
Teagasc Animal and Grassland Research and Innovation Programme (AGRIP) Peer Assessment 2017

Final Report

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1. Introduction

1.1. Overview of Teagasc Evaluation Process

Teagasc is committed to undertaking peer assessments of its research and knowledge transfer programmes on an approximate 5-year cycle. The purpose of such assessments is:

- 1) To 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.
- 2) To determine the quality and productivity, relevance and viability of the research and knowledge transfer programme.
- 3) To identify how the research and knowledge transfer programme could be improved to make best use of resources.
- 4) To provide accountability for public funds expended.

Each assessment examines the management, research and knowledge transfer activities of individual programmes. The management assessment focuses on governance, leadership and strategy. The research and knowledge transfer programme assessment focuses on its quality and productivity, relevance and viability. The assessment is both retrospective and prospective with an emphasis on the latter in the recommendations so as to help achieve improvement in the future based to some extent on knowledge of the past.

The assessment is undertaken under the auspices of the Teagasc Director, senior management and the Teagasc Business Planning and Performance Evaluation Department (BPPED), by a Peer Assessment Panel (PAP) of national and international experts drawn from outside the programme being assessed. The management and staff of the programme prepare a Programme Description and Self-Assessment document in advance of a site visit by the PAP. After the site visit, the PAP produces a written assessment report with recommendations which is presented to the Teagasc Director of Research. An action plan is drawn up by management of the programme being assessed on foot of the report and submitted to senior management and the Teagasc Authority.

1.2. Overview of the AGRIP Programme

Vision and objectives

AGRIP's vision is to be an internationally known and recognised Animal and Grassland Research and Innovation Programme that produces new leading edge technology and models to drive the agri-food industry.

The objectives of AGRIP are to:

- Increase the profitability and competitiveness of Irish animal production systems.
- Improve the environmental sustainability of Irish animal production systems through improved nutrient use efficiency and reduced 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 animal improvement (cattle and sheep) through breeding, genetics and genomics,
- Contribute to the achievement of the targets set out in Food Wise 2025.

Structure and resources

AGRIP consists of three research departments: two knowledge transfer departments and one pig development unit. The programme is spread across three main locations: Athenry, Co. Galway (mainly sheep production); Grange, Co. Meath (mainly beef production); and Moorepark, Co. Cork (mainly dairy production). Grass and clover breeding is located at the Crops Research Centre in Oak Park, Co. Carlow. The staffing, funding and expenditure levels of AGRIP over the period 2013-2017 are outlined in Tables 1 and 2 below.

Table 1 : Staff at AGRI Programme Level (Full Time Equivalents)					
	2013	2014	2015	2016	2017
Research Staff					
- Permanent Researcher	35	33	34	35	36
- Contract Researcher	19	18	16	11	11
- Post Doc Researcher		12	16	16	14
- Walsh Fellows	92	97	99	104	98
KT Specialist Staff					
- Specialist	15	15	15	16	15
- Advisers (Permanent)	4	4	5	5	6
- Advisers (Contract)	2	2	2	2	2
- KT Walsh Fellow					
Support staff					
- Technologist Permanent	6	5	6	10	7
- Technologist Contract					5
- Technician Permanent	41	46	48	43	40
- Technician Contract					13
- Admin	9	10	11	10	11
- Farm/Maintenance/domestic	68	66	61	61	53
Total Research & Specialist Staff (including Walsh Fellows)	292	310	312	313	312
Total Research & Specialist Staff (excluding Walsh Fellows)	200	213	213	209	214

Table 2 : Funding (internal and external) and Expenditure: AGRIP Programme					
	2013 €000	2014 €000	2015 €000	2016 €000	2017 €000
Total Funding (€)	22,609	22,770	23,492	23,114	23,460
Core Funding (% of total)	14,886 (66%)	14,132 (62%)	13,904 (59%)	13,403 (58%)	13,080 (55%)
External funding (% of total)	3,429 (15%)	4,465 (20%)	5,388 (23%)	5,392 (23%)	5,374 (23%)
Livestock Income & Farm Operational Receipts (% of total)	2,819 (12%)	2,465 (11%)	2,344 (10%)	2,468 (11%)	3,354 (14%)
Commodity Levies (% of total)	1,475 (7%)	1,708 (8%)	1,856 (8%)	1,851 (8%)	1,832 (8%)
Total Expenditure (€)	22,609	22,770	23,492	23,114	23,640
Pay Costs (% of total)	11,856 (52%)	11,681 (51%)	11,872 (51%)	11,816 (51%)	12,412 (53%)
Non-pay costs (% of total)	10,753 (48%)	11,089 (49%)	11,620 (49%)	11,298 (49%)	11,228 (47%)

Total Income (% of total expenditure)	7,723 (34%)	8,638 (37%)	9,588 (40%)	9,711 (42%)	10,560 (45%)
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Explanation:

- Core funding: funds provided directly from the state grant of Teagasc
- External research grants: funds received in competition from national and international funding agencies (DAFF, EPA, FP7, etc)
- Contracts: funds from third parties for specific research activities, e.g. industry, charities, etc
- Other funding: include laboratory analysis income, interest from property, legacies, etc

2. The assessment panel and assessment procedure

2.1. Scope and objective of the assessment

The Peer Assessment Panel (PAP) was tasked with assessing Teagasc's Animal and Grassland Research and Innovation Programme (AGRIP). In accordance with the *Revised Standard Protocol for the External Independent Peer Assessment of Teagasc Research and Knowledge Transfer Programmes*, the assessment focused on the six departments of AGRIP:

- Animal Bioscience
- Grassland Science
- Livestock Systems
- Pig Development
- Drystock Knowledge Transfer
- Dairy Knowledge Transfer

The assessment covers the period 2013 – 2017. In accordance with the *Revised Standard Protocol*, the panel's task was to assess AGRIP's research and knowledge transfer (KT) activities using the following criteria: quality and productivity, relevance to society and viability, or the extent to which the programme is prepared for the future. The latter criterion also considers the governance and leadership skills of the programme's management. The assessment also included the Walsh Postgraduate Fellowships Programme and research integrity and diversity.

The PAP graded the overall programme and individual departments under each criterion employing the following qualitative categories: excellent, very good, good and unsatisfactory. For a description of the criteria see Appendix 3. The panel provided a descriptive assessment of the Walsh Postgraduate Fellowships Programme, research integrity and diversity.

