
Teagasc Animal and Grassland Research and Innovation Programme Peer Review 2011

Final Report

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1. Introduction

Teagasc is committed to carrying out regular peer reviews of its programmes to: (i) assess if an effective and balanced scientific programme is being delivered which fulfils the mission of the programme and meets the needs of its stakeholders; (ii) to identify how the programme and operation of the centre(s) could be improved to make best use of resources; and (iii) to provide accountability for public funds expended.

This evaluation report presents the outcome of the Animal and Grassland Research and Innovation Programme peer review held on 1-3 November 2011. The peer review was carried out under the auspices of the Director of Research and the Teagasc Business Planning and Performance Evaluation Unit by a Peer Review Committee (PRC) composed of the following experts:

Sinclair Mayne (Chairperson), Dorian Garrick, Julie Fitzpatrick, John O'Doherty, Brian Wickham, Michael Doran, Mike Magan, Lance O'Brien, Jane Kavanagh (Secretariat) and James Maher.

The objectives of this peer review were to:

- Improve the programme's research quality, including scientific and societal relevance of research, industry impact, research strategy, research management and knowledge transfer.
- Provide accountability to the board of Teagasc, and towards funding agencies, government and society at large.

2. Review of Teagasc AGRI Programme

Food Harvest 2020 provides a vision for the future of the Irish agri food industry based on smart, green growth. A key aspect of this vision is the need to develop competitive and sustainable livestock production systems. The research and development and knowledge exchange activities of the Animal and Grassland Research and Innovation (AGRI) Programme within Teagasc will play a critical role in making this vision a reality.

The AGRI Programme is one of four Teagasc programmes which underpins the organisation's overall mission to support the profitability, competitiveness and sustainability of the agri-food sector and wider economy. The overall vision of the AGRI Programme is to be an internationally known and recognised animal and grassland research and innovation programme producing new leading edge technology and models to drive the Irish agri-food industry.

The primary objectives of the programme are to:

- Increase the profitability and competitiveness of Irish animal production systems.
- Improve the environmental sustainability of Irish animal production systems in terms of efficiency of nutrient use and greenhouse gas emissions.
- Enhance the quality and safety of Irish meat and milk products.
- Assist in the delivery of new technology to key stakeholders.
- Become a leading international science authority on technologies for pasture-based animal production.
- Become a leading international science authority on improved animals (cattle and sheep) through breeding, genetics and use of genomics.
- Contribute to the achievement of targets set out in *Food Harvest 2020*.

The AGRI Programme management structure involves three research departments: Grassland Science; Animal and Bioscience; and Livestock Systems, two knowledge transfer departments: Dairy; and Drystock and a Pig Development department.

2.1 Reflections on Programme Quality

Overall, the PRC considers that a number of components of the AGRI programme are world leading and some individual scientists are working at the forefront of their field internationally. We recognise that the Programme has undergone significant improvement and reorganisation in recent years, and some of these changes will require time to fully bed in. We recognise that the agri food sector is also undergoing significant change, and will continue to adapt and evolve in response to international and national developments. In this context, the PRC considers that organisational structures need to facilitate flexibility, and enable rapid response to changing circumstances.

The PRC considers that the current management structure is cumbersome and bureaucratic, with six Departments and three Enterprise Leaders. The roles and responsibilities of some elements of the management structure were unclear to the PRC, in particular the role of Enterprise Leaders. The PRC recommends that the programme management structure be reviewed with the objective of developing a more streamlined and integrated organisational structure.

The PRC was also concerned to note the current moratorium on staff recruitment within Teagasc and considers that this restraint on Teagasc management makes the achievement of the Teagasc mission extremely challenging.

The PRC considers that the incorporation of Knowledge Transfer (KT) within the overall programme is an important and positive development, and is enabling effective transmission of research to Business and Technology (B&T) Advisors, whilst also ensuring that researchers are more fully aware of industry needs. The quality of KT is particularly effective in the dairy sector, with excellent working relationships between research staff and KT specialists. The PRC considers that there is scope for improvement in KT to support the drystock sector, particularly in relation to stronger linkages between research staff and staff in the Drystock KT department.

The PRC recognises that the future competitiveness and sustainability of the ruminant livestock sector in Ireland is dependent upon the efficient production and utilisation of grass. The PRC therefore supports the strong emphasis within the research programme on research to increase the production and utilisation of grass, given the considerable potential which exists on many Irish farms. However, the PRC considers that there is scope to improve the application of science and technological developments from the Grassland Science and Livestock Systems departments to the beef and sheep sectors.

2.2 Reflection on Leadership and Vision

The AGRI programme has strong leadership and vision, particularly in the integrated approach used to support the dairy sector – in part, this may reflect the fact that the Dairy Enterprise Leader is also the Head of the Livestock Systems Department. The integrated approach is less apparent for the beef, sheep and pig sectors, and the PRC considers that this is still a work in progress.

