and technologies out onto farms and into food firms.

Similarly the administration and management services directorates were combined and since year end, Tom Doherty has been appointed as Chief Operations Officer. This is the first step towards a more streamlined and leaner administration function in Teagasc.

Programme Driven Organisation

Along with the structural reorganisation, a move towards Teagasc becoming more programme driven commenced. A single Animal and Grassland Research Programme was created, which encompassed the work on grassland and livestock systems being undertaken at the centres in Athenry, Grange and Moorepark, and the grass breeding programme at Oak Park. This allows for greater leverage of common technology platforms across the main dairy, beef and sheep enterprises.

Professor Paul Ross was appointed to lead the Food Research Programme, which combines the activities at the Moorepark and Ashtown food research centres.

The Education Programme is now being delivered through three lead colleges - Ballyhaise and Kildalton Agricultural Colleges and the College of Amenity Horticulture in the Botanic Gardens, twelve regional education centres and the other private and Teagasc colleges. This new structure has ensured uniform standards of course offering to students across the country. Numbers attending Teagasc run courses continued to grow in 2009 reaching 3,222. The new facilities at the Kildalton colleges were officially opened by the Minister for Agriculture Fisheries and Food, Brendan Smith, during the year.

The move towards a programme structure has continued into 2010 and two new programmes – Crops, Environment and Land Use Programme and a Rural Economy and Development Programme are being developed.

Providing Leadership in Dairying and Beef

One of the leading events in 2009 was the Moorepark '09 dairy open day in June. This event was highly successful and was extremely important in terms of providing leadership for dairy farmers in a year when milk price and farm incomes fell dramatically due to volatility on international dairy markets.

In the beef sector, the setting up of a new suckler beef demonstration farm in Grange was very significant, in terms of providing guidance on best technologies and strategies to generate profit from a sector that has delivered low margins in recent years.

The BETTER Farm Programme which is already well established in beef and sheep was extended during 2009 to include tillage farms and dairy farms.

This model of Teagasc providing intensive advice and support for commercial units, to demonstrate new technologies and their impact at farm level has been successful. The three tillage farms are located in the main crop growing areas, while the dairy BETTER Farm Programme includes a Greenfield dairy unit in County Kilkenny and two other family farms expanding milk production.

Staff changes

During 2009 there were a significant number of staff reaching normal retirement and some colleagues opting for early retirement. In total over 200 people left the organisation in the year under review, and I want to acknowledge their contribution to Teagasc and to the agriculture and food industries during their careers. In particular, I want to pay tribute to the significant contribution of the six senior managers, Tom Kirley, Donal Carey, Tom Collins, Liam Donnelly, Seamus Crosse and Pat Boyle, who all retired in 2009. I wish them all well in their future endeavours.

I would also like to remember the passing of former colleagues who were deceased in 2009.

G. E. Boyle

Prof. Gerry Boyle
Director

TEAGASC – THE AUTHORITY

1
MR. JOE FITZGERALD
ICMSA Nominee

2
MR. EDDIE DOWNEY*
IFA Nominee

3
PROF. PATRICK FOTTRELL
Minister's Appointee

4
MR. PADRAIG GIBBONS
ICOS Nominee
(Joined Jan 2010)

5
MR. JAMES J BRETT
Minister's Appointee

6
MR. FRANK O'MAHONY
Macra na Feirme Nominee

7
MR TOM COLLINS**
Minister's Appointee

8
MR. MARTIN HERAGHTY
Minister's Appointee

9
MS. MARIE CHRISTIE***
Staff Rpresentative

10
DR. NOEL CAWLEY
Chairman - Teagasc

11
MS. MARGARET SWEENEY
Minister's Appointee-

MR. DEREK DEANE
IFA Nominee

MR. STEPHEN FLYNN
Staff Reprsentative

* (Joined Jan 2010 replacing Mr. Derek Deane.
** (Joined Jan 2010)
*** (Joined August 2009 replacing Mr. Stephen Flynn.

TEAGASC AUTHORITY COMMITTEES

Remuneration Committee

Dr. Noel Cawley (Chairman)
Mr. Martin Heraghty
Mr. Padraig Gibbons
Ms. Margaret Sweeney

Advisory and Education Committee

Mr. Frank O'Mahony (Chairman)
Mr. Eddie Downey
Ms. Marie Christie
Mr. Joe Fitzgerald
Mr. Padraig Gibbons

Research Committee

Prof. Patrick Fottrell (Chairman)
Mr. Tom Collins
Mr. Frank O'Mahony
Ms. Marie Christie

Audit Committee

Mr. James Brett (Chairman)
Ms. Margaret Sweeney
Dr. Noel Cawley
Mr. Martin Heraghty

Finance & HR Committee

Mr. Martin Heraghty (Chairman)
Dr. Noel Cawley
Ms. Marie Christie
Mr. James Brett
Mr. Joe Fitzgerald

Status January 2010

TEAGASC SENIOR MANAGEMENT

PROFESSOR GERRY BOYLE
Director

DR. FRANK O'MARA
Director of Research

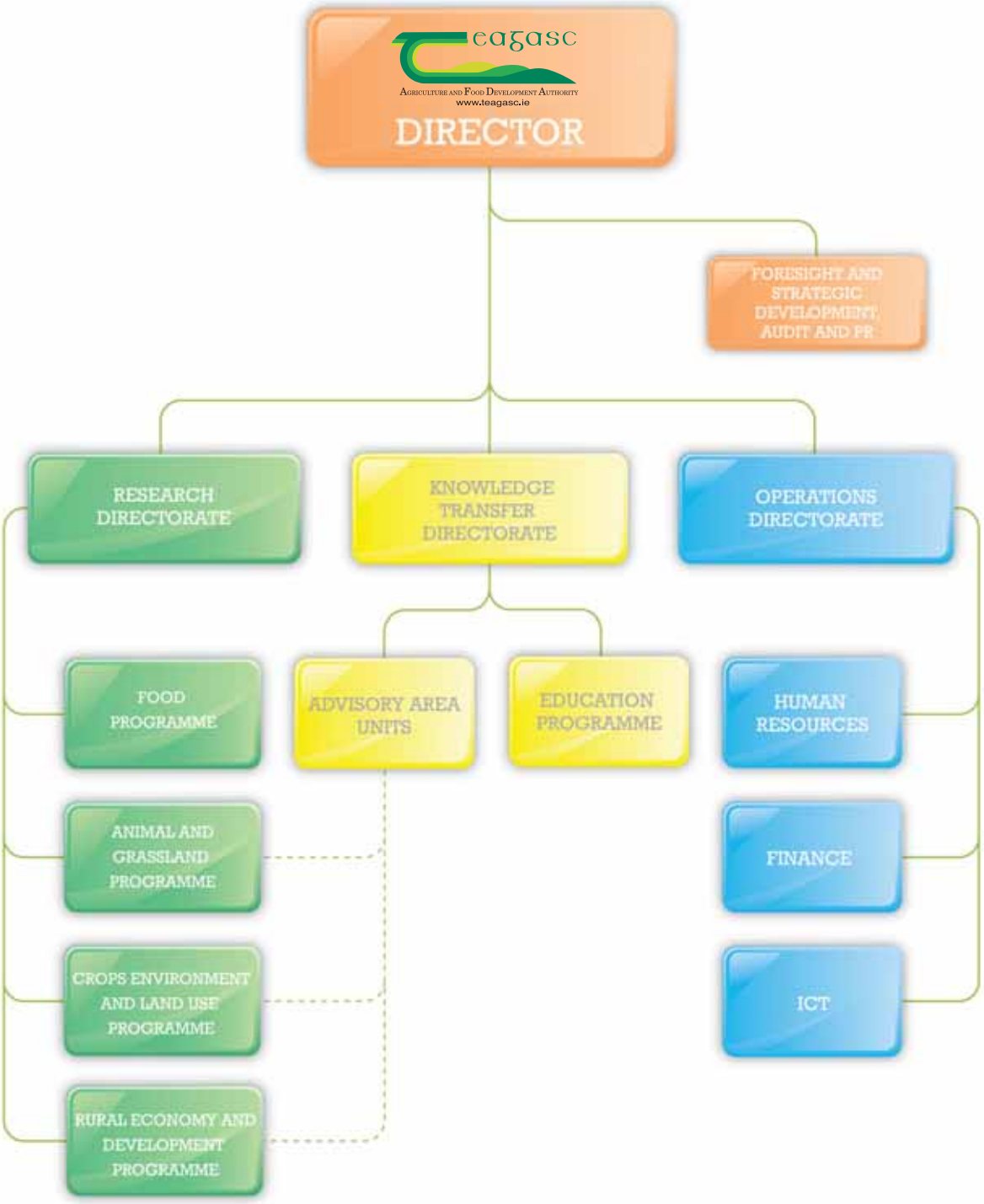
DR. TOM KELLY, *
Director of Knowledge Transfer

MR. TOM DOHERTY*
Chief Operating Officer

* Appointed in 2010

Mr Pat Boyle, Mr. Donal Carey, Dr. Seamus Crosse, Professor Liam Donnelly, Mr. Tom Kirley and Mr. Tom Collins retired in 2009.
During December 2009 Mr. Alan Phelan, Ms. Susan Kearney, Mr. Paddy Browne, Mr. Dermot McCarthy, Mr. James McGrath and Mr. Tom Doherty reported to Professor Gerry Boyle.

ORGANISATIONAL CHART January 2010



Status January 2010

TEAGASC OFFICES AND CENTRES

Status End of December 2009

GOAL 1

Improve the competitiveness of agriculture, food and the wider bio-economy

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Improve the competitiveness of agriculture, food and the wider bio-economy

RESEARCH

Grass based milk production systems for regions of high rainfall and heavy clay soil types

In Ireland, the two factors that have the largest influence on animal production from grassland farming are soil type and climate conditions. Work at the Kilmaley Research Farm has indicated that the most profitable spring milk production system is based on a feed budget of 2.1 tonnes of grass silage, 2.8 tonnes of grazed grass and 0.5 tonnes of concentrates per cow at a stocking rate of 2.0 cows per hectare with a nitrogen input of 210 kg per hectare.

An alternative system of milk production for high rainfall heavy clay soils is a higher concentrate feeding system allowing for higher animal performance per unit area.

Soil type and climate are key factors in determining stocking rates and production on dairy farms.

This system will be less dependent on achieving high animal performance from grass silage, while at the same time lowering fixed costs per unit of output. If concentrate supplementation could be used efficiently, allowing a higher stocking rate to be carried on the farm, this could potentially result in profits similar to pasture-based systems in free draining soils with low rainfall.

The objective of this study was to determine the biological efficiency of two different production systems on a high rainfall heavy clay soil based on differences in concentrate supplementation levels and stocking rates.

The research showed that successful dairying on heavy clay soils is dependant on having reasonable grazing conditions and making enough winter feed.
It is not profitable at low milk price with high inputs of concentrate and silage during the grazing season.

A new suckler beef research demonstration farm at Grange

The unit is a 'stand-alone' 120 cow spring-calving suckler unit, and was set up to demonstrate the most innovative technologies in beef production to improve productivity and profit levels on Irish farms. The main aim is to transfer knowledge onto a greater number of beef farms.

Dr. Mark McGee, Project Leader, said the aim of the project is to establish a profitable suckler herd finishing beef animals and demonstrate how the results of research can be put into practice.

The unit will demonstrate how to use grassland and animal production technologies in efficient and profitable beef systems. It will be used as a benchmark for suckler beef production and will be an important part of the new drive in Teagasc to improve the transfer of technology out to farms from research.

In laboratory trials Dr. Eugene O'Sullivan detected strains of septoria with new types of resistance to fungicides.

The new herd consists of four cow breed combinations. The continental cross cows will have a suckler beef value (SBV) which represents the top 5-10% of the national beef cow herd.

New developments in wheat disease control

Disease control is a key issue in wheat production in Ireland, and with our moist climate the use of fungicides is critical to producing economically sustainable yields. The use of fungicides invariably selects for strains of fungi that are less sensitive and therefore harder to control. Oak Park has been monitoring the sensitivity of the main diseases to the key fungicide products.

The most economically important wheat disease is leaf blotch caused by Septoria tritici. In early 2009 isolates of S. tritici were found in wheat crops that were much less sensitive in laboratory tests to the main fungicides used for their control. Molecular analysis of these isolates showed that they belonged to a new strain of S. tritici not reported before.

Although laboratory results do not always relate directly to performance of the fungicides in the field, the detailed analysis of these new strains of septoria allowed new guidelines to be developed for the industry for use in the 2009 season. These ensured high levels of disease control could be achieved while slowing any further selection for these new strains.

These new findings alerted researchers and manufacturers in neighbouring European countries to monitor their septoria populations for similar developments.

Experiments in 2009 tested the field performance of the fungicides and initial results indicated that the laboratory finding did seem to be reflected in disease control achieved in the field.

Work is on-going to monitor the continued development of these new disease strains as well as further test the impact they are likely to have in the field. This new data will be used to fine tune future recommendations to ensure that in commercial practice high levels of disease control and economically viable yields can be achieved.

Bull breeds

A Teagasc Grange study compared young bulls from Holstein-Friesian (HF), Norwegian Red (NR), Norwegian Red x Holstein-Friesian (NX) and Jersey (JX) for feed intake, growth and carcass traits. The relative slaughter weights for HF, NR, NX and JX were 100, 102, 101 and 95, respectively. Silage and concentrate intakes scaled for carcass weight were similar for HF, NR and NX, but JX had significantly higher values. Growth, slaughter and carcass traits were similar for HF, NR and NX, but JX grew more slowly although the difference, while significant, was relatively small. JX also had a lower kill-out proportion and a lower carcass weight. Carcass fat score was similar for all the breed types. All measures of carcass compactness were poorer for JX than for the other breed types.

DEVELOPMENT UNITS

Forestry

The Teagasc Forestry Development Unit conducts an integrated forestry advisory, research and training programme. The unit had a staff complement of 22 and a budget of €2.2m in 2009.