2.2. Composition of the assessment panel

The panel comprised seven experts reflecting the diversity of the AGRIP programme.

- Prof. Dorian Garrick, Chief Scientist, AL Rae Centre, Institute of Veterinary, Animal & Biomedical Sciences, Massey University, New Zealand (Panel Chair).
- Prof. Danny Donaghy, Institute of Vet, Animal and Biomedical Sciences, Massey University, New Zealand.
- Prof. Michael Ellis, Department of Animal Science, University of Illinois, USA.
- Dr. Jean-Francois Hocquette, French National Institute for Agricultural Research (INRA).
- Dr. Sean McCarthy, Services Manager, Kerry Agribusiness, Ireland.
- Mr. John Kehoe, Farmer, Carlow, Ireland.
- Dr. Lance O'Brien, Head of Strategy & International Relations, Teagasc.

The secretariat was provided by Dr Kevin Heanue, Evaluation Officer, Teagasc. A short profile of each of the PAP members is provided in Appendix 1.

2.3. Independence

PAP members signed a statement of impartiality and confidentiality. In the statement, they confirmed that they had no relationships, connections or affiliations with AGRIP or any of its departments that would lead them to feel they would be unable to conduct an independent and impartial review. In signing the statement the members also declared that they fully understood the confidential nature of the assessment process.

2.4. Data provided to the panel

The following documentation was provided to the PAP prior to the site visit:

- The *Revised Standard Protocol for the External Independent Peer Assessment of Teagasc Research and Knowledge Transfer Programmes*.
- Foodwise 2025, the Irish Government's Agri-Food Strategy.
- Teagasc Technology Foresight Report 2035.
- Teagasc Statement of Strategy 2017-2020.
- AGRIP Business Plan 2017.
- The schedule for the site visit.

The AGRIP self-assessment document was also sent prior to the site visit. This document contained a summary of recommendations and subsequent actions from the previous AGRIP peer assessment report of 2011; reflections on each of the six departments together with detailed appendices with staff profiles, lists of publications, funding, projects and completed Walsh Fellowships; sectoral road maps, tables outlining budgets and expenditure; indicators of reputation and tables clarifying the breakdown of research and KT staff.

2.5. Procedure followed by the panel

The documentation outlined above was considered by the PAP prior to the site visit. The PAP commenced the assessment on the evening of Wednesday November 1st and continued until the afternoon of Friday November 3rd (see schedule of site visit in Appendix 2). At the outset of the site visit, the PAP received thorough scene-setting overviews of Teagasc and AGRIP from the Teagasc Director, Professor Gerry Boyle, Director of Research, Dr Frank O'Mara and Head of AGRIP, Dr. Pat Dillon. This provided the panel with insights into recent organisational changes, the Irish policy landscape, staffing issues, funding levels and drivers of change. The role and remit of Teagasc in general, and AGRIP in particular, were outlined. The PAP was also alerted in broad terms to the importance of Food Wise 2025, Food Harvest 2020, Teagasc Technology Foresight and the Teagasc Statement of Strategy 2017-2020.

On the morning of Thursday November 2nd, the PAP agreed as to how the assessment would proceed, the different responsibilities of panel members and how the input for the assessment report would be collated during the site visit.

In addition to a series of presentations by and discussion with AGRIP staff during the site visit, the PAP also met with a group of farmer stakeholders. Also, on the morning of Friday November 3rd, the panel had an opportunity to inspect some of the AGRIP facilities, with some members visiting the Pig Development Unit and others visiting Curtin's Research Farm.

On the final afternoon, the panel chairman presented a verbal exit report to the Teagasc Director, Director of Research and AGRIP management.

2.6. Remarks about the assessment process and Evaluation Protocol

The assessment covered the overall programme and the six constituent departments – (Animal Bioscience, Grassland Science, Livestock Systems, Pig Development, Drystock Knowledge Transfer and Dairy Knowledge Transfer). The projects presented to the panel involve cross-department collaboration, and as a consequence, a number of them were presented more than once, which presented some difficulty in terms of understanding the contributions of the different departments. The review team recommend that in future reviews the material be presented in a mutually exclusive manner or that the review focus on the projects rather than on the Departments.

The review team were provided with a considerable amount of documentation in advance of the site visit, including a 259 page peer assessment document. The PAP members invested considerable time in familiarising themselves with these documents prior to the face-to-face meetings. A printed version of the peer assessment document was provided at the meeting but it contained some additional material relative to the electronic version. The PAP were subsequently criticised for not being familiar with that additional material. In future reviews it is recommended that there is careful consideration of the nature and version control of material circulated to the review team both in advance and on site.

The AGRI programme comprises research, knowledge transfer and education – the latter including activities at undergraduate level at Moorepark, and postgraduate levels at all sites and in all Departments. However, given different expectations about the extent of coverage to be given to undergraduate education in the review, there was relatively little consideration of such an education component in the material presented to the PAP, other than brief reference to the Walsh Fellowships which consider only postgraduate rather than undergraduate education. Nevertheless, undergraduate education in AGRIP was verbally discussed during the on-site meetings, and was communicated to the PAP by some personnel as an area of concern in terms of resource allocation. In future AGRIP reviews, undergraduate education should explicitly form part of the review if it involves significant effort for some of the AGRIP staff.

A key output metric is the number of papers produced per permanent full-time equivalent staff member by department. However, the panel queried this metric in view of the fact that many peer reviewed papers involve participants from more than one department and include staff not in permanent full-time positions. Further, a large proportion of the peer-reviewed papers involve Walsh Fellows as co-authors. The review team recommend that in future reviews more effort is placed in presenting summaries of outputs, such as peer-reviewed publications, in ways that are much more meaningful for the review. Authors from Teagasc should be underlined or otherwise represented in the publication list. Depending upon the journal and paper contributors, lead investigators are sometimes recognised as first author, and in other cases recognised as last author, and these details are not easily apparent to the PAP in the material as presented in the self-assessment document. Metadata such as number of papers designed or lead by full-time Teagasc employees as opposed to post-doctoral or Walsh fellows should be provided.