Whilst senior management have a clear vision of the role of the Animal and Bioscience Department, this vision was not apparent throughout the AGRI Programme. The PRC also perceived the absence of a clear, cohesive approach within the Animal and Bioscience Department. This Department needs to develop strong links with other Departments and key stakeholders. The PRC recognises that this is a two-way process, and that staff within the more applied departments need to give more consideration to the potential application of new technologies, for example the “omics”, to help address some of the more complex issues for livestock and grass.

2.3 Reflection on Productivity

Overall productivity of the Programme is very good, with an excellent balance of scientific outputs, including an increasing focus on high impact journals, and effective knowledge transfer. Knowledge transfer outputs from the programme are particularly impressive for the

dairy sector, and an excellent suite of support tools has been developed to assist farmers achieve improvements in grassland and dairy herd management.

Whilst some of the grassland management tools are being applied to the beef and sheep sectors, the PRC considers that there is substantial scope for further application of tools to these sectors. The BETTER Beef and BETTER Sheep programmes, developed in conjunction with industry, demonstrate the potential for improvement, and present a valuable platform for development of a cohesive KT strategy for these sectors. However, considerable investment will be required in developing new advisory tools and infrastructure, as the PRC recognises that the current advisory input into the BETTER Beef and Sheep programmes is not sustainable on an industry-wide scale.

The Pig Development Department has a good range of outputs, including publications, knowledge transfer, education and training. The PRC considers that stronger links should be developed between this department and the Animal and Bioscience Department, particularly in research areas such as feed efficiency and reproduction. The PRC also recognises that the Pig Development Department is a small group with limited staff resources and outdated research facilities. Consequently, the PRC recommends that a joint industry/Teagasc working group review future research needs of the pig industry and mechanisms of delivery, including the potential for increased industry funding.

External research income across the AGRI programme is generally good, although there are significant variations between departments and there was evidence that early career scientists were more effective in securing external research funding. In a number of cases, staff highlighted an impressive array of international and national linkages, but the actual benefit / output of these linkages was not always clear. Given current budget pressures, the PRC recommends that there should be increased emphasis on using these linkages to lever additional national and international funding, and to more efficiently gain access to knowledge and technology.

The PRC recognises the value of existing collaborations with industry organisations, but also considers that there are further opportunities in this area. Whilst it is difficult for state-funded organisations to create strong alliances with commercial businesses, the PRC considers that there are opportunities, particularly for the Animal and Bioscience Department. Consideration should be given to how such linkages could be facilitated.

2.4 Reflection on Relevance and Impact

As indicated at the outset, Food Harvest 2020 provides a vision for the Irish agri food sector and the PRC considers that overall, the AGRI programme is playing, and will continue to play, a major role in making this vision a reality. Effective KT is critical in ensuring that information from the research programme is widely disseminated. The PRC considers that in order to achieve this, the KT Departments need to develop better linkages with social science in order to more fully understand factors which influence behaviour change by farmers, and barriers to adoption of new technologies.

The Food Harvest 2020 report places particular emphasis on the importance of the global challenges of sustainability and climate change, and the need to differentiate Irish food production using science-based evidence to underpin sustainability credentials. The PRC was concerned that relatively little emphasis was placed on these key issues in the presentations and / or written submissions, with the bulk of the emphasis on increasing output. However, in discussions with staff following presentations, it is clear that there is a considerable knowledge base in this area.

The PRC considers that the AGRI programme should be leading the debate on climate change and greenhouse gas emissions from the agri-food sector, particularly in relation to the issue of emission intensity per unit of production, as opposed to absolute emission levels. This issue will have national and international implications, and whilst the AGRI Programme is undertaking valuable work in this area, this was not readily apparent from written or oral presentations. In this context the role of Carbon sequestration and grassland is particularly

important, and a more integrated animal /environment / crops approach is needed to address this complex issue. The Panel also discussed the absence of any significant reference to food and food quality in the documentation and presentations, and felt this was a major omission. The PRC recommends that the Programme should address this matter and consider the potential benefits deriving from improved linkages with Teagasc's food processing programme.