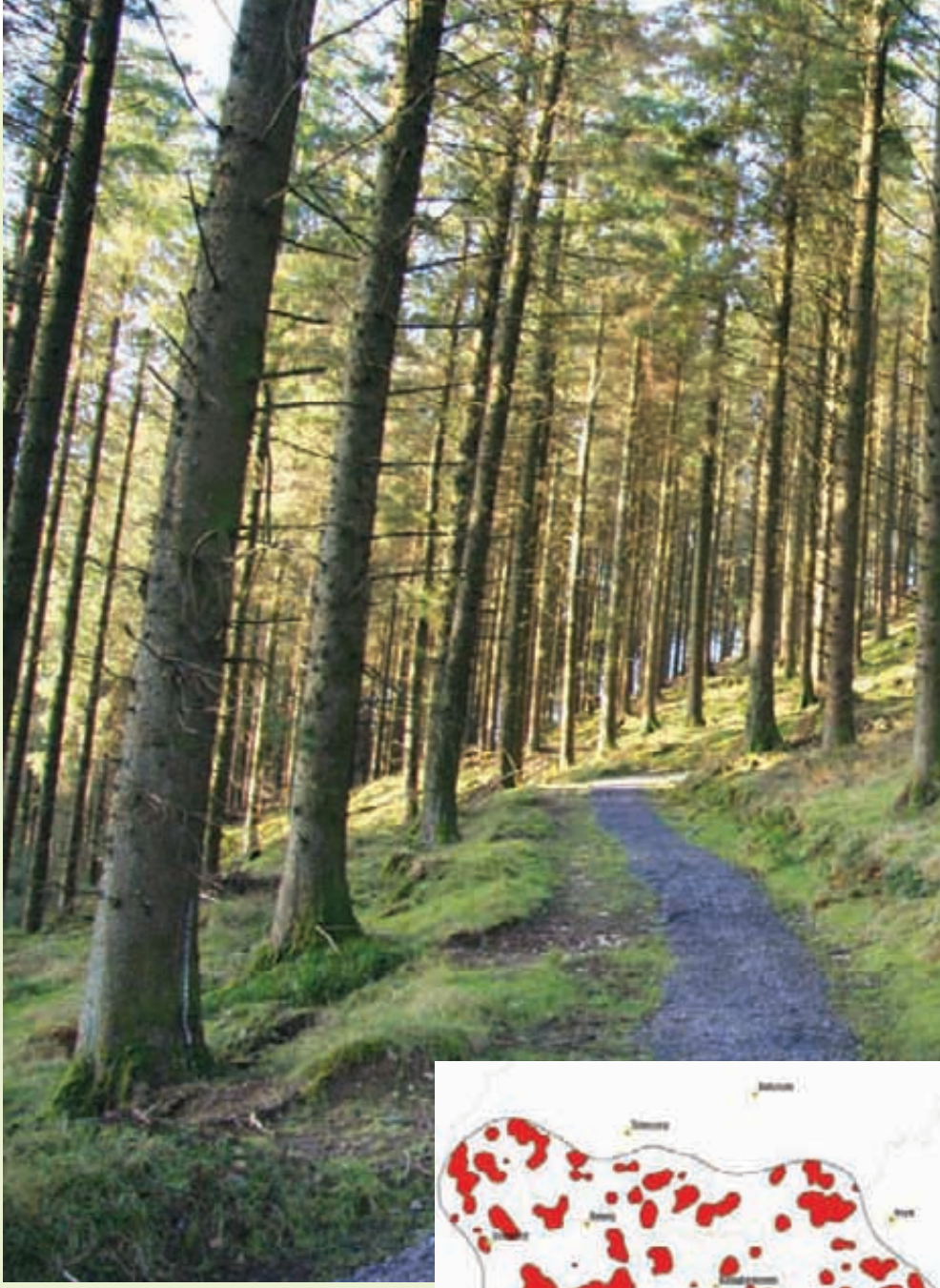
The Forestry Advisory and Training Programme is carried out in collaboration with the Forest Service. The objective is to ensure that farm forests are properly planned, established and managed to optimise the value of the forests from economic, social and environmental perspectives, to give the optimum return to the owners, the state and to the taxpayer. This is achieved by improving the awareness and the knowledge among landowners of forestry and all aspects of forest management.

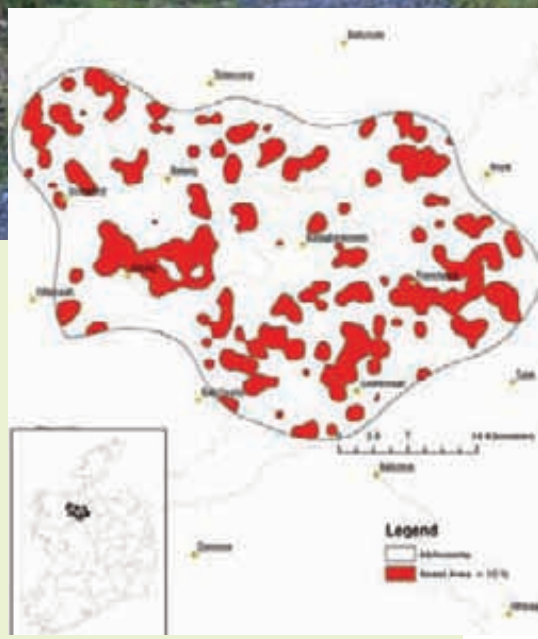
Forestry Advisory and Training Programme

Forestry promotion activities aimed at those who may not have yet considered forestry were again a significant aspect of the 2009 programme. Such events help to inform landowners of the positive benefits of forestry and the potential it offers at farm, community and national level.

The Broadleaf Thinning and Tending Open Day in Co. Kilkenny on May 20th, for example, was attended by more than 200 farmers as well as participants from the forest sector in general. This event involved the dissemination of the Teagasc/COFORD research on broadleaf silviculture which has been ongoing since the early 90's. The event was a combined effort between Teagasc forestry advisers and researchers and included demonstrations as well as interactive sessions where farm forest owners were able to put the information from the demonstrations into practice.

The Director of Teagasc, Professor Gerry Boyle also launched "Silvicultural Guidelines for the Tending and Thinning of Broadleaves" at this very successful event.





Mapping the location of small forest parcels is key to efficient harvesting and processing.

Mr. Tony Kileen, T.D.and Minister of State at the Department of Agriculture, Fisheries and Food with other visitors to the forestry section of the Teagasc stand at the National Ploughing Championship manned by Teagasc Forestry Specialists Frances McHugh (centre) and Dr. Nuala Ní Fhlatharta (right).

Clustering to help forestry

A total of over 332,000 ha, owned by private individuals or institutions, represents 46% of the total forest cover or 5% of the land area of the Republic of Ireland. Current net roundwood production from privately owned plantations was 118,000 m^3 in 2008, but has the potential to increase to 2.95 million m^3 in 2028.

A large number of small and fragmented plantation sizes providing low volumes, coupled with the high cost of harvesting and timber haulage and the market demand for roundwood and timber products are all significant obstacles to be overcome by the sector.

A 2009 study illustrated the real potential from timber output from small-scale forest plantations through clustering the geographic concentrations of forests. Annual volume production derived from a sample survey of 4,500 ha has the potential to reach over 200,000 m^3 by 2028. Total cumulative volume production will reach 2.06 M m^3 over the period 2009 to 2028. The study provides a template to aid development of local level forecasts and potentially encourage cooperation between growers and industry to achieve economies of scale in harvesting.

Horticulture Development Unit

In 2008, the amenity sector in Ireland was estimated to be worth €67.4 million (DAFF) to the economy. The value of the sector is estimated to have dropped to €43 million in 2009, based on feedback from the sector. Currently, there are 220 commercial nurseries in Ireland which, together with garden centres and the landscaping sector, employ around 3,500 people. Uncertainty in relation to consumers' discretionary spending has impacted on sales in the sector.

The Nursery Stock Conference, organised by Teagasc, in association with Bord Bia, brought together a panel of speakers and industry analysts from The Netherlands, England and Ireland to provide valuable assistance to nursery owners in formulating decisions on how sustainable technologies and practices can reduce their cost base while increasing sales.

'Increasing profits by harnessing sustainable technologies' was the theme for the conference.

Delegates at the conference heard about developing 'green credentials' for their businesses through the Climate Friendly Nurseries Project launched at the conference. They also heard about developing sustainable technologies to keep costs down. It is hoped that increased sales will result from these practices, due to customers supporting enterprises with sound green credentials.

The Horticulture Development Unit works with growers of vegetables, top fruit, soft fruit and mushroom growers as well as Nursery Stock producers. In 2009 two hundred growers were assisted with business plans to support applications for grants under NDP schemes. Other projects include promotion of Integrated Crop Management and bio-control of pests.

A virus disease can turn mushrooms an undesirable brown colour, reducing quality.

Understanding new disease in mushrooms.

Mushroom Virus X (MVX) is a relatively new disease of the cultivated mushroom, Agaricus bisporus, the main symptom of which is an undesirable change in cap colour from white to brown, reducing quality. Genes associated with virus-induced browning were successfully identified by Teagasc scientists using molecular techniques including Suppression Subtractive Hybridization (SSH), micro-array and quantitative reverse transcriptase PCR (Q-PCR) analyses. This work makes a major contribution to our understanding of the etiology of this new disease.

Pigs

The Pig Development Unit in conjunction with the Agricultural colleges at Ballyhaise and Clonakilty established a Fetac Level 6 course for pig production staff. Initially 45 trainees enrolled in the course. It is expected that new courses will be offered in the autumn of 2011 when the present courses have been completed.

The advisory programme continues to be based on benchmarking herd performance based on the PigSys recording system. In addition to the intensive advisory service provided to clients, pig development officers conducted workshops for producers and staff at local centres on key issues such as maximising piglet survival given the substantial increases in litter size recorded.

Pig research at Moorepark focused on nutrition including the work on genetically modified feed ingredients and the effect of low phosphorus diets on bone strength. Pig welfare research examined aspects of the husbandry of entire males and also on causes of lameness in replacement gilts.

During 2009 research work continued examining methods of handling and dealing with the nutrients in pig manure.

The biennial survey of commercial pig production units identified that an investment of about €35 m is likely to be required to comply with legislation in relation to loose housing of sows from 2013.

SHEEP

By the end of 2009 there were six sheep BETTER farms in place three lowland and three upland. The BETTER sheep farms are key focal points in the development of the new ICBF sheep breed improvement programme.

Teagasc advisors and specialists facilitated a total of 33 sheep discussion groups and 173 sheep farmers have completed Profit Monitor analyses.

Adviser Michael Fitzgerald and Michael Doyle who farms near Boolavogue in County Wexford. Mr. Doyle hosted a farm open day in May.

GOAL 1

Improve the competitiveness of agriculture, food and the wider bio-economy

FOOD RESEARCH

Optimising Infant Milk Formula

Infant milk formula (IMF) manufacturers in Ireland contribute significantly to the economic success of the dairy industry by sourcing milk, premium commodity milk powders and added-value dairy ingredients. These highly specialised multinational nutritional companies are crucial to an economy which relies substantially on the export of virtually all of its dairy product outputs.

New technological approaches are being investigated by Teagasc scientists to rehydrate dairy ingredients typically used during IMF processing at high solids concentrate – the aim being to reduce the amount of energy being expended during subsequent spray drying of the formulated mixes.

Novel shockwave heating/mixing technologies which exploit principles from supersonic engineering are being examined to potentially re-engineer infant formula manufacturing processes and make them more efficient. The effects of changing product formulations are being tracked by process mapping in order to guide the selection of optimum conditions. Formulations are also evolving in order to reflect economic e.g. ingredient substitution concerns.

Knowledge on the influence of early dietary programming on obesity development in later years is being generated in a novel in-vitro rheological test which simulates gastric digestion of experimental ingredient matrices and their interactions.

Moorepark's recently established BioFunctional Food Engineering facility is extensively customized for infant milk formula studies and is being upgraded to Good Manufacturing Practice as a step up to process validation and preparation for clinical evaluations.

These facilities are also invaluable for operator training and the provision of post-graduate orientation courses for professionals entering the nutritional beverage manufacturing sector.

Principles taken from supersonic engineering are being considered to re-engineer infant formula says Dr. Mark Fenelon.

Food Structure

The olfactory properties of food are determined by its texture and flavour release and the technological processes necessary for the development of new food products may be guided substantially by modern imaging techniques which track the fate of individual constituents in a product matrix.

Yoghurt is a particular example of a dairy product in which creaminess is a much cherished sensory attribute. At the same time, manufacturers and retailers are responding to consumer demands for reduced-fat varieties of yoghurts. However, fat reduction during preparation of yoghurt milk before fermentation has significant consequences for resulting product texture and mouthfeel as perceived by the consumer.

Since yoghurt milk preparation involves homogenisation and heat treatment, confocal laser scanning microscopy (CLSM) within Moorepark's National Food Imaging Centre (NFIC) has been applied successfully to observe the behaviour of its micro-particle matrix during acid-induced gelation (associated with yoghurt fermentation). Using novel technology e.g. microfluidisation the Moorepark team has been able to show that the resulting low fat yoghurts possess similar creaminess as their full fat equivalents.

Staff Profile

DR. MARK AUTY, SENIOR RESEARCH OFFICER, Food Processing & Functionality Department, Food Research Centre, Moorepark.

Mark is originally from Essex in the UK. He gained an honours degree in Microbiology from Surrey University and worked as a food microscopist for several years before moving to Ireland in 1997 as a researcher in the Food Ingredients Department at Moorepark.

He was awarded a PhD in Food Chemistry at UCC in 2004 and has since coordinated several research projects on food structure and frequently speaks at international conferences.

An example of his research includes a project relating the microstructure of yoghurt with other physical properties to understand how we perceive creaminess. Mark specialises in using imaging techniques such as light, confocal and electron microscopy, to study how food behaves. His expertise is frequently sought by the food industry for various research and development projects.

Recently Mark set up and now manages the National Food Imaging Centre – the first of its kind in the world. This new integrated imaging facility, funded by the Department of Agriculture, Fisheries & Food, provides specialist analysis for the Irish food industry and other academics. Typical industry applications include solving product instability problems and characterising new products.

GOAL 1

Improve the competitiveness of agriculture, food and the wider bio-economy

Better tasting cheese

A project completed in 2009 addressed a number of issues relevant to cheese microbiology and in particular the role of these microbes in the development of flavour and their contribution towards the health benefits of cheese.

A topic of particular scientific and commercial interest involved a study on the contribution of one group of bacteria, Streptococcus thermophilus to the development of Cheddar cheese flavour. S. thermophilus is not traditionally used in the manufacture of Cheddar cheese but in recent years there has been an increasing tendency for it to be included as part of the starter blend as it has proved to be a very robust organism under commercial processing conditions.

Researchers at Moorepark were interested to determine if inclusion of such non-typical bacteria in Cheddar manufacture would have an impact on flavour development. The research undertaken clearly demonstrated that individual strains of S. thermophilus did impact on cheese ripening which manifested itself in flavour modification in particular in medium to mature cheeses.

This research has generated a great deal of interest both from academia and industry with the consequence that a major international food company engaged the Moorepark researchers to test their findings in the context of their leading global brand of mature cheese.

The output of this research has resulted in this international food company revising their guidelines on starter composition for their leading global cheese brand.

Bacteriophages as Biocontrol Agents for Food Pathogens

The primary cause of human infection by E. coli O157:H7 is via consumption of contaminated meat products derived from carcasses contaminated with faecal-borne E. coli O157:H7. A bacteriophage which targets this pathogen in the animal pre-slaughter is being considered as a viable biocontrol option. Phages specific for E. coli O157:H7 have the potential to be used to reduce pathogen numbers in vivo. Researchers in Moorepark have isolated two lytic phages against E. coli O157:H7 from bovine farmyard slurry samples.

In research funded by FIRM, they have demonstrated significant promise for these phages as biocontrol agents. In a model rumen system, the application of specific phages resulted in a rapid decrease in the numbers of deliberately-inoculated E. coli O157:H7 present, with pathogen numbers dropping below the level of detection within one hour of phage administration. Phage application did not effect rumen fermentation, indicating the specific nature of these bacteriophages. Work is ongoing to determine the ability of these phages to reduce numbers of E. coli O157:H7 in the gastrointestinal tract of cattle.

Kieran Kilcawley ascertains odour characteristics of cheese at Moorepark.

Allergy preventing foods

A project completed in 2009 at Teagasc Moorepark involved a multidisciplinary cooperation on the topic of food allergy prevention by factors on farms - particularly in relation to un-pasteurised milk and its related bacteria. This is based on previous observations that children with a history of drinking farm milk in the first year of life with a specific genotype experienced less allergy compared with children not drinking farm milk in the first year of life.

Follow-on research at Moorepark is aiming to uncover constituents present in raw milk that have a direct effect on the immune system and, more specifically, are related to asthma development later in life.

Such ingredients should not only improve consumer health but also present industry with an opportunity to develop Functional Foods targeted to a whole new group i.e. those with a family history for development of the disease.

Given the growth which is occurring in this food sector and the projections for the future, we expect that ingredients which carry a health claim such as reduction in risk of asthma development will contribute a competitive advantage to the Irish Dairy Industry in the future.

Blown pack spoilage

Blown pack spoilage (BPS) is a well known problem and a major cost for the Irish beef industry. It is caused by cold-loving Clostridia, specifically Clostridium estertheticum, Clostridium gasigenes and other species and occurs in correctly chilled batches (0 to 2°C) after 2 to 4 weeks. As spoilage is characterised by the production of large volumes of gas, a putrid smell (H_2S) and a metallic sheen on the meat, meat spoiled in this way has no commercial value. Much work has taken place at Teagasc Ashtown to further understand the causes of spoilage and to assist in control and detection.