The scoring systems were four point with the top score being excellent. Reviewers are often reluctant to allocate the most extreme scores on either end of the scale, as that would compromise their ability to identify a better or worse score for a subsequent grading. Generally, excellent is reserved for being unusually good, surpassing ordinary standards, for

example, being in the top 5%. Using this definition, it is not therefore possible that the majority of activities could receive an excellent score. In contrast, the review team used a score of excellent to indicate that outputs, given the available resources, were in line with best international practice. A score of very good indicated that there were some aspects that needed improvement. The scoring system for viability in knowledge transfer was related to the level of resourcing for the future, and that definition was problematic. For example, ratings of: outstanding; strong; competent; needing improvement; and unacceptable represent an alternative rubric. The review team recommend that the scoring process, and the descriptions of performance relevant to each score, be better defined in subsequent reviews. This is critically important to ensure that the readers of the review are interpreting the scores in the same manner as intended by the PAP.

The review team provides their commentary and scores on the material as presented to them for the review, recognising the limitations described above.

3. Assessment of the AGRI Programme

Food Wise 2025 provides an ambitious vision for the growth of the Irish agricultural economy, and outlines the manner in which the sector can be supported to achieve its aspirations for growth to 2025 and beyond. Sustainable grass-based production systems enjoying a favourable animal health status are recognised as strengths which must be enhanced, while addressing challenges such as green house and air emission targets, biodiversity loss and reduced water quality.

The research, education and knowledge transfer activities of the AGRI programme will play critical roles in making this vision a reality. Teagasc is nationally and internationally recognised as the knowledge provider of choice for Ireland's agri-food sector. The AGRI programme is one of four operational programmes that comprise the Teagasc research directorate, each programme also including a knowledge transfer directorate. The AGRI programme is a significant component of Teagasc's support for science-based innovation to underpin profitability, competitiveness and sustainability.

3.1. Research quality and relevance as whole

The Head of Programme presented an overview of the Programme, including vision, mission, objectives and overall strategy. The programme appears to have good connection with government and EU drivers of change, including the very relevant Food Wise 2025 report. The portfolio of work includes high quality research and knowledge transfer activities that will make a significant contribution to meeting the goals of Food Wise 2025, and those of Teagasc outlined in the Technology Foresight 2035.

Some of the scientists are at the forefront of their field internationally, and accordingly some of the components of the programme are world leading, particularly those involving applied research, most notably that associated with production and/or profitability. The review team was impressed by the research and knowledge transfer activities communicated in the oral sessions as they relate to improved farm production and profitability. In addition to production and profitability drivers from the livestock industry, research should be more explicitly driven by current and anticipated future consumer and societal demands, as recognised in the Teagasc Statement of Strategy and other documentation provided to the PAP. There was some suggestion that this might be occurring, for example in some of the written documentation, but less so in the oral highlights presented to the PAP. Linkages with societal issues including consumer perceptions of food production systems, labour, welfare,

food, and the environment (including greenhouse gases and water quality), need to have higher profile.

Although there was some indication of international collaborations, international linkages were weak or not apparent in other areas. For example, there was no mention in oral presentations or in the self-assessment documentation of international organisations such as the Animal Task Force (ATF), Functional Annotation of Animal Genomes (FAANG), and Animal Trait Ontology of Livestock (ATOL). Linkages with European Association of Animal Production (EAAP) were mentioned, but only in relation to contributions of individual scientists. Appendix 10 of the self-assessment document is titled affiliations and collaborations, but this appendix was blank in the 259 page electronic version as circulated to the PAP. A printed version provided on site included a list of outside visitors to AGRIP in that Appendix, but did not indicate any details of the nature of collaborations.

Meeting the five communicated objectives for AGRIP clearly requires knowledge transfer. However, neither the mission nor vision at the level of the overall programme as presented in the self-assessment documentation and oral presentation included knowledge transfer, despite its prominence within some of the individual Departments, in the self-assessment document and oral presentations by the six departments. This may have only been an oversight, as the PAP recognised that research and knowledge transfer need to be appropriately balanced to make the most efficient use of AGRIP resources, but that balance was not always made apparent during the review.

3.2. Viability of the programme

Despite the obvious successes of the overall programme representing the collective activities of the six departments, the organisation and management of the overall programme and its six constituent Departments needs to be more convincing. There appeared to lack a clear, formal structure to the programme, particularly as regards the links between departments, and in terms of the manner of communication within and between departments, and among personnel at the various sites. It was not clear why pig research was disconnected from Animal Biosciences. Although documents such as the FoodWise 2025 report, policy issues such as the abolition of EU milk quotas, and global concerns about food security clearly influence possible targets for AGRIP, it was not clear as to the strategic process used to prioritise research or knowledge transfer activities at the AGRIP as opposed to individual Department level.

Although the AGRI programme has been very successful in some of its applied research and knowledge transfer activities, and achieved an enviable international reputation, the PAP felt some strategic aspects lacked transparency. It was not clear to the PAP how the “pipeline” works in a strategic sense, to ensure a balanced two-way flow of knowledge among all stakeholders. That is, providing knowledge discovery and transfer from research discoveries to farmers and consumers, while simultaneously returning signals from consumer or producer problems or concerns back to research funding and discovery activities. Some of the operational aspects of parts of the pipeline were detailed but these were operational and were in relation to individual Departments. Further, the written and oral presentations to the PAP, stakeholder discussions, and individual researcher responses during question times, provided conflicting information as to how this pipeline operates from a strategic perspective. It was not clear that the current knowledge transfer processes were always fully integrated with the research and education activities. For all these reasons, the review team makes a number of recommendations in relation to reviewing the structure of AGRIP.

It was not clear how resources were allocated to undergraduate teaching, nor to meet the needs of graduate teaching or graduate research beyond those resources directly provided as part of each Walsh Fellowship.

Overall, the programme seemed to be adequately resourced in relation to its activities, but the reduced proportion of permanent staff and the increased proportion of non-permanent staff, including key support staff (technicians and farm operatives), creates risks and uncertainty for the future. Reliance on researchers with short-term contracts raises concerns relating to the retention of key individuals in what is a very competitive job market for applied animal scientists. Increasing the size of some programmes, including two recently awarded large-scale research grants and a substantial increase in Walsh Fellows will increase the need for a wide range of resources and will require expertise and leadership. Research priorities are changing rapidly and it is not clear if the group has the required expertise to address all new research areas. Hiring of researchers in new disciplines and re-training of existing personnel will be needed but there was no plan communicated to the PAP indicating how Teagasc would achieve this.

It was apparent during the review that the IT and communication resources are inadequate.