2.5 Key Recommendations for AGRI Programme

1. Maintain and enhance the emphasis on increasing grass production and utilisation across all ruminant livestock programmes.
2. Review the role of the Animal and Bioscience Department in order to develop and communicate a more cohesive and persuasive vision and mission for the Department that appropriately leverages the resources and contributes to the endeavours of other departments. The review should also consider opportunities to develop collaborations with other industry organisations.
3. Review the future research needs of the pig industry, including consideration of funding arrangements and best methods of delivery, through a joint Industry/ Teagasc group.
4. Invest in infrastructure development and tools to support the beef and sheep sectors to become profitable.
5. Improve the application of science and technological developments from the Grassland Science and Livestock Systems Departments to the beef and sheep sectors, including consideration of the development of a 'Greenfield Farm' employing the same model as in dairying.
6. Increase emphasis on using national and international linkages to lever external research funding. Consideration should also be given to developing stronger links with commercial and other industry organisations.
7. Explore opportunities to further improve and develop links between the AGRI programme and social science research to obtain a better understanding of factors influencing behaviour change, and the barriers to adoption of new technologies.
8. Enhance emphasis of Research and KT outputs from the AGRI Programme on issues relating to sustainability, environmental impact and opportunities to develop value added food products.
9. Develop improved linkages with the food processing programme within Teagasc to facilitate increased emphasis on nutritional aspects of food.
10. Review organisational structures to achieve a more streamlined and integrated approach, thereby ensuring efficient and effective delivery of agreed national programmes and flexibility to respond to changing circumstances and priorities.

Peer Review Committee Score for the AGRIP Programme (1-5)	4
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3. Review of Grassland Science Department

The overall objective of the Grassland Science Department is to improve the efficiency of production and utilisation of grazed pasture thereby enhancing the competitive advantage of Irish animal production systems. A multi disciplinary approach is used involving grass physiologists, agronomists, plant breeders, animal nutritionists and environmental expertise.

The research programme areas include: grass breeding and evaluation; grass feeding value; grass growth, dynamics and utilisation; soil fertility and nutrient use; and grazing management. Grass breeding involves use of both traditional and new biotechnology-based breeding approaches and a unique grass selection index has been developed to enable selection of cultivars for increased animal performance. In relation to grazing management a series of farmlet type studies have been used to examine the impact of changes in stocking rate, calving date, grazing residual and introduction of grass/clover swards on overall grassland utilisation and animal performance.

Recent work has focused on developing computer-based models to predict grass growth, grass intake and milk production as a basis for improved decision support tools. There is a strong focus on minimising losses of nitrogen and phosphorus to the environment and on opportunities to reduce greenhouse gas emissions.

3.1 Reflection on Quality

The PRC was impressed with the clear leadership and cohesion evident within the Grassland Science Department. The research undertaken by the Department has a strong national focus, and has the potential to become world leading.

The Department was the first to develop a multi-trait economic index for the selection of grass varieties. This represents a major step forward in plant breeding and evaluation, and involved extensive international collaboration. One of the main challenges in developing this approach is that only 5% of pasture in Ireland is reseeded annually. Consequently, there is relatively limited market potential for locally bred varieties and this highlights the need to work with international plant breeding companies. Given the importance of variety selection in determining pasture production the PRC believes that further consideration should be given to options for ensuring plant breeders supplying Ireland are adopting breeding practices most appropriate for meeting the needs of Irish farmers.

National and international collaboration is strong with institutions such as INRA, AFBINI and DairyNZ.

3.2 Reflection on Productivity

The productivity of the department is very good in terms of the number of publications per permanent researcher (FTE), with an increase in average impact factor over the past five years. The strategy for targeting high impact journals has been effective. The programme has been very successful in obtaining Walsh Fellows and this has had a major impact on overall productivity.

3.3 Reflection on Relevance

The development of an economic breeding index for grass varieties is an exciting development. More engagement with industry will be required before this approach can be transferred to farm level. In general, the research programme is closely aligned with national priorities and stakeholder needs as evidenced through interactions with industry and linkages with KT departments. The Grass Roots programme and the development of grass calculators for on-farm use are important and effective developments in transferring technologies to farmers, including the spring planner, grass wedge and autumn grass budgeting models. These models have potential for further expansion.

Overall, the PRC considers that whilst there is a very strong application of grassland science in relation to dairy herd management, there is considerable opportunity to apply similar principles to the beef and sheep sectors.

3.4 Reflection on Vitality, Feasibility and Vision for the Future

The PRC considered that there was little evidence of a long term vision, from a scientific or industry perspective,

for the Grassland Science Programme. An overall programme vision outlining future research priorities and targets for the next five years should be developed. There is a strong emphasis on research to support the dairy sector and a similar emphasis is needed for the sheep and beef sectors. More integration is needed within the programme to strengthen research and KT activity across the enterprises. Overall, the PRC considers that whilst the programme is still developing, it has the potential to become world class.

3.5 Conclusion

The Grassland Science Department is highly productive and is undertaking nationally important research, with a very strong emphasis on the dairy sector. However, there is considerable scope for the Department to develop a similar emphasis in relation to the beef and sheep sectors. Whilst the PRC recognises that the research programme is still developing, the Department needs to establish a longer-term (5-10 years) vision for future research priorities and targets in order to become a world leading centre in grassland science.

Peer Review Committee Score for the Grassland Science Department (1-5)	4
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3.5 Recommendations

Maintain and enhance the emphasis on increasing grass production and utilisation across all ruminant livestock programmes.

Improve the application of science and technological developments from the department to the beef and sheep sectors.