Food Research Centre Ashtown discovered a new Clostridial species capable of causing BPS. This new species is more common in Irish abattoirs and spoils meat relatively quickly. Genetic analysis of this strain revealed a target gene sequence forming part of the gene encoding the 16s ribosomal RNA which is capable of specifically detecting the presence of this bacteria to the exclusion of all other Clostridial species and other spoilage bacteria.

An RT-PCR assay was developed, validated using primers and probes designed using this sequence and the novel strain and resulting assay patented.

As this assay is specific to the novel strain discovered and shown to be the primary cause of BPS in Irish abattoirs, it offers the advantages in terms of precision and time associated with real-time PCR but also as the detection of all three causes of spoilage is now possible, it makes this test more useful than previous methods.

Testing of meat samples using this unique service will allow meat companies to assure product quality, validate in-plant decontamination activities and investigate the cause/source when a BPS incidence occurs. Results would be expected back in two working days.

"Blown pack spoilage is potentially a huge industry problem. Teagasc Ashtown have made a good start but a lot of work still needs to be done."

Dan Galvin, Dawn Meats.

EDUCATION

The amalgamation of the staff, students and horticultural training programmes at Warrenstown Horticultural College was completed on 29th June 2009. A total of 21 staff transferred into Teagasc with 14 relocating to the College of Amenity Horticulture at the National Botanic Gardens and Kinsealy. The balance of seven staff were transferred to other priority assignments in Teagasc.

A total of 155 students also transferred to the College of Amenity Horticulture and their existing programmes are being continued in the Botanic Gardens/Kinsealy.

Three lead colleges namely, Kildalton, Ballyhaise and the Botanic Gardens were established along with 12 Regional Education Centres. The Regional Education Centres have a total of 32 Education Officers and are reporting to the two newly appointed Education Managers, one North and one South.

Following adoption of the Teagasc Change Programme, funding for the three remaining private colleges is assured for two academic years commencing September 2010.

During 2009 agreement was reached with six Institutes of Technology regarding payment to Teagasc for service delivery at a rate of €100 per hour plus a 40% overhead charge.

The joint programme between Institute of Technology Blanchardstown and the Botanic Gardens/Warrenstown was discontinued in 2009 and will be replaced by a Level 8 Horticultural Degree Programme in conjunction with Dublin City University.

The new Dairy Degree Programme developed jointly by Teagasc and UCD commenced in September 2009 with 15 participants. These students will spend part of the programme at Moorepark and Kildalton with practical learning periods spent in New Zealand.

The new Leadership Module which was developed in conjunction with Macra Na Feirme was rolled out in all college-based courses.

Young Entrant Training

Enrolments in colleges increased again in 2009 by 4% compared to 2008 which represents a 76% increase since 2006. All colleges are at full capacity with two colleges, Kildalton and Mountbellew, not able to cater for all of the applications.

Further education programmes were delivered at seven colleges and at Regional Education Centres in Agriculture, Horticulture, Horse Breeding and Training and Forestry. Specialised Advanced Courses were also provided in Dairy Herd Management, Machinery and Crop Management, Drystock Management and Agricultural Mechanisation.

A total of 809 students enrolled in 2009 in further education programmes at colleges while the total overall number participating in these programmes was 2,180.

Left: Lecturer Joe Day with students at Teagasc Kildalton.

Teagasc also delivers 11 higher level education programmes in conjunction with various higher level institutions. These programmes include Agriculture, Horticulture, Agricultural Science, Agri-business ,Equine Studies and Agricultural Mechanisation. A total of 279 students enrolled in higher level programmes in 2009 while the total overall number participating in these programmes was 1,042.

Participants in further education programmes can transfer into higher level courses if they achieve a merit or distinction and all higher level students can progress to level 8 (Honours Degree Level) on the National Qualifications Framework and beyond. In 2009, 94 students progressed from further level programmes to higher level programmes.

Adult Farmer Education

In addition to the full-time courses at colleges there is also a comprehensive programme of Advanced Certificate in Agriculture for part-time farmers held throughout the country in Regional Education Centres. These courses are held largely at night and weekends in order to facilitate part-time farmers. The syllabus is the same as the full-time courses and the courses are generally 2 to 3 years duration. During 2009 a total of 15 courses were underway with a total of 459 participants.

Of these courses five were first year courses with a total of 187 enrolees. A further 345 part-time farmers also participated in the Advanced Certificate in Agriculture (Level 6 Award Holders).

Above: Paddy Browne, Director Gerry Boyle, Minister Brendan Smith, T.D. and Tom Kirley at the opening of the new Education Facilities at Kildaton.

These courses replaced the old 180 hours courses but are much more comprehensive in nature following the Forum Review of Teagasc's education provision. Fifteen such courses were held during 2009 with a total of 345 participants. Four of these courses are a combination of conventional learning and online learning.

This form of blended learning is now recognised as an excellent educational methodology.

A further 274 part-time farmers also completed an on-line version of the Advanced Certificate in Agriculture (Level 6 Award Holders) through the Teagasc eCollege.

In summary, when all of the various programmes for future farmers outlined above are combined, the total number of new enrolees amounts to 1,577 and the total numbers participating in these programmes amounts to 3,222.

A further 10,800 adult farmers completed short training programmes which were delivered in conjunction with the Advisory Service. The biggest categories were the REPS training courses with 3,000 participants and Health and Safety training programmes with 3,500 participants. In addition, adult modules were also delivered in Technology and Business, Rural Viability, Forestry, Alternative Enterprises, Information Technology and Pesticides.

Level 5 programmes

Budgetary cutbacks were implemented in 2009 including the discontinuation of placement subvention and the introduction of a fee of €130 for all further level students. Level 6 ACA discussion groups, in conjunction with benchmarking farms, were further rolled out in 2009 with a total of 40 discussion groups and 40 benchmarking farms. Practical Learning Periods (replacing placement) were arranged for 1,118 students and 167 new master farmers were recruited.Verification of qualifications and letters of equivalence were issued to 534 Teagasc course participants.

Fifteen trainees satisfactorily completed the Special Needs Programme. A total of 2,651 participants in Teagasc programmes were put forward for FETAC awards in 2009. This comprised 1,288 Major Awards, 375 Special Purpose Awards and 988 Minor Awards. 12 career events were held at colleges with a total attendance of 2,020.

Staff Profile

LIZ DUFFY
Discussion group facilitator within the Teagasc/Dairygold joint programme.

Originally from north county Dublin, Liz graduated from UCD in 1994 with a BAgrSc degree specialising in environmental science. After working for a year on REPS with a private consultant in Co. Meath she moved to Cork and completed a PhD before working as a contract research scientist in the Department of Zoology, Ecology and Plant Science, UCC.

Liz joined Teagasc in 2001 as REPS planner based in the Moorepark Advisory Office in Fermoy. In September 2007, with the renewal of the joint Teagasc/ DairyGold programme she moved to her current position.

"Along with my advisory colleagues we co-ordinate and run 27 discussion groups per month under the umbrella of the joint programme," said Liz. "In line with the aims of the Dairy Efficiency Programme we transfer the most up to date technology and research onto dairy farms. Grassland management, breeding goals and financial management are the focus as they are the key to ensuring sustainable family farm businesses."

ADVISORY ACTIVITIES

A difficult year.

Due to increased price volatility for agricultural produce farmers faced significantly reduced sales receipts in 2009. The prices paid to farmers for milk and grain fell, while beef and sheep farmers faced a price-cost squeeze due to an increase in farm input costs in recent years.

A financial planning service "Financial Health Check" was provided by Teagasc advisers to farmers at their annual consultation to assist in filling out their Single Farm Payment application form before the 15 May deadline.

Teagasc doubled the number of applications submitted online for the Single Farm Payment (SFP) on behalf of farmers.

In a move to reduce errors and speed up the processing of applications in the Department, Teagasc advisers have increased the use of on-line applications. In 2008, 25 per cent of all SFP applications submitted through Teagasc were done online, this doubled to 50 per cent in the application period to May 2009. Almost 20,000 applications were submitted online by Teagasc and advisers have found that the system has helped to reduce the paper volume and the risk of simple errors.

Despite this busy scheme application period, a full schedule of advisory events were maintained by the Teagasc Advisory Area Units around the country, to ensure farmers had access to the best business and technology advice during the critical spring period. Extended periods of heavy rain and a cold spring further exacerbated the challenge for livestock farmers who faced dwindling winter feed stocks as some animals were re-housed in spring to avoid sward damage. Teagasc provided additional advice on managing feed supplies and reducing poaching through techniques such as on-off grazing.

Business and Technology	Dec 2009
No of Contracted Clients	
Dairy	8,545
Drystock	4,164
Tillage	1,846
No of Discussion Groups	
Dairy	240
Drystock	
- Cattle	77
- Sheep	33
Tillage	22
No of Monitor BETTER Farms	
Dairy	80
Drystock	24
- Cattle	18
- Sheep	6
Tillage	3

Environment and GFP	Dec 2009
No of Contracted Clients receiving Environmental Services	42,090
No. of REPS Clients	29,300
No of REPS Plans	6,459
Derogation Clients supported	1,800
New Plans	221
Biodiversity /Nutrient Use Efficiency Events	24
Nitrates Cross Comp Events (in co-operation with DAFF)	32
Rural Development	32

Rural Development	Dec 2009
No. of clients participating and planned in the options programme	1,950
No. of farm families referred to Education programmes	742
No of Alternative Enterprise Public Events (Organic, Equine, Artisan Food & Rural Tourism)	70

"Abigail has certainly improved the finances of my business, my costs per hectare are down and my profits are up."

Galway dairy farmer Noel O'Toole talking about his work with Teagasc adviser Abigail Ryan.

Business and Technology Programme

BETTER farm projects have been established and set up for beef and liquid milk; three tillage BETTER farms established. There is a continuation of the grass budgeting circle approach and the establishment of grass measurement for all dairy advisers.

The BETTER beef farms are being used to promote grassland management and budgeting on drystock farms. These are ongoing in the Dairygold mastitis programme. An integrated programme has been established with Glanbia to resolve quality issues on dairy farms.

Specialist Pat Clarke demonstrates grass covers at the Moorepark open day in 2009.

Environment and Good Farm Practice Programme

A total of 5,400 new REPS 4 plans were delivered to clients in 2009 to the end of May. Teagasc assisted about 1,800 clients to meet their commitments (e.g. records) under the nitrates derogation. GFP programme was evaluated and refocused as Environment & Technology (E&T) programme. Technical advice is being provided to 34,000 contracted clients in the E&T programme.

Rural Development Programme

A strategic review of the Rural Development Programme was initiated early in 2009. The main focus will be on organic enterprises, alternative farm and off-farm enterprises and the Options programme.

Adult Education Programme

Modules on internet, grass budgeting, financial competency developed and updated. Crops nutrient management course developed and FETAC accredited.

Public Website

The Advisory Service launched an upgraded public website for its Area Units. The website provides the latest advice and information to farmers online. The site contains details and activities of each Area Unit, combining information on national advisory programmes tailored to meet the specific requirements of farmers locally.

Fintan Phelan and other Teagasc staff provided focussed support to farmers in the difficult financial conditions which prevailed in 2009.

The site is available to the general public and gives details of the staff working in the individual units, upcoming public events, education courses, monitor farms and the BETTER Farm Programme. It also outlines the full range of services Teagasc provides at local level. The site contains links to client newsletters as well as links to other sections of the organisation.

New Farm Business Planning DVD

A new Farm Business Planning DVD produced in association with the Farm Apprenticeship Board will be used as part of Teagasc's education courses and with farmer clients. The DVD outlines in an easy-to-understand manner the steps involved in farm business planning. It emphasises the use of computer applications such as the Cost Control Planner, eProfit Monitor, Farm Business Planner and other farm software packages; all of which are available from Teagasc. The DVD's mix of farmer interviews and case studies also provides clear messages for the viewer.

Limerick farmer Sean Kearney and Advier Stuart Childs.

GOAL 2

Support sustainable farming and the environment

teagasc
Agriculture and Food Development Authority
www.teagasc.ie

GOAL 2

Support sustainable farming and the environment

High Nature Value Farmland

As part of the post-2013 Common Agriculture Policy, there will be a strong emphasis on the use of payments to ensure the supply of public goods from agriculture; halting biodiversity loss will be a strong component of this. To help meet targets aimed at halting loss of biodiversity the European Commission already requires all EU Member States to prioritise the identification, support and maintenance of High Nature Value (HNV) farmland and forestry in their current Rural Development Programmes.

The objective is to use rural development measures to preserve and develop HNV farming and forestry systems. A Teagasc Walsh Fellow conducted a survey of habitat number, area and quality in parts of east Galway where no formal habitat designations (e.g. Special areas of Conservation) are in place.

The 603 fields in a random sample of 32 farms recorded an average of 2.6 semi-natural habitats per farm, with an average area of 15.2% of the farm; only three farms had no semi-natural habitats and more than 40% of the farms had three or more semi-natural habitats. There was a clear gradation from low species richness (~ 12 species per field) to higher species richness (~25 species), with a very obvious intermediate semi-improved group (~17 species).

The national guide to habitat classification fails to identify this intermediate group. This gradation from improved to semi-natural grassland highlights the biodiversity variation that occurs on farms that are frequently considered to be of low nature value.

Hen Harriers, an indicator of High Nature Value Farmland. (picture Barry O'Donoghue, NPWS)

The detailed description of the grasslands that occur on these lowland farms has the potential to provide a better assessment of the overall nature value of a farm, potentially aiding the identification of Type 2 High Nature Value farmland. Before this can be achieved, however, there is a need to amend the grassland classification system used in Ireland in order that intermediate semi-natural grassland assemblages can be identified at the field level.