3.3. Assessment of PhD training within the programme

The Walsh Fellowships Programme appears to be extraordinarily successful in terms of training PhD and MS students in various activities related to Teagasc goals. Many of the peer-reviewed papers listed in the review material seem to have been generated as part of the activities associated with Walsh Fellowships. Some of the graduated Walsh Fellows have gone on to post-doctoral positions within AGRIP. The review team felt that the real and substantial contribution of the Walsh Fellowships to the research and extension activities in the various departments was not adequately recognized in the material as presented for review.

Improved metrics summarizing PhD completion times, publication rates, and lead supervisors and departments of Walsh Fellows would be helpful, as would metrics reporting the nature of employment of graduated Fellows. Appendix 11 provided details on the individual fellows, and Appendix 8 included the list of individual publications, but additional metrics based on the analysis of these individual records would have been helpful.

3.4. Assessment of integrity policy of the programme

The review team had no concerns about the integrity policy of the programme – it appeared to be in line with best practice.

3.5. Assessment of diversity policy of the programme

The review team had no concerns about the diversity policy of the programme – it appeared to be in line with best practice. Much of the workplace diversity appears to result from the Walsh Fellowships. However, it should be noted that no formal documentation of diversity metrics was provided to the review team.

3.6. Recommendations

Recommendation 1: Review the management structure and communication systems to enhance collaboration across departmental units and better facilitate two-way exchanges between researchers, knowledge transfers and their stakeholders and clients.

- The management structure needs to be resilient to staff changes
- The management structure needs to accommodate the additional activities associated with administering two new large research grants.
- Collaborations did not appear to always arise and be communicated through formal management structures, and if so, this fails to exploit the full research and knowledge transfer resources of the organisation.

Recommendation 2: Review the systems and processes used to identify industry problems, and manage the required research and knowledge transfer endeavours, to ensure that new and existing knowledge is efficiently transferred and applied.

- Review the process of identifying focus areas/issues within industry – to enhance the value of the stakeholder groups and other parties that identify industry issues
- The impact of research, hence return on investment, is severely hindered by the lack of accountability of knowledge transfer advisors to overall program objectives.
- The process by which industry weaknesses and opportunities were identified, studied, and addressed was not transparent, nor was it consistent across departments.
- For example, opportunities to research, transfer knowledge and adopt the use of calves produced in the dairy industry for the production of beef has not been recognised as a priority by either the dairy or beef groups despite its national significance.
- The link between research, knowledge transfer, specialists, advisers and farmers is not always functioning. For example, advisers are engaged in springtime scheme work at a critical time for farmers seeking guidance.

Recommendation 3: Investment in research, education and knowledge transfer activities must be justifiably balanced across species, and production systems, taking account of current and anticipated industry needs and consumer/societal concerns related to production quality and quantity, welfare, environment.

- A similar recommendation was made in the previous review (#1), and considerable progress has been achieved in the sheep and beef sectors, but continued efforts are warranted.
- Prioritisation of resources should be clearly outlined.
- Projects should maintain appropriate focus on aspects other than immediate pasture utilisation or production – taking due account of soil fertility, animal welfare, environmental issues, and social aspects of projects.

Recommendation 4: Strengthen the human resource component of the AGRI programme.

- Increase the proportion of permanent key staff across the entire range of research, knowledge transfer, technician and farm staff.
- Provide clear career paths for the most promising young staff.
- Increase the number of staff with expertise needed to meet new demands, such as those with statistical expertise, and with abilities to handle BigData including that expected from precision agriculture.

Recommendation 5: **Improve IT infrastructure and communication technologies to meet the current and future needs for research, education KT and administration.**

Recommendation 6: **Apply, and where necessary develop, common tools, methods and indicators to assess the impact of knowledge transfer programmes across the full range of production, welfare, social and environmental parameters in beef, dairy, sheep and pig programmes.**

Recommendation 7: **Ensure the AGRI programme maximizes the benefits that can be obtained from the Walsh Fellowships Programme across the range of research and knowledge transfer activities, including in the assessment of impacts of knowledge transfer.**

- While it was suggested this area had received some focus, it was unclear from the presentations how learnings were being utilised currently and where the focus might be going forward.

Recommendation 8: **Strengthen, or where appropriate establish, national and international collaborations to leverage research, education and knowledge transfer expertise.**

- For example, the Animal Task Force (ATF), EAAP, FAANG, animal trait ontology of livestock etc.

Recommendation 9: **Define the structure and resources required, and the roles and responsibilities of the research and knowledge transfer teams in relation to undergraduate education.**

- Determine how a focus on this area might impact on Industry needs in the short / medium term – environment, water quality etc.

3.7. Scores

Quality and productivity	Very good
Relevance to stakeholders	Very good
Viability	Good

4. Assessment of the Animal Bioscience Department

The Animal and Bioscience Department was formed in 2008 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 was 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.

4.1. Research quality & productivity

Animal Bioscience has about half of the permanent researchers in the programme (17 out of 35). The research programme is well-funded and a number of the staff are extraordinarily productive in terms of high-quality research publications.

The activities of the Department seem to be science driven, rather than strategically driven to meet the AGRIP objectives. There was evidence that the Department has made efforts to improve efficiency of resource use e.g., by sharing resources across the research sites.

The strategy outlined was very general and lacked enough detail for the PAP to judge if it was appropriate or achievable; it was not always clear how many of the strategic targets would actually be addressed in practice (e.g., “continuous staff training/retraining” and “be efficient – dynamic – responsive”).

4.2. Societal relevance

The activities of this Department seem to be science driven, and driven by funded projects, with no real evidence that the activities were strategically focussed on societal relevance. There did not appear to be a formal process for getting input from stakeholders in order to prioritize research objectives (see earlier comments relating to the AGRI programme).

The research activities did not seem to have balance across the various enterprises (dairy, beef, sheep and pigs). For example, there was no evidence of real engagement with the Pig Department.

There did not appear to be much focus on animal welfare, or on breeding to reduce the reliance on antibiotics, in the material as presented. The AGRI programme business plan for 2017 section on Animal biosciences does not mention welfare in any of its 2017 initiatives, and refers to initiating its first initiatives to reduce antibiotics use in its 2017 activities. Certain activities, such as the development of EBI and the COW index involve excellent examples of industry collaboration.