Increase emphasis on using strong national and international linkages to lever external research funding.

Review the ability of plant breeders to deliver genetic gain in pasture varieties most appropriate for Ireland.

4. Review of Animal and Bioscience Department

The Animal and Bioscience Department is a recently (2010) formed department designed to integrate animal science staff from three sites (Athenry, Grange and Moorepark) with externally recruited scientific staff possessing expertise in molecular and computational biology. The overall aim of the Department is to develop a combination of established animal science techniques and new developments in molecular and computational biology to address relevant industry research questions. Research encompasses nutrition, fertility, breeding, health and welfare, with a primary focus on producing profitable animals.

The research programme areas include: animal breeding and genomics; reproduction and fertility; health and welfare; feed efficiency; and product quality.

Animal breeding research is developing tools to support multi trait breeding indices in dairy, beef and sheep and excellent progress has been made in developing genomic selection for dairy cattle, with Ireland being one of the first countries worldwide to adopt this approach.

Research on reproduction and fertility is seeking to understand the biological causes of reproductive failure using a combination of conventional endocrine and physiological approaches combined with genomic, proteomic and bioinformatic tools.

The health and welfare programme has a strong interdisciplinary focus with a combination of approaches being used to study mechanisms to control animal disease and to improve animal welfare. Research on feed efficiency and product quality uses a variety of animal models to better understand the mechanisms influencing the efficient conversion of nutrients to animal product.

4.1 Reflection on Quality

The overall quality of the research was considered by the Review PRC as very good. This was reflected by outputs: publications in peer reviewed journals, most with an international readership, and income: successful external funding gained by a reasonable proportion of scientific staff. A few staff members stood out as having been particularly successful in attracting income from a wide variety of funding bodies, both within and outside Ireland.

There was evidence of some world-class research outputs in a number of scientific areas; this was provided in the self-assessment report and through personal links and awareness of scientists within the Department by Review PRC members.

The quality of research at the level of the whole Department was however, less clear. It was felt that some work was needed to ensure both national and international awareness and recognition of this relatively new scientific initiative in Teagasc.

The group is focused on more basic/strategic aspects of science compared to other departments and thus is technology driven. Scientific staff undertakes technological aspects of their work where facilities and resources are available, while in other situations, decisions to outsource work and services has been taken. This reflects the rapid development of technology in animal science and seems appropriate for this group.

The group has benefitted from the recruitment of individuals with skills in molecular biology, immunology and computational biology. These appointments were made some years ago and the numbers of individuals were limited by previous and current budgets. Nonetheless, it has clearly been recognised that investment in areas that complement genetics, reproductive biology, nutrition, microbiology/parasitology and animal behaviour are essential to allow this group to make an increased impact.

The Group presented details of national and international academic links in most of these areas of science; however, the benefits in terms of science quality and/or external funding to all involved in the partnerships did not come through in the presentation.

The group covers a very wide scope in terms of science focus, and while this is necessary to address real-life issues, it can lead to the appearance of a disconnect and lack of cohesiveness among individual scientists and/or their groups.

It was encouraging that scientists working on generic areas (e.g. computational biology) stated that they were attracted to Teagasc, and this group in particular, by the opportunity to work on real on-farm problems and to develop practical solutions to these problems.

4.2 Reflection on Productivity

The group has a good balance of core to contract staff (3:1) and receives over €3,500,000 in funding from combined sources (a considerable resource). It was difficult to gauge the complexity and scope of individual projects and hence not possible to look at productivity by project area.

The papers per FTE were good (although the PRC expressed some concern on how the denominator for this metric was calculated), and the impact factors were within the expected range for those focused on animal science (c.f. basic microbiological science or human medicine).

4.3 Reflection on Relevance

The work undertaken by this group is highly relevant to Ireland and wider scientific communities. It was recognised that research in certain areas e.g. in animal health and disease was **limited** by Teagasc's enabling legislation dealing with commercial activities.

Greater interactions with other Departments and with external stakeholders would benefit the focus and impact of this Department.

All research areas were considered relevant or highly relevant – nutrient efficiency and quality is an increasingly important area for traditional livestock production, biological efficiency, and sustainable protein production worldwide; animal health in Ireland has been significantly threatened especially by TB; mastitis adversely affects the quality and safety of milk production; and innovative work on animal welfare has translated into tangible herd schemes, assurance schemes, guidelines and national legislation. Of these, only the last was expanded on as an example of research undertaken in previous years impacting on current practices and policies. Many other areas such as animal breeding and genomic selection are known to have had substantial impact. However, this was not particularly clear from the data and information presented.

There seemed to be a lack of interaction between the Pig Development Department and the Animal and Bioscience Department, leading to gaps in opportunities to enhance research activities on pigs.

While some reference was made to interactions between animal bioscience and plant biosciences, this could be expanded to increase impact across both sectors.