Agricultural Catchments Programme

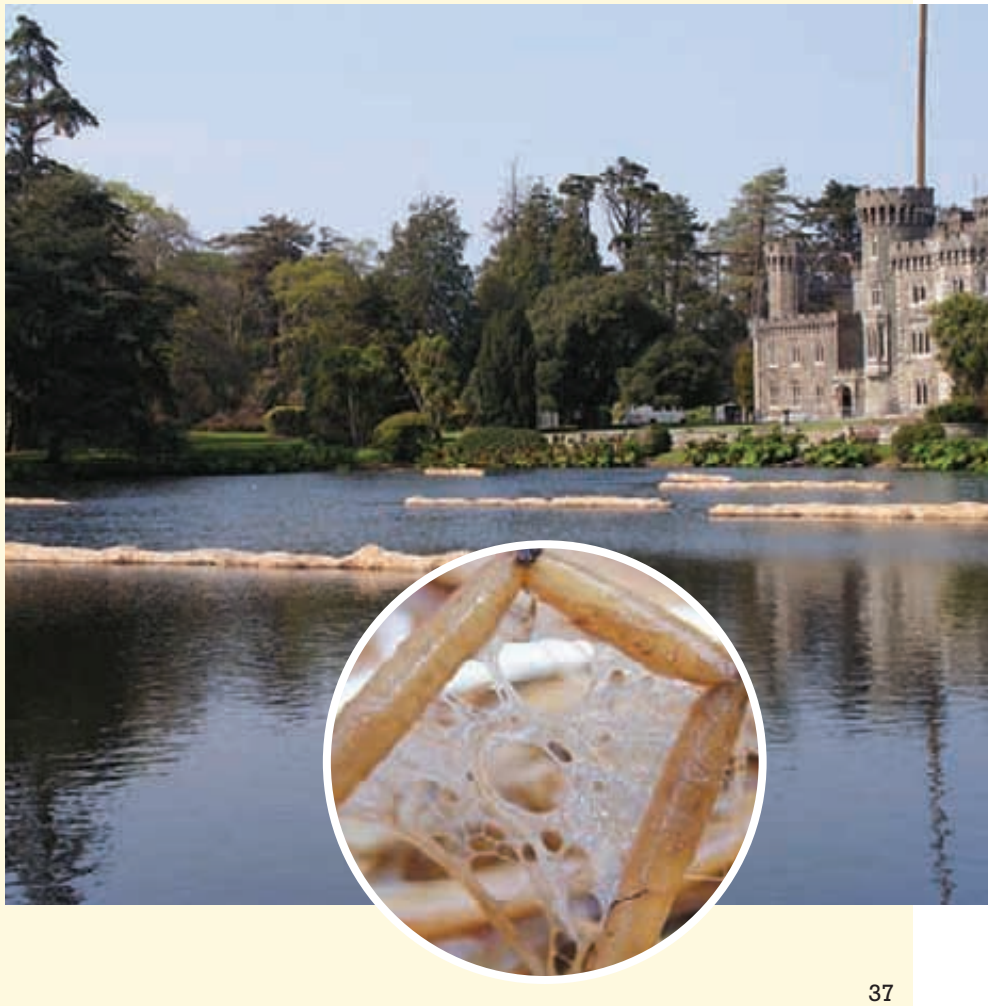
Following a rigorous selection process five agricultural catchments were established during 2009. This entailed the consultation and briefing of all landowners by programme advisers and once agreement had been reached the installation of the physical infrastructure began. This consists of an automated, high-resolution bankside analyser, hydrometric station and weather stations in all catchments and groundwater monitoring wells in the two most free-draining catchments. Soil sampling (2ha/sample) was completed on approximately 80% of the land and preparatory work for attitudinal and financial surveys was begun. The programme advisers and technicians worked closely with the farmers providing advice, collecting data and facilitating the research programme. The excellent level of farmer support has contributed enormously to the success of the programme to date.

Members of the Agricultural Catchments Programme team pictured in the Castledockerell catchment in Wexford: From left; Dr. Per-Erik Mellander, Environmental Hydrologist, Dr. David Wall, Soil Scientist, David Ryan, Technician, Ger Shortle, Programme Manager, Dr. Alice Melland, Hydrogeochemist, Prof. Phil Jordan, Principal Scientist, Eddie Burgess, Agricultural Adviser.

Barley to prevent eutrophication

Chemicals released from rotting barley straw have been shown, in some cases, to inhibit the growth of algae in fresh water. Scientists at Johnstown Castle have used rotting barley straw to prevent algal growth which can result in eutrophication and reduced oxygen levels in water which is detrimental for fish and other species.

Defining a protocol for research in this area is essential as results have often proved inconclusive due to varying methodologies etc. The Johnstown Castle researchers have defined an approach which should result in greater repeatability of results and more effective use of this highly innovation technique to aid environmental protection.



Barley straw in the lake at Johnstown Castle helps prevent eutrophication.

Animal welfare index (AWI): an on-farm survey on beef suckler farms.

Teagasc researchers examined the welfare status of Irish beef suckler herds using an animal welfare index (AWI) to determine the influence of the stockpersons' status fulltime/part-time, their interest in farming and herd size.

Beef suckler farms (196 throughout 13 counties) were assessed, once with housed cattle and once with cattle at grass, using the AWI. Twenty-three of the 196 farms were revisited a year later and re-evaluated using the AWI.

Thirty-three indicators were collected in five categories: locomotion, social interactions, flooring (5), environment (7) and stockpersonship (9). Three indicators relating to the size of the farm were also collected. The mean AWI was 65% and ranged from 54% to 83%.

The grazing period represented 16.5% of the total points of the AWI. Seventy percent of the farms were rated as "Very Good" or "Excellent". There was no difference ($P > 0.05$) in AWI between full time and part time farmers.

A hierarchical classification was performed to examine how the indicators influenced the AWI. Key factors influencing the Animal Welfare Index were the interest of the farmer (higher scores when the farmer was more interested in farming) and the number of animals (higher scores when the herds were smaller).

Healthy beef

Beef is often regarded as a high-fat food containing a high proportion of saturated fats that could be dietary risk factors for cardiovascular disease. However, grass-fed beef contains conjugated linoleic acid (CLA) a particular fatty acid that is considered beneficial for human health. Enhancing the nutritional value of beef by increasing the concentrations of this fatty acid to a level that is demonstrably beneficial to human health will help to increase beef consumption.

Teagasc researchers have developed strategies to increase the concentration of "healthy" fatty acids in beef, with a focus on CLA. However there are marketing challenges to the full exploitation of the findings.

For example, the concentrations of CLA currently achievable with dietary modification of cattle rations are not sufficient to attach a health claim to unprocessed beef. Also, because of the variation within a group of similar animals, a rapid on-line assessment of the concentration of CLA (and other beneficial fatty acids) is needed to allow industry to sort carcasses into different product streams early post-mortem.

"The farmer plays a key role in animal welfare," says Teagasc adviser Richard O'Brien.

In future, breeders will be able to breed replacements with enhanced resistance to TB.

Breeding for resistance to bovine tuberculosis

In 2006, a three year ERAD funded project began at Teagasc Moorepark to determine whether susceptibility to bovine tuberculosis (bTB) was under genetic control and also to quantify the impact of current breeding programs on susceptibility to bTB.

The data originated from two sources: 1) results of the tuberculin test on the neck of the animal during the annual TB test, and 2) incidence of lesions at slaughter. Data on over 15,000 Holstein-Friesian cows were used. Results showed that at least 12 to 18% of the differences in susceptibility to bTB was due to the DNA the animal receives from its sire and dam.

Further investigation revealed that selection for increased production, particularly fat yield, will increase susceptibility to bTB although selection for increased survival, also part of the economic breeding index (EBI) in dairy cattle, will increase resistance to bTB. This is the first large study internationally to show that susceptibility to bTB is under genetic control and quantify its association with performance.

National Farm Survey

Results from the 2008 National Farm Survey showed that average Family Farm Income (FFI) declined from €19,687 per farm in 2007 to €16,993 in 2008 - a decline of 13.7%. The decline resulted from an increase of 13.8% in costs of production. The decline of 13.7% in FFI in 2008 following an increase of 18% in 2007, and show the volatility in farm incomes following decoupling of direct payments compared to the relative stability in the previous decade of coupled payments and EU product price supports mechanisms. The income on full-time farms declined by 14% in 2008 to €37,590.

As in previous years dairying generated the highest returns, with an average income of €45,730 per farm compared to €9,600 and €7,700 per farm on sheep and beef rearing farms respectively. Changes in farm income ranged from minus 52% on the Mainly Tillage System to plus 5% on the Cattle Other farms and minus 10% on Mainly Sheep farms.

There was a decline of 24% and 10% in FFI respectively on the Dairying and Other and Specialist Dairying Systems.

Nationally average direct payments increased by 6% from €16,524 per farm in 2007 to €17,468 in 2008. In 2008 direct payment and subsidies contributed 31% of Gross Farm Output but for the first time in the history of the NFS, total direct payments actually exceeded Family Farm Income by 2.7% viz total direct payments of €17,468 compared to FFI of €16,993. The predominant reason for the change from the 2007 year, when direct payments contributed 84% to FFI, was the decline in the contribution of market output to total gross output due to decline in milk and cereal prices in 2008.

Drs. Anne Kinsella, Liam Connolly and Cathal O'Donohue of the Teagasc Rural Economy Research Centre.

GOAL 2

Support sustainable farming and the environment

The highest ever investment in new farm facilities took place in 2008, encouraged by grant aid available under the farm waste management scheme, with a massive €2 billion invested in new buildings, machinery and other on-farm facilities. This came on top of a €1.4 billion investment in 2007 and brings the cumulative investment by Irish farmers in new facilities to €4.5 billion in the three-year period 2006 to 2008.

Nine out of ten dairy farmers invested new capital in their businesses last year, whilst half of cattle and sheep farmers have upgraded their facilities.

The average gross investment per farm in 2008 was €19,480, equivalent to 115 per cent of the average farm income and the highest level recorded in the National Farm Survey series. These investments have led to an increase in farm borrowings in 2008, up by a total of €500 million nationally on the previous year. The largest increase in borrowings took place on full-time, specialist dairy units.

For the first time since the mid 1990s, the percentage of farms where the holder and/or spouse had an off-farm job declined from 58 per cent in 2007 to 56 per cent in 2008.

This obviously reflects the employment difficulties in the wider economy and is a worrying development given the proportion of part-time farmers in the sector and the importance of off-farm income to farm households. The National Farm Survey also shows the importance of other sources of income, such as pensions and social assistance to family farm income. In overall terms, on 8 out of 10 farms the farmer and/or spouse had some source of off-farm income be it from employment, pension or social-assistance.

Farm Partnerships and Share Farming

The average farm size in Ireland is small, relative to our competitors in countries such as New Zealand, Australia, South America, the US and Canada, and the full benefits of advances in mechanisation and technology can only be reaped by increasing the average acreage farmed. Joint farming agreements can also reduce isolation by bringing social contact into the workplace and by freeing up time for farmers' social activities.

Share farming is a joint venture between two separate farming businesses where two people, a land owner and a share farmer, jointly farm the same area of land as separate enterprises, remaining separate and independent for accounting and tax purposes.

A Teagasc specialist is now providing information and assistance to farmers who wish to look at partnerships or share farming as an option to increase scale or improve economic and social viability for the future.

STEPHEN ALEXANDER
Horticultural Development Officer.

Stephen Alexander grew up in Tallaght when it was a rural backwater in south county Dublin. He spent two years in the National Botanic Gardens from 1972-1974 and was awarded a scholarship to UCD where he did a degree in Agricultural Science taken in Horticulture. He was in the last year to attend the Albert College, from where he graduated in 1978.

Stephen's role is Horticultural Development Officer specialising in vegetable crops and he is part of the Horticultural Development Unit, which comprises everyone within Teagasc involved with horticultural research and advice. Stephen is based at Kinsealy Research Centre, and services growers in the east Leinster area.

"I provide a technical back-up service to the vegetable industry, keeping growers up-to-date with the latest in vegetable production technology," says Stephen.

"There's been a terrific upsurge of interest in people growing their own food and to service this market in 2009 I wrote a booklet entitled 'A Guide to Vegetable Growing'." This booklet generated considerable interest, with several thousand copies provided to members of the public. The booklet is in its third edition.

GOAL 2

Support sustainable farming and the environment

The designer pellet

The biofuel characteristics of new energy crops are being assessed at Oak Park. While larger premises such as hospitals and businesses can use biofuel chips for heat, home-owners need the more dense and uniform 'pellet' to fuel domestic burners. Pellets are typically made from forestry thinnings of which there is a limited supply.

The feasibility of producing pellets from new feedstocks such as straws and energy crops was investigated in 2009.

The Oak Park research found that good quality pellets could easily be manufactured from willow, Miscanthus and rape straw. Cereal straw proved quite difficult to pellet. Pellets were also successfully manufactured from a mixture of feedstocks which allows a designer pellet with good charcteristics to be produced. Combustion tests indicated that mixed feedstocks may be required to produce a satisfactory emission profile.

This research is now being continued at Oak Park as part of a European project with the aim of developing low emission combustion systems.

Economic impact of climate change

The major objective of this study conducted by the Teagasc Rural Economy Research Centre (RERC) was to determine how climate change will affect agricultural production in Ireland and in turn to examine the implications for Irish farmers. The first stage of the analysis developed growth models to ascertain the effect of different climate scenarios on the growth of various crops. In the second stage of the analysis farms were categorised according to their location, management practices and characteristics in order to determine the impacts of climate change on different farm types.

The aim was also to examine possible farm adjustments on these farms to exploit positive effects and to minimise the adverse effects of climate change. While the effects of climate change differ by farm type and location, the major high level result of the project was that all livestock farm types could maximise profit by exploiting increased grass production, reducing concentrate feed and increasing silage production.

However, earlier turn out to grass is not likely to be a feasible strategy, except in the South West region, as it is estimated that grass yield in the other regions will not be sufficient.

Miscanthus being harvested at Teagasc Oak Park.

Tillage farms suffer most under climate change because cereal yields are estimated to decrease in all regions. It may be profitable for some farmers to substitute the energy crop miscanthus for the cultivation of some of the more conventional crops.

New targets in plant breeding

The ability to deal with a range of stresses is now an important target in plant breeding. Oak Park, Crops Research Centre have been collaborating with colleagues at the Scottish Crop Research Institute (SCRI) to apply cutting edge transcriptomics and metabolic profiling approaches to understand the responses of perennial ryegrass to a range of stresses.

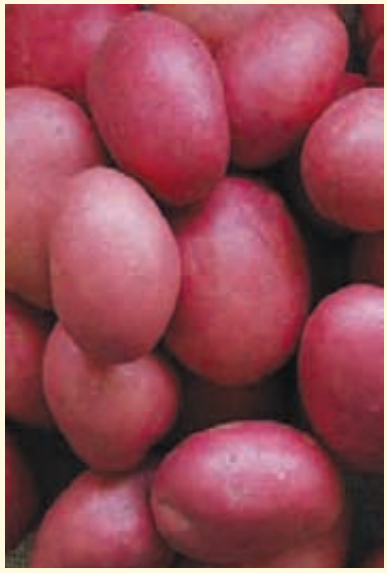
Several significant findings have been made in this research programme regarding the response of perennial ryegrass to stresses including phosphorous deficiency, drought stress and selenium toxicity.

Other work revealed that drought-tolerant perennial ryegrass varieties respond to water stress by increasing sugar production in the plant, implying that increasing the ability of perennial ryegrass to accumulate these sugars in response to water stress may lead to more tolerant varieties. Understanding the way in which perennial ryegrass responds to these types of stresses will be a key factor in developing new varieties which can adapt to our changing environment in the future.

Potato and Grass breeding

Crop breeding at Oak Park continues to consistently deliver varieties with improved quality and/or yield traits. Two new potato varieties were released in 2009. Infinity and Cristina are both red skinned, white fleshed, early maturing varieties with excellent skin finish and uniformity. Infinity has high dry matter and is suitable for both the fresh market and processing into crisps. Cristina has lower dry matter but has shown excellent potential for all pre-pack markets due to its exceptional appearance, uniform size and waxy texture.

In 2009, five new varieties of perennial ryegrass were submitted to the official National/ Recommended List trials in Ireland and other countries. Two new varieties were awarded Recommended Listing. Genesis (early diploid) and Solomon (intermediate diploid) are ideally suited to Ireland's grazing based livestock systems offering exceptionally high spring and annual grazing yields. In addition, new markets were developed for existing white clover varieties, Avoca and Chieftain, in France and New Zealand.



Scientists from the Potato Genome Sequencing Consortium meeting at Teagasc Oak Park.

Genomics-based breeding of potatoes

The first publicly available draft sequence of the potato genome was released in September 2009 by the Potato Genome Sequencing Consortium (PGSC), a group of 16 research groups from all over the world (www.potatogenome.net). The biotechnology programme at Oak Park made significant contributions to this in terms of both traditional Sanger sequencing and Next Generation Sequencing, and continues to be active in the project in the areas of genetic mapping, quality control and resistance gene identification. Currently, the information from the PGSC initiative and similar sources is being exploited in a novel experimental potato breeding programme at Oak Park, where an approach based heavily on molecular marker assisted selection is being used to rapidly develop advanced potato breeding material exhibiting resistance to multiple pathogens including late blight, viruses and potato cyst nematodes, making it one of the most progressive commercial potato breeding programmes in the world.