Overall, the relevance of the research activities of this department to the AGRI programme appeared to be variable. Those dairy and beef activities linked to other organisations such as ICBF are very relevant. There surprisingly appeared to be no research activities in common with the pig department.

4.3. Viability

The formal structure of the Department and the manner of its strategic interaction with other departments was not apparent. It was not clear how this Department fitted into the overall programme. Nevertheless, there was noticeable collaboration by some members with other departments and organisations. The review team were concerned that the structure of the Department may not be appropriate to meet a number of the key stated objectives, as evidenced for example by the lack of interaction with the Pig department.

4.4. Recommendations:

Recommendations 1, 2, 3, 8 and 9 are particularly relevant to this Department

4.5. Scores

Quality and productivity	Very good (ranging from Excellent to Good)
Relevance to stakeholders	Good to very good
Viability	Very good

5. Assessment of the Grassland Science Department

5.1. Research quality & productivity

The department presented a clear strategy for the future, which included key elements related to improving the productivity and sustainability of pasture production, but also addressing the environmental impact of pasture-based ruminant production systems. In general, its work represented very applied science with an excellent focus on productivity. Nevertheless, the group still managed to publish strongly, and to demonstrate good cross-departmental collaboration. The work tended to be data-driven with an evidence-based approach.

5.2. Societal relevance

The group demonstrates great focus with a clear target that then flowed through the whole programme. PastureBase and the pasture profit index are very beneficial industry resources championed by this Department along with its very practical and highly relevant grazing trials. Its links to Bord Bia / Origin Green are very important.

However, there was a concern that most research appeared to be production-focused and that more emphasis on environmental research and soil science was needed in the programme. Nevertheless, the water quality work at Curtin's farm is very relevant and needs to be built upon with more research of pastoral ecology in relationship with soil fertility.

The Department needs to enhance its links with Teagasc Johnstown in relation to research on water quality and other environmental issues.

5.3. Viability

The Department appears to be well-resourced at present, but with the recent award of two large research grants, additional infrastructure and other resources will be needed. There will be insufficient lab space for new projects and associated personnel. There will be a need for expertise in certain key areas for future research efforts such as big data analysis, statistics, and development/application of new grassland precision tools.

It was not clear where the expertise in basic ruminant nutrition resides within AGRIP. The only personnel in the self-assessment document indicating ruminant nutrition as their interest appear to be heavily involved in applied nutrition, and/or research outside the field of nutrition. Basic ruminant nutrition is obviously an extremely critical component of any applied ruminant production research and knowledge transfer programme. There is mention of ruminant nutrition in both the Grassland Science and Animal and Biosciences department's presentations, but the specific emphasis, focus, roles, and links between the two programmes was not clear.

There was evidence of good work in this department on knowledge transfer to farmers, but it appeared this was occurring independently of the knowledge transfer people in the knowledge transfer Departments.

The issue of reviewing IT, data management, big data and communications was a general recommendation, but is particularly relevant for this department.

5.4. Recommendations:

Recommendations 1, 2, 3, 5, 8 and 9 are particularly relevant to this Department.

5.5. Scores

Quality and productivity	Excellent
Relevance to stakeholders	Very good
Viability	Very good

6. Assessment of the Livestock Systems Department

6.1. Research quality & productivity

This Department has a relatively broad programme that cuts across other departments, particularly Grassland Science, Animal and Bioscience, and the two focussing on knowledge transfer. It is represented by a small team that appears to be productive and making good use of resources.

The group has a large number of relevant publications, which represents good outputs from a small group, with lots of variation in projects. There is good focus on future-oriented research. The Department manages well-run demonstration farms focussed on efficient & profitable production. However, research is fragmented and overly-focused on production - there needs to be an enhanced emphasis on sustainability going forward

The Department is involved in some good collaboration with the Food Research Programme.

6.2. Societal relevance

The Department is clearly listening to industry demands / needs. The stakeholder groups are functioning well. The heavy soils programme highlights industry collaboration. However, there needs to be more planned response to industry needs into the future.

The farm systems focus is essential to ensure alignment of goals – profit, social, labour, environment, animal welfare etc. The review team recommends working on a general indicator of sustainability, not only the carbon footprint. The review team also recommends developing more linkages between models and decision tools, which might be a way to develop research on overall sustainability.

Development of decision support tools is essential – the Department needs to work with knowledge transfer departments and farmers in this respect.

Open days, and conferences, seem to be very well delivered and effective – but these need to be built on to ensure practice change and adoption on farm.

The use of dairy calves for beef is an important focus going forward, but does not seem to be adequately addressed in the current research or knowledge transfer activities.

The Department needs to be leading in the environmental and animal welfare space.

6.3. Viability

The future strategy for all areas of the programme was clearly outlined; it is ambitious, given that currently there are only eight researchers in the programme and two of these are on long-term leave.

The recently awarded grant in the area of precision farming will provide some additional resources but will also increase the required infrastructure and other resource needs.

International links should be more developed, in particular in relation to an overall approach of sustainability.

6.4. Recommendations:

Recommendations 1, 2, 3, 5, 8 and 9 are particularly relevant to this Department

6.5. Scores

Quality and productivity	Very good
Relevance to stakeholders	Very good
Viability	Very good

7. Assessment of the Pig Development Department

7.1. Research quality & productivity

This Department is based on an integrated programme spanning knowledge creation through research, and knowledge transfer to industry, via close contacts with producers.

The team has an impressive recent track record, with strong research outputs in high-ranking journals. This includes activities involving postgraduate students, with 18 theses having recently been completed

This group is clearly among the best in their field for applied research as attested by publications, but also the number of projects underway. It is not really involved in any basic research, nor are there collaborations with Animal and Biosciences.

7.2. Societal relevance

The PAP believes this Department is one of the largest and arguably best applied pig research/extension programmes operating globally today. It has strong links to industry/stakeholders that ensures that key issues and priorities are clearly and quickly established.

The Department has established appropriate quantitative targets relative to industry performance levels for key production metrics. Objective targets should also be established and communicated for other important components of the programme such as antibiotic use, environmental impact, and animal welfare.

The projects have arisen from a number of different sources. The levy system for funding some of their research provides a good indication of service / relevance to industry. The relevance of the projects to society /stakeholders is excellent, although there is no work on genetics due to the small scale of Irish pig production relative to the rest of Europe. Feed costs represent a huge problem for the industry – it was not clear to the review team that research in that area was getting enough focus, neither was the area of antibiotic resistance.