4.4 Reflection on Vitality, Feasibility and Vision for the Future

A cohesive and persuasive “vision” (where we want to be) and “mission” (how we intend to get there) was not evident to the PRC.

There was little evidence of cross-departmental interactions, yet it was felt that animal bioscience had a major role to play in sustainable systems (including environmental areas such as climate change and food security).

The PRC considered that some of the research focus mirrored that of many other organisations in a number of countries, and it was not clear what this group's “unique selling point” might be in some of these areas. Although reference was made to numerous partners

worldwide, it was difficult to envisage the principal links (unless already known by the review PRC).

It was recognised that the group needs to move from the “middle ground” of individual farm-based studies in both directions: detailed experimental studies to answer specific and novel hypotheses, and to population-based studies which are required to unravel the complexities of real-life situations. It was not clear how this was going to be achieved.

There was lack of evidence of brainstorming as a group, where grand challenges might be considered and prioritised, linking to the particular skills of the group. The aim of “vaccine response model” was not expanded on or emphasised, so it was unclear if this was the “correct” overall focus.

It was recognised that effort needs to be made to increase mutual understanding of those involved in basic/strategic research and those in strategic/applied areas. An integrated approach is needed to define the main questions to be addressed and how animal biosciences can provide some of the answers.

The dairy KT team provided a challenge of 90% of the Irish dairy herd calving in six weeks – it would be interesting to explore if the Animal and Bioscience team could help deliver the science required behind this (management, nutrition, genetics, and disease control). Similar targets might be identified through other KT groups for the drystock sector.

The potential uses of the new animal facility did not seem clear, perhaps in part due to planning and budgeting decisions being delayed. This is a large financial investment that needs to be exploited to the maximum. The group currently undertake animal studies in the facilities of partners in other countries (e.g. the USA) and this should not be discouraged. The capital investment by Teagasc however, must be seen as an opportunity that many would be envious of. Its use must be clearly linked to scientific vision and income generation to ensure the sustainability of the facility and staff.

4.5 Conclusion

The PRC recognises that the Animal and Bioscience Department is recently formed and, in this context, the overall quality of research was rated as very good, with evidence of some world class outputs. However, a cohesive and persuasive vision and mission for the Department was not evident to the PRC. The PRC recommends that the Department develops a much more integrated approach across the organisation as a whole to enable effective linkages with other research and KT departments.

Peer Review Committee Score for the Animal Bioscience Department (1-5)	3
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4.6 Recommendations

Develop and communicate a cohesive and persuasive vision and mission for the Animal and Bioscience Department that appropriately leverages the resources and contributes to the endeavours of the other AGRI departments.

Review the role of the Animal and Bioscience Department to improve linkages with other departments (including pigs) and develop a more cohesive approach within the AGRI programme. The review should also consider opportunities to develop collaboration with other industry organisations.

5. Review of Livestock Systems Department

The Livestock Systems Department has a clear objective to generate new knowledge focused on increasing both the profitability and sustainability of Irish dairy, beef and sheep farms. The Department seeks recognition as a leading international authority on the impact of relevant technologies on the profitability and sustainability of pasture-based livestock systems. Such recognition is sought to provide the dual benefits of ensuring its activities are at the level of best practice as reflected by scientific merit, and to enable their active membership in the international scientific community in their areas of endeavour. This latter achievement maximizes external funding as well as collaborative research opportunities at national and international levels.

The strategies for achieving their objectives include interaction with industry stakeholders in the dairy, beef and sheep industries, to ensure that their research activities are relevant to industry needs, are adequately funded, and importantly, to facilitate widespread adoption of their findings.

The research strategies include the development and application of computer models that capture existing knowledge and exploit it for purposes of decision support. These models facilitate the design and implementation of farmlet studies that provide new knowledge to improve computer models, particularly in capturing interactions that commonly exist between animal, plant and economic circumstances at the level of individual farms and the national economy. Links with other Teagasc, national and international research programmes and individual scientists leverages knowledge and expertise to assist in the development of sound science programmes in Livestock Systems. Many of these endeavours have been built up from successful historical activities with a dairy cattle focus. These activities are somewhat less mature in their applications to beef cattle and even less so in sheep systems. There are considerable opportunities in those production systems.

International recognition is achieved by collaborative activities, and by publication of findings in peer-reviewed international journals. This has been no easy feat, as farmlet and other systems studies have historically been difficult to publish in scientific journals. This remains the case for some of the specific endeavours being researched by the group.

Knowledge transfer is being achieved through field days on farmlets and demonstration farms, and through close interaction with the Dairy KT group, and to a lesser extent with the Drystock KT group.

5.1 Reflection on Quality

The farmlet studies reflect consideration of real-life industry problems of economic performance and appear to have been both well designed and well implemented. Systems studies are not easy to either design or implement, and this Department has demonstrated world leadership in doing this with dairy cattle. It has an accelerating track record of quality publications of international interest and relevance.