Muck and money

The old adage that where there's muck there's money has been shown to be true in the case of pig slurry on arable farms. The results of work at Oak Park have indicated that 50% of the nitrogen in pig slurry can replace fertilizer nitrogen for spring barley. The work also demonstrated that slurry can be used to replace phosphorus fertilizer. This means reduced fertilizer costs for arable growers while at the same time providing an outlet to pig producers for their slurry. However the necessity of incorporating the slurry soon after application can cause logistical issues in the field. The results of the work have been highlighted to growers who have now begun to view pig slurry as a valuable source of nutrients.

International White Clover Conference

Fertilizer costs on grassland can be substantially reduced by replacing nitrogen chemical fertilizer with nitrogen fixed by white-clover. Teagasc researcher James Humphreys speaking at an International Conference held at Teagasc Moorepark said: ''Our research has shown that well managed clover-based swards can supply up to 140 kg/ha of N each year at little cost.

Teagasc is investigating new methods of analysis and the collection, archiving and distribution of spatial data.

Another benefit of clover-based pastures is higher quality, especially under low nitrogen input systems.'' The two-day event brought together some of the leading grass-clover agronomists in the world.

Clover sowing dates

A grassland study examined the early growth and development of seedlings of contrasting pasture species after autumn sowing. Results suggested that the growth and development of individual pasture species need to be considered when making decisions on time of sowing and composition of pasture seed mixtures. Red clover cultivars can be sown in autumn with perennial ryegrass. In contrast, spring sowing of Caucasian clover in seed mixtures that do not include perennial ryegrass or red clover should be recommended.

Regrowth intervals.

A nutrition study at Teagasc Grange examined the effects of increasing grass regrowth interval (RI) on intake, rumen fermentation, in situ degradability, rumen digesta kinetics and nutrient flow to the omasum in beef cattle. The results indicate that increasing the RI of a perennial ryegrass-based sward by 10 days (28 vs. 38) had no adverse effect on feed intake, rumen fermentation or digestion, but reduced ammonia N levels in the rumen, potentially reducing nitrogen excretion to the environment.

National Spatial Data Archive

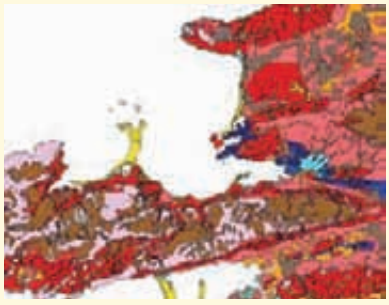
In line with the government's objective of establishing an Irish Spatial Data Infrastructure - an initiative led from the Department of the Environment, Heritage and Local Government- the National Spatial Data Archive (NSDA) will be a dynamic repository for a diverse range of spatial data relevant to the ongoing research programme in Teagasc and the wider research community.

The Teagasc research programme under development in the spatial analysis area is building a platform for a new approach to complement existing environmental, economic and rural development research. New methods of analysis and the collection, archiving and distribution of spatial data on issues affecting the agri-food industry and the rural economy need to be developed.

Spatial analysis within Teagasc needs to be addressed in the context of external legislative drivers at both European and national level as well as internal drivers towards increased efficiency and quality output. The establishment of the National Spatial Data Archive will address these drivers for change and will provide a platform for the corporate adoption of geospatial data analysis and archival techniques into mainstream research processes.

Soil resources

Teagasc Environment Research Centre, Johnstown Castle, County Wexford hosted a three day conference, organised jointly by the British Soil Science Society and the Soil Science Society of Ireland in September which brought together some of the leading soil scientists in the world. In Ireland, over 400 different soil types have been identified so far, each with its own suite of soil functions. To date, soil functions have rarely featured in spatial planning; the conference heard a key-note presentation from Henk van der Kamp, former president of the Irish Planning Institute, on how we can get more value out of our national soil resources if we take account of which soils can produce most food, which can sequester more carbon, and which have the best capacity to purify water.



Soil map of parts of County Kerry.

GOAL 3

Encourage diversification of the Rural economy and Enhance the Quality of Life in Rural areas

teagasc

Agriculture and Food Development Authority
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GOAL 3

Encourage Diversification of the rural economy and enhance the quality of life in rural areas

Options

The Options Programme promotes whole farm appraisal and work/life balance. The programme has vast potential to empower farm families to analyse and evaluate the family situation. The programme is implemented by all advisers across all Advisory Area Units. Almost 2,000 plans were produced. These plans identified, with the farm families, where change and efficiencies would be beneficial. They also provided links to specialist services in Teagasc and to other agencies such as LEADER, County Enterprise Boards, FÁS and Vocational Education Committees.

Of the 1,950 farm families for whom Option Plans were prepared advice and intensive guidance was provided as follows:

– 26% technical farm management
– 23% schemes
– 23% financial management
– 8% workload
– 6% succession
– 6% diversification
– 4% off farm employment
– 4% farm safety

This intensive advice encompassed complete change of enterprise, expansion or reduction in enterprise. Diversification included forestry, rural tourism, equine, organics, poultry, other farm and off-farm measures.

Farmers Jenni and Pat McNally pictured with Carol Griffin (right) of Teagasc Ashtown sell their produce direct to consumers.

Organic production

The market in Ireland for organic produce is now worth €104 million per year. The market in Europe is worth over €16 billion with the largest sales in Germany, the UK, France and Italy. Organic produce enjoys a high market share in countries like Denmark, Austria, Switzerland and Sweden.

Just over one per cent of the land area in Ireland is devoted to organic production by 1,100 farmers, which is less than the average of five per cent of EU land area used for organic production. Government policy is to increase organic food production to five per cent by 2012. The organic team of four advisers maintained the momentum of the previous year in promoting the agenda of increased organic production.

Nine Level 5 FETAC courses were delivered across the country on Introduction to Organic Farming.

There were 20 public farm walks on demonstration farms. This is an ideal way for prospective organic farmers to see models of organic production with every possible enterprise covered.

National Organic Production Conference in April had 200 in attendance.

- 210 Farm Visits were made
- 63 Organic Conversion plans were completed
- 4 Regional seminars were held

A discussion group proved to be beneficial and informative for all participants.

Farmers attend courses in processing their own produce at Teagasc Ashtown.

Equine Husbandry

Teagasc equine specialists delivered the equine input into a range of Teagasc courses including those at Fetac level five and six. In addition the equine team delivered a wide programme of support to the equine industry including farm visits, lectures to students at a range of (non Teagasc) educational institutes across the island.

The equine team also provided demonstrations at Equestrian Centres and stables across the country. Young breeders are key to the future of the industry and the equine team facilitated demonstrations aimed specifically at young breeders.

A highlight of 2009 was the Young Breeders World Championship which took place at Teagasc Kildalton with huge input from the equine team and staff at the college. Teams of young people from across the world attended.

Participants at the Young Breeders World Championship which was held at Kildalton in 2009.

Bernadine and Jimmy Mulhall who farm at Cooleanowle, Co Laois, process their own organically produced livestock into meat cuts but also sausages. Jimmy has worked with Paddy Ward of the Teagasc Food Research Centre, Ashtown.

Artisan Foods

Teagasc artisan food experts are assisting clients in the areas of sea salt production, farmhouse crisps, confectionery, baby food, yoghurt, cheesecakes, ice cream, liquid milk, cheese, chocolate, meat products including direct farm sales and box schemes.

The specialists have attended events such as Farmfest08, Terre Madre, Taste of Cork, Taste of Kildare, Galway Food Forum, Food workshops and liaised with Leader, Skillnets, Udaras, CEB's, College's, EHO's, FSAI, Failte Ireland. Staff provided in service training for our six R/T colleagues.

One to one mentoring visits, local and national radio interviews, press articles, talks at workshops and conferences and provision of training throughout the country formed the other areas of activity.

Rural Tourism

The tourism industry is worth €6.3 billion annually, of which €4.8 is foreign earnings. Rural tourism embraces the broad spectrum of accommodation and activities. It includes farmhouses, town and country homes, self catering houses, apartments, fishing lodges, forest homes, caravan /camping sites, stately homes along with the many rural activities.

Regional seminars on tourism and food were held in three centres with attendance of 350. Workshops and courses were run in three centres with attendance of 75. A national rural tourism and food conference had 150 in attendance. The rural tourism challenge is to lure ever increasing numbers to the countryside and rural towns from the annual 7.4 million tourists. The rural tourism service works in conjunction with other major players in the tourism industry. The Rural Tourism Federation produced a series of ''keep-sake'' regional brochures.

Marine industry.

A new seven-year research project is being undertaken in partnership with NUI Galway. This research seeks to develop a comprehensive understanding of the structure and functioning of Ireland's marine industry the results of which will assist policy makers by providing them with a baseline against which the development and contribution of the marine industry to rural areas can be assessed.

Poultry

The poultry sector has two divisions, poultry meat and eggs. Farm gate value is €150m.

Two free range egg courses were conducted through e-learning. An e-learning module on poultry meat production was developed. An organic poultry production course was run for twenty participants. Information on all aspects of poultry production was disseminated.

Advice and mentoring to establish poultry enterprises was provided. Strong linkages were maintained with DAFF, Bord Bia and other agencies.

MARIANNE LYONS
LECTURER IN FORESTRY
AT BALLYHAISE COLLEGE,
CO CAVAN.

Marianne is a native of Wexford and specialised in forestry at UCD before spending time working in forestry in the UK and in private industry in Ireland. Six years ago Marianne joined the staff at Ballyhaise as a forestry lecturer and now provides full time FETAC level five and level six courses for forestry students. Numbers taking forestry course have risen steadily in recent years with 25 students registered on full time courses at Ballyhaise this year.

"Qualifications are essential for people who want to work in the industry," says Marianne. "We are currently the only institution on the island providing fulltime FETAC forestry courses and we have students from as far away as Cork."

Ballyhaise offers students the possibility to progress to a full degree course at the Waterford Institute of Technology the courses at Ballyhaise have been heavily oversubscribed in recent years.

"As well as academic learning we make sure that students gain practical skills such as planting, shaping trees, using chain saws etc," says Marianne. "Timber prices are high right now and there is a lot of interest in forestry. Prospects for students are good."


cafasc
HEAD OFFICE
RECEPTION

GOAL 4

Enhance organisational capability and deliver value for money

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GOAL 4

Enhance organisational capability and deliver value for money

Property Services

Ministerial approval to sell the Limerick Office and the Lismore office in Waterford was received and auctioneers have been appointed. Approval has also been received in relation to the disposal of the farm in Kilmaley Co Clare. A total of six advisory offices have now been closed in Ballyjamesduff, Gort, Headford, Athlone, Castlebar and Carrick-on- Shannon. Two property sales were completed in Athenry and Ballyhaise.

Customer Service

1,000 advisory clients returned comments cards in 2009. 74% were very satisfied with the quality of services, 21% were satisfied, 3% were dissatisfied and 2% were very dissatisfied. 95% of respondents consider the service to be prompt and efficient and 99% were treated with courtesy.

Procurement

A procurement officer was appointed with effect from 14 December 2009. High initial priority in the role will be to devise and implement a procurement strategy for Teagasc.

Education

The amalgamation of the staff, students and horticultural training programmes at Warrenstown Horticultural College was completed on 29th June 2009. A total of 21 staff transferred into Teagasc with 14 relocating to the College of Amenity Horticulture at the National Botanic Gardens and at Kinsealy. The balance of seven staff were transferred into other priority assignments in Teagasc. A total of 155 students also transferred to the College of Amenity Horticulture and their existing programmes are being continued in the Botanic Gardens/Kinsealy.

Three lead colleges namely, Kildalton, Ballyhaise and the Botanic Gardens were established along with 12 Regional Education Centres.

Professor Jimmy Burke of Teagasc Oak Park, His Excellency Øyvind Nordsletten and Minister of State Mr. Trevor Sargeant sending an official deposit of Irish Agricultural seeds to the recently opened Svalvard Global Seed Vault in Norway.

The Regional Education Centres have a total of 32 Education Officers and are reporting to the two newly appointed Education Managers, one North and one South.

During 2009 agreement was reached with six Institutes of Technology regarding payment to Teagasc for service delivery at a rate of €100 per hour plus a 40% overhead charge.

The joint programme between Institute of Technology Blanchardstown and the Botanic Gardens/Warrenstown was discontinued in 2009 and will be replaced by a Level 8 Horticultural Degree Programme in conjunction with Dublin City University.

The migration of all Teagasc awards to the new FETAC Common Awards System is well underway with the Level 5 ACA migration completed and the Level 6 ACA, Horticulture and Forestry Awards underway.

The new Dairy Degree Programme developed jointly by Teagasc and UCD commenced in September 2009 with fifteen participants. These students will spend part of the programme at Moorepark and Kildalton with practical learning periods spent in New Zealand.

The new Leadership Module which was developed in conjunction with Macra Na Feirme was rolled out in all college-based Level 5 programmes.

Above: IFA president Padraig Walshe, Profesor Maurice Boland, Dr. Karina Pierce, UCD and Professor Gerry Boyle Teagasc, at the launch of the Bachelor of Agricultural Science Dairy business Degree Programme.

New Education Facilities at Teagasc Kildalton College Opened

The Minister for Agriculture, Fisheries and Food, Brendan Smith TD, officially opened the new €4 million Education Building at Kildalton College, Piltown, Co. Kilkenny, which he described as "a significant step in the development of agricultural education in Ireland and is a clear demonstration of Teagasc's leading role as an education provider to the agriculture and food sector."

The new education facility incorporates a lecture theatre, classrooms, laboratories, library and a range of student recreation facilities. Kildalton College has been operating since 1971 and has a long tradition in providing agriculture and horticulture education programmes to the farming community. Over 600 students now attend further education and higher-level education programmes at the College.

The 2009 Walsh Fellow of the Year and winner of the RDS medal was Brid Coffey, a student at the Teagasc Moorepark Food Research Centre. She received the award for her research work and paper on Biocontrol of Escherichia coli O157:H7: Evaluation of two anti-E coli O157:H7 Bacteriophage in the cattle rumen. Brid is from Caherciveen, Co. Kerry. Also pictured are Jim Flanagan of the RDS and Professor Gerry Boyle.

Scientific collaboration.

Scientific collaboration between the Agri-Food and Biosciences Institute (AFBI) and Teagasc was formally recognised with the signing of a Memorandum of Understanding between the two organisation. Both organisations wish to encourage substantial research co-operation in some or all of the fields of animal health and disease control, animal and crop production, climate change, renewable energies, grass breeding and utilisation, food safety and agricultural economics; all research being for the mutual benefit of the island of Ireland.

The MoU will provide opportunities for the exchange of scientific staff to carry out joint research and/or to organise and attend scientific meetings, with a view to promoting the development of co-operative research.

Walsh Fellow of the year.

The 2009 Walsh Fellow of the Year and winner of the RDS medal was Brid Coffey, a student at the Teagasc Food Research Centre, Moorepark. She received the award for her research work and paper on Biocontrol of Escherichia coli O157:H7: Evaluation of two anti-E coli O157:H7 Bacteriophage in the cattle rumen. Brid is from Caherciveen, Co. Kerry.

The winner of the best poster is Paul Sullivan, a student at Teagasc Food Research Centre, Ashtown. His poster was on Enhancing the nutritive aspects of wheat bread through the inclusion of milled barley fractions.

GOAL 4

Enhance organisational capability and deliver value for money

Staff numbers

Total staff numbers fell by 244 during 2009. The fall was made up of retirements, non renewal of contracts and departures under the Incentivised Early Retirement Scheme.

Staff Training & Development

Training on the implementation of the Renewed PMDS was completed in early 2009 (a total of 1,303 staff participated). The renewed PMDS process, with performance appraisal and upward feedback, was operational in 2009. A total of 1,315 training proposals for 981 individual staff and 25 groups of staff were referred from the PMDS onto the 2009 staff training planning process.

In the planning process, a €0.6m budget was allocated across 53 management units to fund approved training/development actions.