The Department benefits from scale effects – although pig production is an important national industry, it is represented by a very small number of farmers relative to the dairy beef and sheep industries.

7.3. Viability

The programme is adequately resourced in terms of funding and people, relative to the number of industry stakeholders. The new pig production facilities have positioned the programme to address key industry issues for some time into the future.

The apparent isolation of the pig Department from other departments, particularly Animal and Biosciences, could limit important collaborations and preclude access to key expertise that does not exist within the group. This isolation should not happen in a small organisation and the PAP attribute this to weaknesses in the structures of the Departments and their overarching programme.

Human resources - the department has two permanent researchers and all of the other researchers are temporary and on short-term contracts. This is a major risk to the future viability of the programme. Furthermore, the number of farm staff is low for the current research load.

7.4. Recommendations:

Recommendations 1, 2, 3, 4, 6, 7 and 9 are particularly relevant to this Department

7.5. Scores

Quality and productivity	Excellent
Relevance to stakeholders	Excellent
Viability	Very good to Excellent

8. Assessment of the Drystock Knowledge Transfer Department

8.1. Research quality & productivity

The department has excellent national visibility and is a very strong and active team with good clear messages and good clear strategy. However, the impact presented was output-focused, i.e. various metrics including numbers attending discussion groups held, etc. It is not clear how real impact is measured. The knowledge transfer activities need a good formal impact assessment that is independent from their interactions and projects. The Department could have some research focus in determining and quantifying impact. The Walsh Fellowships programme could provide the resources for this research, although expertise from outside of AGRIP is likely needed (e.g., in IT and impact assessment).

This department appeared to be well- resourced for current programmes, but identified the need for extra resources for new initiatives. For example, the increase in calves for beef

production coming from the expanding dairy herd has created the need for an additional specialist in the Dairy Calf to Beef knowledge transfer area.

Overall, this group is very dynamic and active, with good leadership. It has excellent visibility, including a strong presence in social media.

8.2. Societal relevance

The programme supports a large number of farms and farmers (94K beef; 36K sheep). Department specialists (11 drystock) deliver the programme to farmers via Teagasc advisors (120 drystock) who work directly with the farmers. A primary role of the specialists is to deliver in-service training programmes to advisors.

The review team had some concerns regarding the financial viability of this industry. The farm financial figures shown in the oral presentations included the single-farm payment and were therefore at times misleading. There needs to be a clear plan of where this industry is going with concerns re Brexit and CAP funding, and the manner in which synergies can be created with dairying.

The review team felt that the Department needed to engage more with advisors and farmers, needed better measures of programme effectiveness, and needed a larger focus on environmental issues. The Department needed to define the targets advisors have in relation to practice change, and the measure of relevant outcomes to quantify this. It needed to engage more with the dairy industry – for example, in relation to contract heifer rearing and the use of dairy calves for beef. There needed to be more clarity on the most profitable systems of beef production and clear adoption plans for programmes outside Grass10.

Links between this knowledge transfer department and the research departments needs to be improved. The PAP believes the structure of the Departments and their overarching programme are not encouraging and facilitating optimal linkage between personnel.

8.3. Viability

The impact assessment that was provided in the oral presentations was in large part based on farm production metrics and yet the AGRIP specialists deliver training programmes to advisors who are managed in a different section of Teagasc. It would be more appropriate for the evaluation of the specialists to be based on the success of the training programmes.

Turnover in advisors has been relatively high in recent years and a significant number have been with the programme for less than five years. If these younger advisors can be retained, this will bring long-term stability to the programme. In the short-term, however, this could limit the effectiveness of knowledge transfer to farmers. Young advisors require upskilling / and other development.

Several of the stakeholders described instances that suggested that the programme wasn't working effectively at the farm level because advisors either weren't available (a particular problem in the spring when the need for advisor input was high) or were not well prepared.

The knowledge transfer area is changing rapidly with increased competition from commercial companies that also offer advisory services to industry, and the increasing importance of new methodologies for information delivery (e.g., social media). Research is needed to evaluate the optimum approaches to interact with commercial knowledge transfer

programmes, to develop new models for knowledge transfer, and to identify the most efficient approaches to deliver information to advisors and, ultimately, farmers. Finally, research is needed to identify and implement the most appropriate methodologies for assessing programme impact. This comment applies similarly to the Dairy knowledge transfer Department.

8.4. Recommendations:

Recommendations 1, 2, 3, 5, 6, 7 and 9 are particularly relevant to this Department

8.5. Scores

Quality and productivity	Excellent (visibility); Very good (impact assessment)
Relevance to stakeholders	Very good
Viability	Very good

9. Assessment of the Dairy Knowledge Transfer Department

9.1. Research quality & productivity

The knowledge transfer group has excellent national visibility. Information on industry outcomes was presented to demonstrate increases in pasture utilisation, and in controlling farm costs. However, the real impact of this Department was hard for the PAP to assess. For example, some of the improvements in industry outcomes may have been attributable to recent expansion of the dairy industry. There did not seem a lot of difference between results for ‘Teagasc vs. non-Teagasc clients’ but this comparison can be complicated by the fact that non-Teagasc clients can benefit indirectly from the knowledge transfer Department’s activities.

9.2. Societal relevance

The programme supports a large number of farms and farmers (18K dairy). Department specialists (7 dairy) deliver the programme to farmers via Teagasc advisors (80 dairy) who work directly with the farmers. A primary role of Department specialists is to deliver in-service training programmes to advisors.

The impact assessment for knowledge transfer was in large part based on farm production metrics and yet the Department specialists deliver training and support programmes to advisors who are managed in a different section of Teagasc. It would be more appropriate for the evaluation of the specialists to be based on the success of technology adoption on farm programmes.

The stakeholder group seems to be very effective – and could have been better used in the review process. Although an animal husbandry focus is required, this Department also has key issues regarding sustainability, grass utilisation, labour, training of staff, environmental issues, food etc. The Department needs to improve its focus on the environment.

There is lack of connection between the knowledge transfer for the dairy industry and the beef industry despite the fact that cull cows from the dairy sector produce a significant part of the beef which is consumed. This did not seem to be appropriately captured by either of the knowledge transfer departments.

The Department has an important role to promote productive and sustainable dairy practices – and this involves community engagement. Joint programmes are key to working with industry.