The Department has competent leadership and strong team spirit, reflecting a history of “can do” spirit and consistent achievement, despite structural and organizational challenges outside the Department.

5.2 Reflection on Productivity

The group has a higher priority on industry implementation than on publication in scientific journals, but has nevertheless achieved a peer-reviewed productive output as good as any of the other Departments in this programme.

5.3 Reflection on Relevance

This research is closely aligned to national agri-food priorities, most closely in the dairy area, and to a lesser extent in beef cattle and sheep.

5.4 Reflection on Vitality, Feasibility, and Vision for the future

The Department has demonstrated successful leverage of outside funds, despite some management challenges outside the control of the Department. The Department demonstrates evidence of strategic thinking and planning in relation to immediate and future research and knowledge transfer needs.

5.5 Conclusion

The Livestock Systems Department is doing world-leading research, motivated by immediate and future real-life issues facing Irish agriculture. Researchers are working at the forefront of their field internationally, and are communicating their results in peer-reviewed scientific journals. Furthermore, their research is having an important and substantial impact in the field. The Department would benefit from lifting its level of achievements in sheep and in beef cattle activities to more closely mirror its achievements in dairy production systems.

Peer Review Committee Score for the Livestock Systems Department (1-5)	5
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5.6 Recommendations

The research team activities driven by immediate and future farm needs should continue, and effort should be invested in improving the application of science and technological developments from the Grassland Science and Livestock Systems Departments to the beef and sheep sectors.

6. Review of Pig Development Department

The Pig Development Department caters for research, knowledge transfer and training in pig production. The department includes five advisors, one of whom is a specialist advisor, two permanent researchers, two contract researchers, eight Walsh Fellows and six farm staff. This is a small group with very limited staff resources which will be depleted even further in the coming months with the retirement of two advisory staff.

Despite this, the group is very cohesive with researchers and advisors working very well together as a team. However, the researchers suffer from not being more closely linked to the Animal and Bioscience Department. This could be of particular value for research areas such as feed efficiency, reproduction and animal welfare, research areas where the Animal and Bioscience Department is strong.

6.1 Reflection on Productivity

The researchers are at the forefront of pig research and have achieved a good range of productive outputs. They have produced 73 peer reviewed articles in the last five years. This corresponds to approximately 12 papers/year with a publication rate of 5.9 publications/FTE. There has been increasing emphasis in the last number of years on publishing high impact journals. However, some of their work is still published in very low impact journals. Whilst there is good collaboration between this group and other national and international research groups, there does not seem to be any collaboration with the Animal and Bioscience Department.

Knowledge transfer to farmers is very impressive and there is good evidence that this is impacting on the number of pigs produced per sow per year. However, the PRC would have liked to see how this knowledge transfer actually works on the ground. The Department's work on education is highly recommended, particularly given the very limited resources available.

6.2 Reflection on Relevance

The objectives of the Department are to: (i) increase profitability and competitiveness of the Irish pig sector by minimizing production costs; (ii) achieve full compliance with legislation in relation to pig welfare and environmental protection; (iii) produce pig meat to the highest standards of quality and food safety; and (iv) up-skill new and existing pig unit staff. These objectives are very appropriate to the sustainability of the Irish pig industry.

However, the PRC considers that the research presented in the presentations and in the peer review report does not clearly support all the objectives given.

The relevance of the past research presented was particularly obvious for compliance with legislation in relation to pig welfare and producing meat of the highest standards of food safety, and up-skilling new and existing pig unit staff. However, it was not as clear to the PRC, how past research has impacted on increased profitability and competitiveness of the Irish pig sector through minimizing production costs. Pig feed prices have been high for some time and it has been known for years that Irish feed costs were higher than our European counterparts. Very little research seems to have been done on reducing feed costs or on reducing environmental load, other than slurry handling. The welfare work on housing is quite comprehensive; however, the PRC considers that this work seems to lack a focus on reproductive performance and housing type; work which is badly needed by the industry.

6.3 Reflection on Vitality, Feasibility and Vision for the Future

There will be an increasing global demand for meat over the next 20 years and pigmeat is going to play a major role in this demand. The overall future for pigmeat is bright. However, the PRC considers that it is not clear what role this research group will play in meeting the targets set in Food Harvest 2020 ie increasing the sow herd from 150,000 to 200,000, or increasing national sow productivity to 24 pigs per sow per year.

The PRC did not obtain a clear vision of future research priorities for the Department. There is a lot of information available in the literature on matching diets to meet the pig's nutritional requirements in order to reduce feed costs and environmental impact, on housing, environmental enrichment, reducing phosphorus and organic nitrogen by feed, as well reducing slurry volumes. This work does not need to be repeated. A bigger issue for this group is why the industry has not taken on and used this research. This is a challenge for the KT group. The link with the pig industry is paramount to the success of this group in the future and this needs to be exploited in order to finance staff and increase critical mass.