In line with the aim to achieve lower cost training internal trainers delivered 17 in-house courses to 150 staff on a range of personal, work related skills. A DVD was produced as a learning aid for the ''Making an Effective Farm Visit'' module.

Many second level students visited the main Teagasc Centres during Science Week in November 2009.

Alastair Doherty from County Donegal was the 2009 Teagasc Student of the Year. The award, sponsored by FBD Trust, were presented by the Minister for Agriculture, Fisheries and Food, Brendan Smith TD. Also pictured are Hugh Ryan of FBD and Professor Gerry Boyle.

Health and safety

A joint initiative with the Health and Safety Authority provided training to 2,091 farmers and two new papers were prepared in relation to farmer behaviour in H&S.

ICT

The HR Adest system was replaced by the new Document Management System. The DMS has also been rolled out to three Advisory Areas, to the Oak Park, Grange, RERC, Athenry and Moorepark Centres and to the Pig, Forestry and Agricultural Catchments units. Additionally Foreign Travel and Hardware Request forms have been developed and web-based forms are under development for Annual Leave, Technical Training and Strategic Training.

Science writing/editing

Four issues of TResearch were produced, including a special 60-page issue on expansion of the dairy industry.

Two issues of the Irish Journal of Agricultural and Food Research were produced. A third issue was produced for the International conference 'Forage Legumes in Temperate Pasture-Based Systems'. Science Week events took place at five research centres and one local library and the Walsh Fellowships annual seminar.

Dr. Paul Cusack was presented with the Teagasc gold medal for his work at the Teagasc College of Amenity Hortuculture, National Botanic Gardens.

GOAL 4

Enhance organisational capability and deliver value for money.

Artist Cathy Carman who produced the sculpture 'Generations' which is mounted on the extension. The sculpture represents the partnership of rural men and women, grounded in the soil.

Above: Director Gerry Boyle and Chairman Dr. Noel Cawley at the opening of the extension to Oak Park house.

Husband and wife, Professor Paul Ross and Dr. Catherine Stanton of Teagasc Moorepark were both presented with D.Sc. degrees on the same day by UCC.

Intellectual Property

Advanced training was provided to staff through "Strategem" in Ashtown & Moorepark. Invention reports/patents were filed, technology capsules drafted, active patent families managed, evaluations and licenses agreed, income from IP evaluations and licensing were monitored.

Memorandums Of Understanding were established with the Agriculture-Food and Biosciences Institute in Northern Ireland, Dublin City University, and DairyNZ (New Zealand).

- 5 patents filed 2009
- 8 invention reports
- Patent family of 19

Walsh Fellowships

A successful call in 2009 was completed with over 80 applications and 40 new Walsh Fellowships offered. A special Animal Health cluster was established. The Walsh Fellowship Seminar was held in the RDS in November with a record number of participants which were accommodated in an extended poster programme. Initial meetings were held with UCD and UCC to discuss the development of the training programmes and the terms and conditions of the scheme. No progress was made with the development of the software management system primarily due to reduced budget availability.

Property Services

The Research Vision Programme in relation to capital projects throughout the country, was well progressed in 2009 and saw the projects in Kildalton and Oak Park come to completion.

The Small Capital Programme, enabling minor improvement projects at a range of locations throughout the country to be progressed, was completed for the year.

The Advisory Office Rationalisation Programme was initiated in 2009 and saw the discontinuation of leased offices in a total of six locations: Athlone, Ballyjamesduff, Carrick-on-Shannon, Castlebar, Gort and Headford.

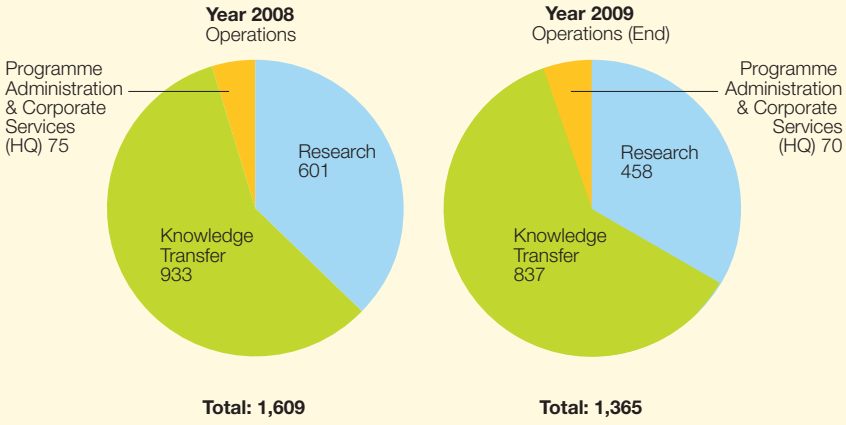
Irish Language

An action plan for the implementation of the Irish Language Scheme was identified for the year. One of the most visible actions was the commitment made in the Scheme to provide reception in Irish in all of the Teagasc offices by the middle of 2009. This action was implemented mid year and the impact and reaction from the public has been positive.

As a pilot project, Teagasc made a commitment to provide, by the end of 2009, customers in two Advisory Offices in the Gaeltacht regions in Cork (Macroom) and Donegal (Letterkenny), with the opportunity to transact business through Irish in relation to schemes and services likely to be most relevant to Irish speakers in the catchment areas of these offices.

Plans for the provision of services have been put in place and the service is available to Teagasc clients.

Employment Per Directorate



Bríd Burns, Yvonne Coulter, Loretta Patton and Mary O'Donnell. Patricia O'Connor is not pictured.

ADMINISTRATON: DONEGAL ADVISORY AREA UNIT 2009.

There are five Administrative Staff in the Donegal Advisory Area who assist and support advisory staff to equip farm families with technology and information on all aspects of agriculture.

Bríd Burns, Staff Officer is a native Irish speaker who has 29 years service with Teagasc. Mary O'Donnell has completed 38 years, Loretta Patton joined the service in 1978, Patricia O'Connor joined in 1986 and Yvonne Coulter was employed by Teagasc as REPS Admin Support in 2001. Mary O'Donnell and Patricia O'Connor were awarded "Teastas Europa na Gaeilge" certificates from NUI Maynooth in 2009 on successful completion of an Irish Language course. The Admin team works well together ensuring that no Admin Team member returns from leave to find a three week workload awaiting them. All Team members can provide cover for their colleagues in their absence.

Administration plays a major role in developing, implementing and streamlining policies and procedures to ensure that we observe good corporate governance.

Day to day tasks are common place in all Teagasc Offices such as reception duties, updating CIMS and Integra, timely submission of reports, scheme administration, recording of leave etc. However in 2009 specific tasks were allocated to Administrative Staff which included:

Puca Text Messaging: 12,700 messages were sent in 2009 an increase of 379% on the number issued in 2008.

Web Page Administration:
The Donegal Area Unit website was updated on a monthly basis; old material was archived and relevant articles and photographs were uploaded.

Events Data: 79 Events were recorded with a total attendance figure of 3000.

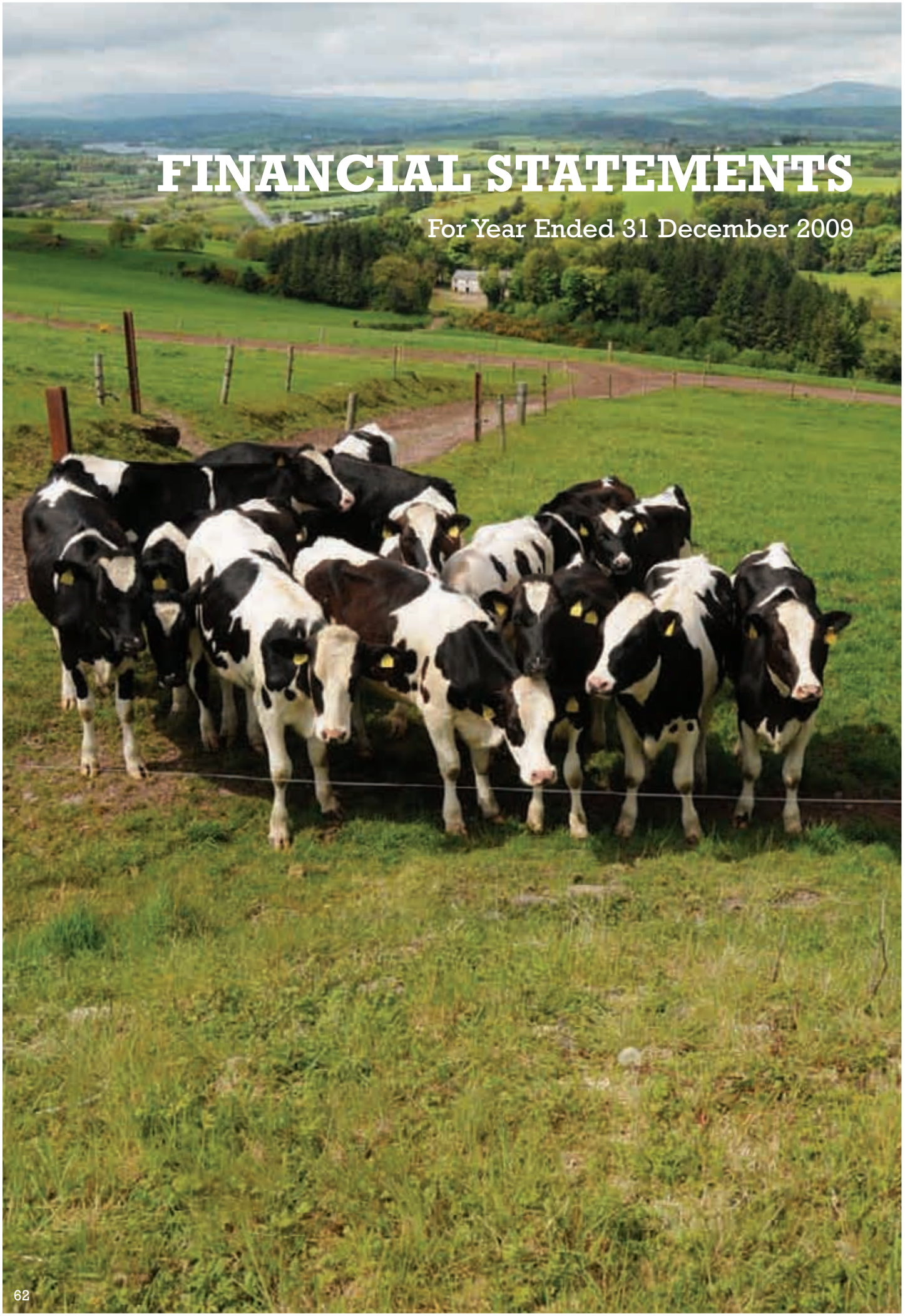
Administration of AWRBS:
11 of the 79 events held were AWRBS training events. A total of 834 farmers were trained in Donegal in 2009.

Staff Training & Development:
15 staff members availed of training under the Staff Training and Development Programme.
A number of suitable courses were sourced locally.

Voicemail Activation:
Voicemail was activated on all telephones and training was provided to Advisory Staff if required.

E Telephone Updates:
The Staff details for Donegal Staff were updated as necessary to ensure designation and contact details were up to date

REPS Support:
Approximately 400 applicants had plans submitted by the 15th May deadline. Innovation awards were presented to Bríd Burns, Loretta Patton and Patricia O'Connor in 2009 for their submissions of: Postcard invitation to public events and a One page excel sheet to record events. Developments for 2010 include the provision of Admin support for the new AEOS Scheme and the Dairy Efficiency Programme.



FINANCIAL STATEMENTS

For Year Ended 31 December 2009

FINANCIAL STATEMENTS

Year End 31 December 2009

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REPORT OF THE COMPTROLLER & AUDITOR GENERAL
for presentation to the Houses of the Oireachtas

I have audited the financial statements of Teagasc for the year ended 31 December 2009 under the Agriculture (Research, Training and Advice) Act, 1988.

The financial statements, which have been prepared under the accounting policies set out therein, comprise the Accounting Policies, the Income and Expenditure Account, the Statement of Total Recognised Gains and Losses, the Balance Sheet, the Cash Flow Statement, and the related notes.

Respective Responsibilities of the Members of the Authority and the Comptroller and Auditor General
The Authority is responsible for preparing the financial statements in accordance with the Agriculture (Research, Training and Advice) Act, 1988, and for ensuring the regularity of transactions. The Authority prepares the financial statements in accordance with Generally Accepted Accounting Practice in Ireland. The accounting responsibilities of the Members of the Authority are set out in the Statement of Responsibilities of the Authority.

My responsibility is to audit the financial statements in accordance with relevant legal and regulatory requirements and International Standards on Auditing (UK and Ireland).

I report my opinion as to whether the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland. I also report whether in my opinion proper books of account have been kept. In addition, I state whether the financial statements are in agreement with the books of account.

I report any material instance where moneys have not been applied for the purposes intended or where the transactions do not conform to the authorities governing them.

I also report if I have not obtained all the information and explanations necessary for the purposes of my audit.

I review whether the Statement on Internal Financial Control reflects the Authority's compliance with the Code of Practice for the Governance of State Bodies and report any material instance where it does not do so, or if the statement is misleading or inconsistent with other information of which I am aware from my audit of the financial statements. I am not required to consider whether the Statement on Internal Financial Control covers all financial risks and controls, or to form an opinion on the effectiveness of the risk and control procedures.

I read other information contained in the Annual Report, and consider whether it is consistent with the audited financial statements. I consider the implications for my report if I become aware of any apparent misstatements or material inconsistencies with the financial statements.

Basis of Audit Opinion
In the exercise of my function as Comptroller and Auditor General, I conducted my audit of the financial statements in accordance with International Standards on Auditing (UK and Ireland) issued by the Auditing Practices Board and by reference to the special considerations which attach to State bodies in relation to their management and operation. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures and regularity of the financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgments made in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Authority's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations that I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion
In my opinion, the financial statements give a true and fair view, in accordance with Generally Accepted Accounting Practice in Ireland, of the state of the Authority's affairs at 31 December 2009 and of its income and expenditure for the year then ended.

In my opinion, proper books of account have been kept by the Authority. The financial statements are in agreement with the books of account.

Gerard Smyth
For and on behalf of the Comptroller and Auditor General
29 June 2010

STATEMENT ON INTERNAL FINANCIAL CONTROL

On behalf of the Authority of Teagasc I acknowledge our responsibility for ensuring that an effective system of internal financial control is maintained and operated.

Any system of internal financial control can provide only reasonable and not absolute assurance against material error, misstatement or loss. In considering the effectiveness of internal financial controls, the Authority and its Audit Committee have regard, among other things, to the requirements of the Code of Practice for the Governance of State Bodies.

The Authority has taken steps to ensure that an appropriate control environment is in place by:

- clearly defining management responsibilities, authority and accountability;
- establishing formal procedures for monitoring the activities and safeguarding the assets of Teagasc;
- developing a culture of accountability across all levels of the organisation.

The Authority has established procedures to identify business risks within Teagasc by:

- identifying the nature, extent and financial implication of risks facing Teagasc including the extent and categories which it regards as acceptable;
- assessing the likelihood of identified risks occurring;
- assessing Teagasc's ability to manage and mitigate the risks that do occur;
- assessing the costs of operating particular controls relative to the benefit obtained.

The system of internal financial control is based on a framework of regular management reporting, administration procedures including segregation of duties and a system of delegation and accountability including:

- an annual budgeting and financial reporting system which is reviewed and approved by the Authority;
- regular reviews by the Authority of overall strategy, business and financial plans and variances against operating and capital budgets.

Teagasc has an internal audit function, which operates in accordance with the requirements of the Code of Practice for the Governance of State Bodies and with the effectiveness criteria set out in the Teagasc Statement of Strategy published in 2008. The work of internal audit is informed by analysis of the risks to which Teagasc is exposed and annual internal audit plans are based on this analysis. The internal audit plans are approved by the Audit Committee. In 2009 the Authority retained an external expert to advise the Audit Committee.