Some of the stakeholders raised concerns with the PAP that advisors were sometimes unavailable in the key spring period, or were sometimes not well-prepared.

The Department did not convince the PAP that they have appropriate methodologies for assessing programme impact. The Walsh Fellowships Programme could provide the resources for this research, although expertise from outside of the AGRI programme is likely to be needed (e.g., in IT and impact assessment).

9.3. Viability

This knowledge transfer Department appeared to be well-resourced for current programmes, but the management identified the need for extra resources for new initiatives.

The Department did not communicate clear adoption plans for programmes outside Grass10.

The manner in which the Department was formally linked to research departments (and vice versa) was unclear to the PAP. Furthermore, the PAP was not convinced that research farms were being sufficiently exploited by the knowledge transfer Departments for the purposes of knowledge transfer. This may reflect structural issues in relation to the organisation of external linkages between research and knowledge transfer Departments within AGRIP.

9.4. Recommendations:

Recommendations 1, 2, 3, 5, 6, 7 and 9 are particularly relevant to this Department

9.5. Scores

Quality and productivity	Excellent (visibility); Very good (impact assessment)
Relevance to stakeholders	Very good
Viability	Very good

Appendix 1: Profile of Peer Assessment Panel members

Prof. Dorian Garrick is the Chief Scientist at the AL Rae Centre in the Institute of Veterinary, Animal & Biomedical Sciences at Massey University. He held the inaugural appointment to the Jay Lush endowed Chair in Animal Breeding & Genetics at Iowa State University for 10 years from 2007 following 5 years at Colorado State University and 15 years at Massey University where he held the A.L. Rae Chair since 1994. Dorian is a founding partner of US-based Theta Solutions LLC that licenses BOLT software for national and international genetic and genomic evaluations used across a variety of species. He has been integrally involved in the development and implementation of national animal evaluation programmes, performance recording databases and breeding schemes. His recent work has focused on theoretical and applied aspects of using genomic information to predict performance.

Dr. Danny Donaghy is Professor of Dairy Production Systems at Massey University since mid-February 2012. Prior to this, he was Dairy Centre Leader with the Tasmanian Institute of Agriculture, with responsibility for leading and managing Tasmania's dairy research, development and extension. His research is primarily applied in nature, and has concentrated on agronomy and physiology of pasture plants (grasses, legumes and forage crops), with a particular focus on grazing and harvest management and how to manage forages within diverse farming systems and with increasing climatic variability. He has had a strong focus on working with the dairy industry to implement his research on farm.

Dr. Michael Ellis is Professor, Department of Animal Science, University of Illinois. Prior to joining the University of Illinois, Michael worked in the Department of Agriculture at the University of Newcastle upon Tyne, UK. Michael's research interests are swine production science and management; genetic and nutritional influences on growth, and carcass and meat quality characteristics; influence of genetics and environmental factors on feed intake and growth performance; integrated management systems to optimize productivity and pork quality and reduce variation in growing/finishing pigs; sow housing systems and increasing piglet survival.

Dr Jean-Francois Hocquette has been a research scientist at INRA (the French National Institute for Agricultural Research) since 1991 and is today "Research director class 1" within INRA. He also works for the French High Council for Evaluation of Research and Higher Education (HCERES). His research interests are muscle biology as well as functional genomics pertaining to muscle growth and beef eating quality. In 2014 and 2016, Jean-Francois organised the French Meat R&D congress. He is involved in the activities of the EAAP (European Federation of Animal Science) and is the editor of two EAAP books, three scientific Journals and editor-in-chief of the French Meat R&D Journal. Jean-Francois became a member of the French Meat Academy in 2010 and received the 2014 Animal Growth and Development Award from ASAS.

John Kehoe is a beef and tillage farmer from Co. Carlow. He returned to the home farm after completing his BAgrSc Agricultural Science in UCD in 2004. John is currently chairman of the Teagasc Beef Stakeholders group where through vision, research and efficiency a more profitable and sustainable Irish beef industry will follow. He believes strongly that farmers need to shape agricultural policies in Europe to suit the agricultural industry of tomorrow.

Dr. Sean McCarthy is Services Manager with Kerry Group. He manages a range of services to Kerry's 3,200 milk suppliers to enhance the sustainability of their farm businesses and secure a supply of premium quality milk for manufacturing. Sean's research interests relate to grass-based farm systems having completed a PhD in this area. He has worked in the

areas of Research, Development and Extension in Ireland and New Zealand and has a keen interest in ensuring research delivers practical solutions for farmers. Sean believes that peer reviewed, robust, independent research is fundamental to ensuring farm systems are resilient and sustainable into the future.

Dr Lance O'Brien is Head of Strategy and International Relations at Teagasc. He is a member of the Teagasc Senior Management Team and works on the development of Teagasc organisational policies and strategies, its relationships with international organisations, as well as leading its international agricultural development programme. Lance has a particular expertise in foresight. He led the two recent Teagasc major Foresight projects, namely Teagasc 2030 (2008) and Teagasc Technology Foresight 2035 (2016). He was also a member of the Third EU SCAR Foresight Expert Group. Lance also contributed to the two recent industry-led strategies—Food Harvest 2020 (2010) and Food Wise 2025 (2015).

Dr. Kevin Heanue, Teagasc's Evaluation Officer, leads the development of an evaluation culture in Teagasc through the cyclical evaluation of its research programmes, extension activities and once-off evaluations of organisational activities and functions. He provides a secretariat to the AGRI Programme Peer Assessment panel.

Appendix 2: Schedule for site visit

The following is the proposed schedule of activities for the duration of the AGRIP Peer Assessment from 01-03 November 2017. This schedule allows for the following, approximately:

- 25 minute presentation by each Head of Department
- 20 minutes for questions and answers between the Peer Assessment Panel and Department Staff
- 30 minutes for the panel to deliberate after each presentation, Q&A

Wednesday, 1 November 2017

Time	Action	Key Topics
19:30	Welcome and briefing on requirements of the Peer Assessment by Prof. Gerry Boyle, Director of Teagasc or Dr. Frank O'Mara, Director of Research	Welcome and briefing on requirements, Teagasc strategy, goals and organization structure.
20:00	Dinner (Grand Hotel, Fermoy)	Attended by Director, Frank O'Mara, Pat Dillon and HOD's.