6.4 Conclusion

The Pig Development Department is a very cohesive group with researchers and advisers working well as a team. Knowledge transfer to the pig industry is particularly impressive with a major impact on the number of pigs produced per sow per year on Irish farms. The PRC considers that close linkages with the pig industry are essential to the future success of this group. In this context, the PRC considers that the Department needs to develop a longer-term (5-10 years) vision of future research priorities and targets, and this should be undertaken in conjunction with industry.

Peer Review Committee Score for the Pig Development Department (1-5)	3
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6.5 Recommendations

This group needs to put forward a very clear vision of its research strategy for the future. It needs to have a good hard look at how they use their resources. The link to the industry and the exploitation of external funds is paramount to its success. The research work done by this department and else where needs to be exploited by the pig industry through the KT group. There is also scope to liaise with Teagasc Ashtown in improving the added value of pork and pork products.

Review the future research needs of the pig industry, including consideration of funding arrangements and best methods of delivery, through a joint Industry / Teagasc group.

7. Review of Dairy Knowledge Transfer Department

The Dairy KT Department provides clear leadership and support in the overall design, planning and delivery of the national dairy advisory programme. The Department has an intermediate position between research and front line advisers, providing the latest technical and research information to advisers and also feeding back information from farmers and advisers to research scientists. The work programme and key objectives of the Department are extremely ambitious with overall national dairy herd targets for pasture utilization of 10 t DM/ha and reproductive performance targets of 90% of the herd calved within a six week period.

7.1 Reflection on Quality

The PRC considers that staffing levels within the Department are appropriate given the remit of the group. The Department has a significant international profile, particularly in the UK, New Zealand and Australia. Whilst the Department plays a very important role in organizing highly effective national events and impacts on approximately 60% of Irish dairy farms, the PRC considers that increased use of social science and application of knowledge of factors influencing behaviour change could be important tools in improving the uptake of knowledge throughout the Irish dairy industry. The PRC also recommends that consideration should be given to expanding the Group's profile to wider European and international audiences through appropriate publication and conference participation.

7.2 Reflection on Productivity

Overall, the PRC considers that the Department have been very productive and have had a real impact on the majority of Irish dairy farms. However, the PRC have some concerns about the sustainability of expanded discussion group participation resulting from the Dairy Efficiency Programme (DEP), particularly given the eventual reduction in DAMF funding for this programme. The PRC cautions against direct participation of the Department in research projects as this could result in a reduction in resources allocated to key objectives. Nonetheless, the PRC recognises and encourages the need for staff to maintain close contact with the wider research community, particularly those involved in pasture-based dairy production.

7.3 Reflection on Relevance

The stakeholder involvement in establishing priorities is an advantage and strength and the Department is focused on topics highly relevant to the issues faced by Irish dairy farmers ie grassland, breeding, and financial management. The Department is encouraged to maintain strong and effective working relationships with the provider of services to dairy farmers.

7.4 Reflection on Vitality, Feasibility and Vision for the Future

The Department has an extremely important role to play in the expansion of the dairy industry by providing an improved understanding of the key principles for sustainable and profitable dairy farming.

7.5 Conclusion

The Department is very well integrated with the Grassland and Livestock Systems Departments and it is clear that interactions with these departments are highly effective and need to be maintained and further developed in the future. The PRC considers that the relationships with the Drystock KT and the Animal and Bioscience Departments should be developed and enhanced.

Peer Review Committee Score for the Dairy Knowledge Transfer (KT) Department (1-5)	4
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7.6 Recommendations

Explore opportunities to further improve and develop links between the Dairy KT programme and social science research to obtain a better understanding of factors influencing behaviour change, and the barriers to adoption of new technologies.

Develop improved linkages with the Drystock KT and the Animal and Bioscience departments.

8. Review of Drystock Knowledge Transfer Department

The Drystock KT Department comprises four cattle and three sheep specialists. They work with 35 Drystock B&T Advisers directly targeting approximately 6,000 cattle and sheep farmers and providing services to the wider farming population through a programme of public events and media communications. The principal role of the Department is to provide leadership in developing technologies and decision support tools and in planning and helping deliver the national extension programme to cattle and sheep producers. The focus is on increasing production efficiency from grazed grass, improving breeding efficiency and accelerating the rate of genetic gain. The programme also addresses increased adoption of best practice in relation to animal health and the development/modification of production systems.

The PRC recognises the very positive market outlook which currently exists for the drystock sector and the potential opportunities for efficient Irish producers. With proactive leadership and technical support from the KT Department, Irish drystock farmers can take advantage of the more benign market environment and be well positioned to achieve the challenging targets set in *Food Harvest*. The PRC acknowledges the existence of policy and structural factors which have limited the potential for impact by this group in the past, but consider that future policy and market environments will be much more conducive to the development and transfer of new technologies to the drystock sector.