The Authority's monitoring and review of the effectiveness of the system of internal financial control is informed by the work of the internal auditor, the Audit Committee which oversees the work of the internal auditor, the executive managers within Teagasc responsible for the development and maintenance of the financial control framework and comments made by the Comptroller and Auditor General in his management letter.

The Audit Committee considered the report on the 'Review of Effectiveness of System of Internal Financial Control' as presented by the Internal Auditor at its meeting of 30 November 2009 and which was approved by the Authority at its meeting of 2 December 2009. They noted irregularities occurred in the invoicing of a small number of Teagasc clients in 2009. Prompt action was undertaken by management to minimise the loss to Teagasc and procedures were amended to prevent recurrence of such irregularities. Procedures for review of income/work patterns were improved and access security controls were tightened.

I confirm that the Authority conducted a review of the effectiveness of the systems of internal financial control in 2009.

Dr. Noel Cawley
Chairman
24 June 2010

STATEMENT OF RESPONSIBILITIES OF THE AUTHORITY

Under Section 12(1) of the Agriculture (Research, Training and Advice) Act, 1988, the Authority is required to prepare financial statements in such form as may be approved by the Minister for Agriculture, Fisheries and Food with the concurrence of the Minister for Finance. In preparing those financial statements, the Authority is required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- prepare the financial statements on the going concern basis unless it is inappropriate to presume that Teagasc will continue in operation;
- disclose and explain any material departures from applicable accounting standards.

The Authority is responsible for keeping proper books of account which disclose with reasonable accuracy at any time the financial position of Teagasc and which enable it to ensure that the financial statements comply with statutory requirements. The books of account are kept at the Authority's headquarters at Oak Park, Carlow. The Authority is also responsible for safeguarding the assets of Teagasc and for taking reasonable steps for the prevention and detection of fraud and other irregularities.

Dr. Noel Cawley
Chairman
24 June 2010

James Brett
Member of the Authority

ACCOUNTING POLICIES

The significant accounting policies adopted by Teagasc are as follows:

Basis of accounting
The Financial Statements have been prepared in accordance with the historical cost convention, subject to certain assets being included at a valuation (see below), and in a form approved by the Minister for Agriculture, Fisheries and Food with the consent of the Minister for Finance under the Agriculture (Research, Training and Advice) Act, 1988. The Financial Statements have been prepared using the accruals method of accounting except as stated below and in accordance with Generally Accepted Accounting Practices. Financial Reporting Standards recommended by the recognised accountancy bodies are adopted as they become applicable.

State funding
State funding for research in the Food sector, for the Stimulus collaborative research programme and for the Agricultural Catchments Programme is accounted for on an accruals basis. All other State funding is accounted for on a cash receipts basis.

Research and other projects
Grants in respect of research and other projects are included as income in the year in which the related expenditure is incurred.

Tangible fixed assets and depreciation
Assets were taken over from An Chomhairle Oiliúna Talmhaíochta and An Foras Talúntais on 8th September 1988 at the closing values in the Balance Sheets of those bodies. Additions are stated at cost.

Land is not depreciated. The cost or valuation of other owned fixed assets is written off by equal instalments over their expected useful lives as follows:

Farm Buildings	20 years
Other Buildings	50 years
Plant and Vehicles	5 years
Computer Equipment	3 years
Laboratory and Office Equipment	10 years

Assets held under finance leases are depreciated over the lease term, where this is shorter than their expected useful lives.

A half year's depreciation is charged in the years of acquisition and disposal of assets.

Leases
Fixed assets acquired under finance leases are treated in accordance with the policy noted above under fixed assets. The capital element of related rental obligations is included under liabilities, while the interest element is charged to expenditure over the term of the primary lease period.

Rentals on operating leases are charged to expenditure as incurred.

Capital account
The balance on this account represents the unamortised value of funds used to purchase fixed assets.

Stocks
Stocks have been valued by Teagasc officials. Livestock and own farm produce are valued at estimated net realisable value. Net realisable value is determined on the basis that animals are sold on the open market. Gains and losses, which arise from these valuations, are reflected in full in operational income. All other stocks are valued at the lower of cost and net realisable value.

Debtors
Known bad debts are written off as they arise and specific provision is made where recovery is considered doubtful.

ACCOUNTING POLICIES

Pensions
Teagasc operates defined benefit pension schemes which are funded annually on a pay as you go basis from monies available to it, including monies provided by the Department of Agriculture, Fisheries and Food, and from contributions deducted from staff salaries.

Pension Scheme liabilities are measured on an actuarial basis using the projected unit method.

Pension costs reflect pension benefits earned by employees in the period and are shown net of staff pension contributions which are retained by Teagasc. An amount corresponding to the pension charge is recognised as income to the extent that it is recoverable, and offset by grants received in the year to discharge pension payments.

Actuarial gains or losses arising from changes in Actuarial assumptions and from experience surpluses and deficits are recognised in the Statement of Total Recognised Gains and Losses for the year and a corresponding adjustment is recognised in the amount recoverable from the Department of Agriculture, Fisheries and Food.

Pension liabilities represent the present value of future pension payments earned by staff to date. Deferred pension funding represents the corresponding asset to be recovered in future periods from the Department of Agriculture, Fisheries and Food.

Moorepark Technology Limited
Moorepark Technology Limited is a joint venture between Teagasc and various agriculture co-operatives. Teagasc has a 57% holding in the paid up share capital of the company. Separate audited financial statements have been prepared in respect of Moorepark Technology Limited. It was not considered appropriate to consolidate the results of the company (Note 15).

Foreign currency
Transactions denominated in foreign currencies are translated into Euro and recorded at the rates of exchange ruling at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are translated into Euro at the rates of exchange ruling at the balance sheet date.

INCOME AND EXPENDITURE ACCOUNT

Year ended 31 December 2009

	Notes	31 December 2009 €'000	31 December 2008 €'000
Income			
State funding	2	**145,990**	148,945
EU funding	3	**1,755**	1,684
Operational income	4	**29,551**	32,180
Net deferred funding for pensions	9	**14,739**	21,982
Surplus on disposal of fixed assets	25	**282**	4,616
Other grants, donations and voluntary levies		**3,249**	3,395
		195,566	212,802
Expenditure	5	**201,113**	213,933
		(5,547)	(1,131)
Transfer to Capital Account	12	**(5,444)**	(10,936)
Transfer to Exchequer	25	**0**	0
(Deficit)/Surplus for the financial year		**(10,991)**	(12,067)
Balance at beginning of year		**18,970**	31,037
Balance at end of year	13	**7,979**	18,970

STATEMENT OF TOTAL RECOGNISED GAINS AND LOSSES

	Notes	31 December 2009 €'000	31 December 2008 €'000
Deficit for the financial year		**(10,991)**	(12,067)
Experience gain/(loss) on pension scheme liabilities	9	**22,535**	(5,155)
Changes in assumptions underlying the present value of pension liabilities	9	**672**	(8,539)
Actuarial gain/(loss) on pension liabilities		**23,207**	(13,694)
Adjustment to deferred pension funding		**(23,207)**	13,694
Total recognised (loss)/gain for the year		**(10,991)**	(12,067)

The above amounts relate entirely to continuing operations. The Statement of Accounting Policies and notes 1 to 27 form part of these Financial Statements.

Dr. Noel Cawley
Chairman

Professor Gerry Boyle
Director

BALANCE SHEET
Year ended 31 December 2009

	Notes	31 December 2009 €'000	31 December 2008 €'000
Fixed assets			
Tangible assets	14	**99,782**	94,338
Financial assets	15	**2**	2
		99,784	94,340
Current assets			
Stocks	17	**4,982**	5,543
Debtors	18	**11,146**	9,437
Bank balances		**14,895**	30,236
Short term deposits		**462**	598
		31,485	45,814
Creditors - Amounts falling due within one year			
Creditors and accruals	19	**13,429**	13,635
Deferred income	20	**10,079**	13,211
		23,508	26,846
Net current assets		**7,977**	18,968
Total assets less current liabilities before pensions		**107,761**	113,308
Deferred pension funding	9	**863,106**	871,574
Pension liabilities	9	**(863,106)**	(871,574)
		0	0
Net assets		**107,761**	113,308
Represented by			
Capital account	12	**99,782**	94,338
Income and Expenditure account		**7,979**	18,970
		107,761	113,308

The Statement of Accounting Policies and notes 1 to 27 form part of these Financial Statements.

Dr. Noel Cawley
Chairman

Professor Gerry Boyle
Director

CASH FLOW STATEMENT

Year ended 31 December 2009

	Notes	31 December 2009 €'000	31 December 2008 €'000
Reconciliation of operating surplus to net cash inflow from operating activities			
Operating (deficit)		**(10,991)**	(12,067)
Depreciation	14	**7,311**	6,953
Transfer to capital account	12	**5,444**	10,936
Interest received		**(829)**	(1,643)
Profit on sale of fixed assets		**(282)**	(4,616)
Decrease/(Increase) in stocks		**561**	(398)
(Increase) in debtors		**(1,709)**	(1,834)
(Decrease) in creditors and long term liabilities		**(206)**	(1,659)
(Decrease)/Increase in deferred income		**(3,132)**	4,123
Net cash outflow from operating activities		**(3,833)**	(205)

CASH FLOW STATEMENT

Net cash outflow from operating activities		**(3,833)**	(205)
Return on investment and servicing of finance			
Interest received		**829**	1,643
Net cash inflow from returns on investment and servicing of finance		**829**	1,643
Investing activities			
Payments to acquire tangible fixed assets	14	**(12,778)**	(18,185)
Receipts from disposals of tangible fixed assets		**305**	4,912
Net cash outflow from investing activities		**(12,473)**	(13,273)
(Decrease) in cash	24	**(15,477)**	(11,835)
Reconciliation of net cashflow to movement in net funds			
(Decrease) in cash	24	**(15,477)**	(11,835)
Net funds at 1 January		**30,834**	42,669
Net funds at 31 December		**15,357**	30,834

The Statement of Accounting Policies and notes 1 to 27 form part of these Financial Statements.

Dr. Noel Cawley
Chairman

Professor Gerry Boyle
Director

NOTES TO THE FINANCIAL STATEMENTS

1 Teagasc (the Agriculture and Food Development Authority)

Teagasc (the Agriculture and Food Development Authority) was established under the Agriculture (Research, Training and Advice) Act, 1988. Under Section 21 of the Act, the assets and liabilities of An Chomhairle Oiliúna Talmhaíochta and An Foras Talúntais were transferred to Teagasc upon its establishment.

Section 12 of the Act requires that Accounts shall be kept in such form as may be approved by the Minister for Agriculture, Fisheries and Food with the concurrence of the Minister for Finance. This approval was given on 14 August 1998.

2 State funding

	2009 €'000	2008 €'000
The amount shown under this heading comprises:		
Vote 31: Agriculture, Fisheries and Food		
Grant-in-aid for general expenses (including Grant for capital purposes in 2008 - €3m)	**91,836**	100,610
Grant-in-aid for superannuation purposes	**28,091**	26,754
Grant for human resource purposes	**12,000**	12,600
Food research and agriculture research	**7,024**	5,372
Stimulus collaborative research programme	**3,869**	2,839
Animal Welfare Recording and Breeding Scheme	**2,360**	0
Grant for forestry publicity and awareness	**500**	600
Grant for forestry training	**310**	170
	145,990	148,945

The 2008 comparative figures have been adjusted from those shown in the published financial statements for that year due to a reclassification of income items.

3 EU funding

	2009 €'000	2008 €'000
Farm Survey Income	**183**	269
Framework Programme VI	**851**	1,343
Framework Programme VII	**721**	72
	1,755	1,684

Framework Programmes have been the main financial tools through which the European Union supports research and development activities covering almost all scientific disciplines. Framework Programmes cover a period of five years with the last year of one Framework Programme and the first year of the following Framework Programme overlapping. Framework Programme VI ran up to the end of 2006. Framework Programme VII started on 1 January 2007 and runs to the end of 2013.

Teagasc carries out EU funded research through the Framework Programmes. Grants in respect of such research are taken into account as income when the corresponding expenditure has been incurred.

4 Operational income

	Authority, Headquarters and National €'000	Advisory Service €'000	Training and Development €'000	Agricultural Production Research €'000	Food Research €'000	**2009 €'000**	2008 €'000
Advisory service fees	0	15,472	0	0	0	**15,472**	16,209
Other fees	15	1,373	1,633	2,565	2,033	**7,619**	7,411
Livestock trading (Note 7)	0	0	954	1,072	25	**2,051**	2,919
Other farming operations	0	0	569	1,320	10	**1,899**	2,835
Canteen receipts	0	0	134	128	24	**286**	385
Publications and miscellaneous	1,531	72	263	100	258	**2,224**	2,421
	1,546	16,917	3,553	5,185	2,350	**29,551**	32,180

The 2008 comparative figures have been adjusted from those shown in the published financial statements for that year due to a reclassification of income items.

5 Expenditure

	Authority, Headquarters and National €'000	Advisory Service €'000	Training and Development €'000	Agricultural Production Research €'000	Food Research €'000	**2009 €'000**	2008 €'000
Pay (Note 8)	5,462	40,153	13,753	25,005	10,197	**94,570**	96,802
Pensions (Note 9)	57,909	0	0	0	0	**57,909**	54,957
Travelling and subsistence	476	2,395	555	907	440	**4,773**	8,058
General operating expenses (Note 6)	4,801	4,790	4,426	7,452	5,434	**26,903**	37,359
Interest and lease charges	26	0	0	0	0	**26**	33
Depreciation (Note 14)	588	621	927	3,292	1,883	**7,311**	6,953
Grants to private colleges (Note 16)	0	0	4,376	0	0	**4,376**	5,286
Other grants	109	8	1,057	2,571	1,500	**5,245**	4,485
	69,371	47,967	25,094	39,227	19,454	**201,113**	213,933

6 Analysis of general operating expenses

	Authority, Headquarters and National	Advisory Service	Training and Development	Agricultural Production Research	Food Research	**2009**	2008
	€'000	€'000	€'000	€'000	€'000	**€'000**	€'000
Farming supplies / services	3	12	1,217	1,352	8	**2,592**	4,008
Maintenance / repairs	82	585	543	1,415	2,073	**4,698**	7,907
Rents / rates / insurances	41	724	397	913	522	**2,597**	2,739
Postage / telephones	692	1,128	159	258	108	**2,345**	2,447
Power / fuel / petrol	128	416	500	800	465	**2,309**	2,664
Laboratory supplies	0	2	381	905	944	**2,232**	2,365
Printing / stationery / publicity	949	684	185	207	130	**2,155**	3,896
Seminar / classroom / library supplies	371	193	227	81	54	**926**	1,328
Services of external agencies	0	254	30	411	304	**999**	677
Student and staff canteen supplies	37	3	431	123	61	**655**	786
ICT supplies / services	1,764	86	55	41	48	**1,994**	3,863
Legal / professional fees (Note 1)	730	180	100	219	124	**1,353**	1,868
Miscellaneous programme costs	0	19	184	635	523	**1,361**	1,951
Special events and miscellaneous	4	504	17	92	70	**687**	860
	4,801	4,790	4,426	7,452	5,434	**26,903**	37,359

7 Livestock trading surplus	2009 €'000	2008 €'000
Sales	2,470	2,833
Grants and subsidies	732	789
Total livestock trading revenue	3,202	3,622
Opening stock	4,701	4,187
Purchases	710	1,217
	5,411	5,404
Less: Closing stock	(4,260)	(4,701)
Total cost of livestock sales	1,151	703
Surplus to Income and Expenditure account (Note 4)	2,051	2,919

8 Staff	2009	2008
The average number of staff employed during the year was as follows:		
Professional	806	824
Technical	194	199
Administrative/clerical	276	282
Farm/domestic	270	285
	1,546	1,590

	2009	2008
The Director's remuneration was as follows:	€'000	€'000
Basic pay	137	138
Benefit in kind (Car)	18	18
	155	156

The Director's pension entitlements do not extend beyond the model public sector defined benefit superannuation scheme.

Pension levy of €4,980,579 has been deducted from salaries and paid to the Department of Agriculture, Fisheries and Food. €14,302 of this amount relates to Moorepark Technology Limited. A further €5,467 relating to Moorepark Technology Limited is included in Moorepark Technology Limited creditors at 31 December 2009.

9 Superannuation

Section 9 of the Agriculture (Research, Training and Advice) Act, 1988 provides for the establishment of schemes for the granting of superannuation benefits in respect of staff appointed by Teagasc and staff transferred to Teagasc from An Chomhairle Oiliúna Talmhaíochta and from An Foras Talúntais.

Pending the approval of draft superannuation schemes by the Minister for Agriculture, Fisheries and Food, the Minister for Finance and the Oireachtas, Teagasc operates superannuation schemes on an administrative basis.

Teagasc also administers two superannuation schemes (the Agricultural Colleges Staff Superannuation Scheme 1985 and the Agricultural Colleges Spouses' and Children's Contributory Pension Scheme 1985) in respect of certain staff employed by privately-owned Colleges of Agriculture and Horticulture, the cost of whose salaries is borne by the Exchequer through the agency of Teagasc.

The above schemes are defined benefit superannuation schemes. No separate fund is maintained, and no assets are held, to finance the payment of pensions and gratuities. The actuarial estimate of future liabilities accruing in regard to future benefits is shown on the Balance Sheet.

The average number of monthly pensions paid during the year was 1,482 (2008 – 1,432).

Superannuation costs

(i) Analysis of total pension costs charged to income and expenditure account

	2009 €'000	2008 €'000
Current service cost	**14,062**	14,462
Interest on scheme liabilities	**48,825**	45,454
Staff contributions	**(4,978)**	(4,959)
	57,909	54,957

(ii) Movement in net pension liability during the financial year

	2009 €'000	2008 €'000
Net pension liability at 1 January	**871,574**	835,898
Current service cost	**14,062**	14,462
Benefits paid	**(48,148)**	(37,934)
Interest on scheme liabilities	**48,825**	45,454
Actuarial (gain) / loss	**(23,207)**	13,694
Net pension liability at 31 December	**863,106**	871,574

(iii) Deferred funding asset for pensions

Teagasc recognises as an asset an amount corresponding to the unfunded deferred liability for pensions on the basis of the set of assumptions described above and a number of past events. These events include the statutory basis for the establishment of the superannuation schemes, and the policy and practice currently in place in relation to funding public service pensions including contributions by employees and the annual estimates process. While there is no formal agreement regarding these specific amounts with the Department of Agriculture, Fisheries and Food, Teagasc has no evidence that this funding policy will not continue to meet such sums in accordance with current practice.

Net deferred funding for pensions in the year	2009 €'000	2008 €'000
Funding recoverable in respect of current years pensions	**62,887**	59,916
Resources applied to pay pensions	**(48,148)**	(37,934)
	14,739	21,982

The deferred funding asset for pensions as at 31 December 2009 was €863 million (2008 - €872 million).

(iv) History of defined benefit obligations	2009 €'000	2008 €'000	2007 €'000
Experience gain / (loss)	**22,535**	(5,155)	(17,031)
Percentage of present value of scheme liabilities	**2.6%**	0.6%	2.0%
Changes in assumptions	**672**	(8,539)	169,389
Percentage of present value of scheme liabilities	**0.001%**	0.98%	20.3%
Actuarial gain / (loss) recognised in the STRGL	**23,207**	(13,694)	152,358

The cumulative actuarial gain recognised in the Statement of Total Recognised Gains and Losses amounts to €150,508,000.

(v) General Description of the Scheme

The pension scheme is a defined benefit final salary pension arrangement with benefits and contributions defined by reference to current "model" public sector scheme regulations. The scheme provides a pension (eightieths per year of service), a gratuity lump sum (three eightieths per year of service) and spouse's and children's pensions. Normal retirement age is a members 65th birthday, and pre 2004 members have an entitlement to retire without actuarial reduction from age 60. Pensions in payment (and deferment) normally increase in line with general public sector salary inflation.

The valuation used for FRS17 disclosures has been based on an actuarial valuation by a qualified independent actuary on 21 January 2010 to take account of the requirements of FRS17 (revised) in order to assess the scheme liabilities at 31 December 2009.

The principal actuarial assumptions used to calculate liabilities under FRS17 are as follows:

	2009	2008
	% per annum	% per annum
Inflation rate increase	**2.00**	2.00
Salary rate increase	**3.50**	3.50
Pension rate increase	**3.50**	3.50
Scheme liabilities discount rate	**5.90**	5.70

The mortality basis adopted allows for improvements in life expectancy over time, so that life expectancy at retirement will depend on the year in which a member attains retirement age (age 65). The table below shows the life expectancy for members attaining age 65 in 2009, 2029 and 2049.

Year of attaining 65	2009	2029	2049
Life expectancy-male	86.7	87.7	87.7
Life expectancy-female	89.7	90.7	90.7

On the basis of these and other assumptions and applying the projected unit method prescribed in FRS17, the present value of pension scheme liabilities is as follows:

	2009	2008
	€'000	€'000
Accumulated liabilities in respect of active scheme members	**394,655**	367,429
Liabilities in respect of existing pensioners and deferred pensions	**468,451**	504,145
Total accrued pension liability	**863,106**	871,574

10 Audit fee

A provision of €47,470 has been included in expenditure in respect of auditor's remuneration for 2009 (2008 - €50,500).

11 Authority members' fees and emoluments

	2009 €'000	2008 €'000
The following emoluments were paid to members of the Authority:		
Cawley, Dr. Noel, Chairman - appointed Sept 2008	22	7
Brett, Mr. James	13	14
Christie, Ms. Marie	4	0
Deane, Mr. Derek	13	14
Fitzgerald, Mr. Joe	13	14
Flynn, Mr. Stephen	7	14
Fottrell, Professor Patrick	13	14
Gibbons, Mr. Padraig	13	4
Heraghty, Mr. Martin	0	0
O'Mahony, Mr. Frank	13	4
Sweeney, Ms. Margaret	13	14
Henchy, Mr. Jerry	0	12
Kelly, Mr. Patrick	0	10
O'Dwyer, Dr. Tom, Chairman - retired Sept 2008	0	17
O'Dwyer, Mr. Michael	0	10
	124	148
These amounts are included in the total pay expenditure in Note 5		
Total expenses paid to Authority members	28	56

12 Capital account

	2009 €'000	2008 €'000
Balance at 1 January	**94,338**	83,402
Transfers from income and expenditure account		
Amount capitalised in respect of purchased assets	**12,778**	18,185
Net amount released on disposals	**(23)**	(296)
Property loan repayments	**0**	0
	12,755	17,889
Less: Amortised in line with asset depreciation	**(7,311)**	(6,953)
	5,444	10,936
Balance at 31 December	**99,782**	94,338

13 Income and Expenditure account

The Authority's accumulated surplus includes profits taken to income in respect of land sales which have and will be used for capital investment purposes. The sanction of the Minister for Agriculture, Fisheries and Food and the Minister for Finance must be secured in the case of each sale transaction if Teagasc is to retain the proceeds for investment in the Teagasc programme.

	Invested to 31 Dec 2009 €'000	Budget to Complete €'000	Budget for Project €'000
Teagasc has secured sanction to invest in the following projects which are scheduled or underway:			
Functional Food Laboratories, Moorepark	4,884	616	5,500
Student and Educational Facilities, Kildalton College	3,956	174	4,130
Neutraceutical Laboratories, Ashtown	3,011	489	3,500
Biofuel Laboratories, Oak Park	877	123	1,000
Fees / Technology farm	135	35	170
Upgrade of Rural Economy Office Accommodation, Athenry	1,644	56	1,700
Sheep Research Facilities, Athenry	0	1,400	1,400
Student Facilities, Botanic Gardens	0	2,500	2,500
	14,507	5,393	19,900
Sanction has not yet been secured to complete the following projects:			
Animal Bioscience Centre, Grange, Co. Meath	718	3,882	4,600
Food Biotest Facility, Moorepark	220	780	1,000
Railway Overbridge, Athenry	0	648	648
	15,445	10,703	26,148
Teagasc has applied for but has not yet secured sanction to retain the proceeds from 2 sales completed in 2009 (Note 25)	0	181	181
	15,445	10,884	26,329

14 Tangible fixed assets

	Land €'000	Buildings €'000	Plant & equipment €'000	Total €'000
Cost or valuation				
At beginning of year	5,810	100,056	59,877	165,743
Additions	0	8,531	4,247	12,778
Disposals	0	0	(199)	(199)
At end of year	5,810	108,587	63,925	178,322
Accumulated depreciation				
At beginning of year	0	32,324	39,081	71,405
Charge for year	0	2,719	4,592	7,311
Disposals	0	0	(176)	(176)
At end of year	0	35,043	43,497	78,540
Net book amounts				
At beginning of year	**5,810**	**67,732**	**20,796**	**94,338**
At end of year	**5,810**	**73,544**	**20,428**	**99,782**

Included in the opening balances is land totalling 522.8 ha (1,291.3 acres) transferred by the Department of Agriculture, Fisheries and Food at nominal values, and certain other assets which were revalued at 31 December 1975 or 1 July 1980.

Teagasc has the use of 38.0 ha (94 acres) of land owned by the Department of Agriculture & Food, while the Department has the use of 27.1 ha (67 acres) owned by Teagasc. There is no charge to either party arising from these arrangements.

Certain fixed assets entrusted to Teagasc are protected by statute, and may not be sold.

15 Financial assets

Teagasc has a 57% holding in the paid up share capital of Moorepark Technology Limited (5,100 shares at €0.127). The Company, which was incorporated on 18 January 1991, is a joint venture between Teagasc and various agriculture co-operatives.

Separate audited financial statements have been prepared in respect of the Company and its results for the year ended 31 December 2009 were as follows:

	2009	2008
	€'000	€'000
Turnover	**1,211**	1,123
Operating profit before depreciation, interest and tax	**251**	248
Depreciation (net of grants amortised)	**(249)**	(248)
Interest receipts	**0**	4
Tax	**0**	2
Profit after taxation	**2**	6
Accumulated profits to 31 December	**35**	33

The Company's Memorandum of Association provides that shareholders are entitled to avail of the Company's services at preferential rates.

Trading transactions between Teagasc and Moorepark Technology Limited (which consists of consultancy, analyses and use of technical and other facilities) were as follows:

	2009	2008
	€'000	€'000
Moorepark Technology Limited sales to Teagasc (included in turnover)	**267**	378
Other recoupments from Teagasc (deducted from cost of sales)	**168**	0
Total	**435**	378
Amounts owed to Moorepark Technology Limited at 31 December	**40**	69
Teagasc sales to Moorepark Technology Limited	**47**	140
Amounts owed to Teagasc at 31 December	**31**	6

Under the terms of the Moorepark Technology Limited Promoters' Agreement, Teagasc has undertaken to provide from its own resources specified staff requirements in Moorepark Technology Limited, as well as underwriting the Company's utility, stores, accounts and effluent overheads. These costs were as follows:

	2009 €'000	2008 €'000
Staff	176	185
Other	67	190

These totals are included in Teagasc expenditure under Food Research (Notes 5 and 6).

Moorepark Technology Limited utilises assets owned by Teagasc as follows:

	2009 €'000	2008 €'000
Original Costs	1,196	1,196
Net Book Value at 31 December	34	53

These amounts are included under Plant and equipment (see Note 14 above).

In accordance with the Promoters' Agreement, Teagasc has also leased to Moorepark Technology Limited at a nominal rent of €127 per annum its existing processing hall at Moorepark Dairy Products Centre together with an adjoining site on which the Company has constructed additional facilities.

It was not considered appropriate to consolidate the results of the Company.

Teagasc has three small investments in agricultural co-operatives costing €1,243 in total (2008 - €1,243).

16 Private Colleges

Teagasc provides support to four private agricultural colleges as follows:

	2009 €'000	2008 €'000
Grants to private colleges	4,376	5,286
Staff seconded to private colleges (included in the total pay expenditure in Note 5 above)	485	513
	4,861	5,799

One of the four private colleges, Warrenstown Agricultural College, closed in June 2009.

17 Stocks

	2009 €'000	2008 €'000
Livestock	4,260	4,701
Farm produce, fertilisers and feeding stocks	545	668
General supplies	177	174
	4,982	5,543

18 Debtors and prepayments

	2009 €'000	2008 €'000
Trade debtors	5,242	4,799
Other debtors, prepayments and accrued income	5,904	4,638
	11,146	9,437

All amounts included above fall due within one year.

19 Creditors - Amounts falling due within one year

	2009 €'000	2008 €'000
Trade creditors	2,529	2,143
Income tax deducted under PAYE	1,613	1,805
Pay related social insurance	879	814
Value added tax	165	313
Withholding tax	94	163
Other creditors and accruals	8,149	8,397
	13,429	13,635
Creditors for taxation and social welfare included above	2,751	3,095

20 Deferred income

Teagasc carries out public funded research in accordance with contracts with other State Institutions, principally the Department of Agriculture, Fisheries and Food. Grants in respect of such research are taken into account as income when the corresponding expenditure has been incurred under each contract.

At 31 December the source and amount of deferred income in respect of research and other projects was as follows:

	2009 €'000	2008 €'000
Department of Agriculture, Fisheries and Food – advance for FIRM projects	1,870	2,806
Department of Agriculture, Fisheries and Food – advance for Stimulus projects	2,054	3,879
European Science Foundation – Food Safety Promotion	331	480
Other research related deferrals	4,710	4,859
Amounts received in advance for work associated with the completion of sale of land at Athenry	1,114	1,187
	10,079	13,211

21 Finance leases

At 31 December 2009 Teagasc had no obligations under finance leases (2008 - Nil).

There were no finance charges incurred during the year under finance leases (2008 - Nil).

22 Capital commitments

Capital commitments outstanding at 31 December 2009 amounted to €1.45 million (2008 - €7.2 million).

23 Operating leases

At 31 December 2009 Teagasc had annual commitments under non-cancellable operating leases as follows:

	Land and buildings €'000	Plant and machinery €'000	Total €'000
Leases which expire:			
Within one year	105	85	190
Between two and five years	219	45	264
After five years	110	0	110
	434	130	564

24 Analysis of changes in net funds during the year

	1 January 2009 €'000	Cashflows €'000	31 December 2009 €'000
Cash at bank and on hand	30,236	(15,341)	14,895
Bank overdraft	0	0	0
Short-term deposits	598	(136)	462
	30,834	(15,477)	15,357

25 Disposal of Fixed Assets

	Proceeds/ Costs €'000	Proceeds/ Costs €'000
Proceeds from sale of property *		
House at Athenry and Land at Ballyhaise	193	
Cost of sales	(12)	
		181
Proceeds from sale of other assets		124
		305
Net Book Value of other fixed assets disposed		(23)
		282

There was no transfer to the Exchequer of asset sales proceeds in 2009.

* The written down value at the start of the year of the property sold was nil.

26 Authority members – disclosure of transactions

The Authority has adopted procedures in accordance with the guidelines issued by the Department of Finance in relation to the disclosure of interest by Authority members and the Authority has adhered to these procedures. There were no transactions in the year in relation to the Authority's activities in which board members had an interest.

27 Approval of the financial statements

The Authority approved the financial statements on 3 March 2010.

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