8.1 Reflection on Quality

The Department is responsible for developing a very comprehensive national programme of events and communications, some of which the Department itself is directly responsible for delivering and others of which are delivered through the B&T Advisory Service with support and mentoring from the Specialist Team. The Department has a high national profile, with members contributing regularly to national conferences, industry events, policy working groups and media communications. The PRC considers that to date the impact of new technology in the drystock sector has been limited, but acknowledges the existence of external factors that have contributed to this. However, the success of the industry-led BETTER Beef Farm Programme demonstrates the potential that exists in the sector in regard to uptake of new technology and highlights the urgent need to extend the benefits of this programme to a much wider group of farmers.

8.2 Reflection on Productivity

The PRC considered that overall the Department's productivity was good, as demonstrated by the output of a very wide range of popular and technical publications in the national farming press and local newspapers, as well as the publication of regular newsletters, bulletins and other useful literature. This output is complemented by regular presentations at conferences, open days and other public fora. The Department also provides ongoing training, mentoring and support for the B&T Advisers. Whilst the PRC is not in a position to assess the quality of the publications and other contributions, the fact that members of the Team are invited to present regularly at national conferences and are involved in various national policy fora supports the belief that their contribution has a high national standing.

8.3 Reflection on Relevance

Overall, the PRC considers that the stated priorities of the Programme are focused and relevant. As already stated, the focus is on increasing production efficiency from grazed grass combined with improved breeding efficiency and accelerating the rate of genetic gain as drivers of output and profitability level. The increasing level of stakeholder involvement in programme planning and delivery is welcome as a means of ensuring that priorities fully reflect the needs of stakeholders. In particular, the development of the industry-led BETTER beef and sheep farms serves to further enhance programme relevance. In particular, the very positive impacts of the BETTER Beef Programme must be extended to a wider group of farmers through the development of cost-effective models. The PRC also notes the very positive impact of the Derrypatrick Farm in identifying realistic performance targets and

demonstrating the technologies needed to achieve these targets. This initiative must in future become a critical resource in the work of the KT Department.

8.4 Reflection on Vitality, Feasibility and Vision for the Future

The KT Department has the potential to meet the knowledge and technology needs of the drystock industry thereby enabling it to meet the ambitious targets set in *Food Harvest 2020*. However, the Department needs to develop a clear vision for the long-term development of the sector and for its role in helping to achieve that vision. In particular, the Department must build on the success of the BETTER Farm Programme. This will involve greater targeting of clients, setting realistic performance targets, effective monitoring of these targets, as well as developing new advisory tools that will enable the lessons of the BETTER Farm Programme to be extended to a wider cohort of farmers. The Department must also capitalise on the new programme structure within Teagasc by building stronger links with the key research departments and drawing on the potential of the common technology platforms in grassland, nutrition and animal bioscience.

8.5 Conclusion

The PRC considered that, overall, the Department's productivity was good, but there is a need to develop a clear vision for the long-term development of the sector and for its role in helping to achieve that vision. The Department needs to strengthen linkages with other research departments in order to ensure that the benefits of the integrated programme structure and the common technology platforms are speedily translated into impacts on farms. In particular, there is scope for better linkage with the Animal & Bioscience Department to ensure that scientific solutions are being developed for some of the sector's longer term issues. Linkages also need to be strengthened with the Dairy KT Department to avoid duplication of effort, and ensure greater critical mass in the development of new advisory tools.

Peer Review Committee Score for the Drystock Knowledge Transfer (KT) Department (1-5)	3
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8.6 Recommendations

The Department needs to develop a comprehensive vision for the future of the drystock sector, based on aligning the national programme with Food Harvest 2020 targets and focusing on the 5,000 beef farmers with over 40 cows and the 5,000 sheep farmers with over 200 ewes.

Extend the industry-led BETTER beef programme using a cost-effective model, initially to the 470+ farmers who currently complete profit monitors and set realistic targets for improvement and output from this group.

Develop basic software tools to facilitate farm planning on drystock farms and situate these tools in the context of an overall economic model for the sector. (If there is a resource constraint delaying the development of an economic model for the drystock sector, then the PRC recommends that a Walsh Fellow should be appointed to speed up the process).

Strengthen the sheep KT programme by allocating leadership responsibility to one of the KT specialists.

Build future KT effort around the discussion group model, which is being successfully applied in the dairy sector. It may also be necessary for Government to provide a similar stimulus to that provided for the successful DEP in dairying.

Free up advisory time in lower priority areas and transfer to the higher priority B&T Drystock Advisory Service.

Consider developing a 'Greenfield farm' for beef employing the same model as for dairying.

Strengthen linkages with research departments to ensure that the potential benefits deriving from common technology platforms are fully realised for the benefit of the drystock sector.