Thursday, 2nd November 2017

Time	Action	Key Topics
08:15	Transportation from accommodation to Teagasc Animal & Grassland Research Innovation Centre	
08.30	Introduction and approach to Peer Assessment Kevin Heanue, Evaluation Officer	Explanation of approach to peer review, process for the two days, organization chart for the AGRI Programme, who will present and who will not present, structure and format of end report.
09:00	Presentation by Programme Management Dr. Pat Dillon, Head of AGRIP (20 mins)	Overview of programme, research strategy, structure, funding, policy, publications and support mechanisms, technology transfer and strategy. Q&A
09:45	Panel Deliberations	Report, Programme quality, productivity, relevance and viability.
10.15	Tea/Coffee	
10:30	Animal Bioscience Department Prof. Michael Diskin, (20 mins)	Overview, objectives, strategy, structure, future, examples of 2-4 projects, outputs and impacts. Q&A
11:15	Panel Deliberations	Department research quality, productivity, relevance and viability
11:45	Grassland Science Department Dr. Michael O'Donovan, (20 mins)	Overview, objectives, strategy, structure, future, examples of 2-4 projects, outputs and impacts. Q&A
12:30	Panel Deliberations	Department research quality, productivity, relevance, and viability.
13.00	Lunch	
14:00	Livestock Systems Dr. Pdraig French, (20 mins)	Overview, objectives, mission, strategy, structure, future, examples of 2-4 projects, outputs and impacts. Q&A
14.45	Panel Deliberations	
15.15	Pig Development Department Mr. Ciaran Caroll, (20 mins)	Overview, objectives, mission, strategy, structure, future, examples of 2-4 projects, outputs and impacts. Q&A
16:00	Panel Deliberations	Department quality & productivity, relevance and viability. Panel begins to draft report
17:00 – 17.30	Optional meeting with staff	
19:30	Dinner in The Forge, Fermoy	Panel only

Friday, 3rd November 2017

Time	Action	Key Topics
07.45	Transportation from hotel to Teagasc Animal & Grassland Research Innovation Centre	
08:00	Options: Visit to Piggery or visit to Dairy Unit	Walsh Fellows/Post Docs/CRO's available if possible.
09:00	Drystock Knowledge Transfer Department Mr. Pearse Kelly, (20 mins)	Overview, objectives, mission, strategy, structure, future, examples of 2-4 projects, outputs and impacts. Q&A.
09.45	Panel Deliberations	Department quality & productivity, relevance and viability
10.15	Dairy Knowledge Transfer Department Dr. Tom O'Dwyer (20 mins)	Overview, objectives, mission, strategy, structure, future, examples of 2-4 projects, outputs and impacts. Q&A
11.00	Panel Deliberations	Department quality & productivity, relevance and viability
11:30	Tea/Coffee available	
12.00	Meeting with stakeholder representatives (selection of members from stakeholder groups)	Current experiences with Teagasc Views on future needs and capacity of Teagasc to meet these needs
13:00	Lunch	
13:45	Panel draft report, and prepare exit presentation for AGRIP Management	
16:00	Panel meets with Prof. Gerry Boyle, Dr. Frank O'Mara, Director of Research, Dr. Pat Dillon, and Heads of Department	Panel present findings and recommendations from review
17:00	Finish	

Appendix 3: Criteria and scores from Revised Standard Evaluation Protocol

Assessment criteria

The PAP assesses the research and KT programme and sub-programmes on the basis of the three criteria outlined below, i.e. quality & productivity, relevance to society and viability, using qualitative assessment (text) and quantitative assessment (four assigned categories) (see Table 1).

1. Research & KT quality and productivity

The panel assesses the quality of the unit's research and the contribution that the research makes to the body of scientific knowledge. The panel also assesses the scale and productivity of the unit's research results (scientific publications, instruments and infrastructure developed, and other contributions to science).

The panel assesses the quality of the KT unit's activities and methods and the contribution those activities and methods make to the transfer of scientific knowledge. The panel also assesses the scale and productivity of the unit's activities (events, publications, stakeholder involvement, training, education provision and other contributions to knowledge transfer).

2. Research & KT relevance to society/stakeholders

The panel assesses the quality, scale and relevance of research and KT contributions targeting specific farming economic, social or cultural target groups and/or stakeholders, of advisory reports for policy, of contributions to public debates, and so on. The point is to assess contributions in areas that the unit has itself designated as target areas.

3. Research & KT viability

The panel assesses the strategy that the research and KT units intend to pursue in the years ahead and the extent to which they are capable of meeting their targets in research or knowledge transfer during this period. It also considers the governance and leadership skills of the units' management.

Walsh Postgraduate Fellowships Programme, research integrity and diversity

Each programme assessment will also include assessment of three further aspects: the Walsh Postgraduate Fellowships Programme; research integrity; and diversity.

1. The Walsh Postgraduate Fellowships Programme (WFP)

The assessment committee considers the supervision and instruction of PhD candidates. The relevant subjects include the institutional context of the PhD programmes, the selection procedures, the programme content and structure, supervision and the effectiveness of the programme plans and supervision plans, quality assurance, guidance of PhD candidates to the job market, duration, success rate, exit numbers, and career prospects. The research unit undergoing assessment responds to a number of questions in the self-assessment, described in the format provided in Appendix 4. The unit should use these questions to reflect on its own PhD programmes and on how it supervises PhD candidates. The assessment committee discusses this during the site visit, comments on this in its report, and, where appropriate, makes recommendations for improvement.

2. Research integrity

The assessment committee considers the research unit's policy on research integrity and the way in which violations of such integrity are prevented. It is interested in how the unit deals with research data, data management and integrity, and in the extent to which an independent and critical pursuit of science is made possible within the unit.

The assessment committee bases its assessment on how the research unit itself describes its internal research culture. The research unit undergoing assessment responds to a number of questions in the self-assessment, described in the format provided in Appendix 4. The unit should use these questions to reflect on its own data management practices, the level of internal research integrity, and the transparency of its research culture. The assessment committee discusses these points during the site visit, comments on this in its report, and, where appropriate, makes recommendations for improvement.

3. Diversity

The assessment committee considers the diversity of the research unit. Diversity can act as a powerful incentive for creativity and talent development in a research unit. Diversity is not an end in itself in that regard but a tool for bringing together different perspectives and opinions. The assessment committee bases its assessment on how the research unit itself describes its internal diversity. This refers to such topics as gender, age, and ethnic background. The research unit undergoing assessment responds to a number of questions in the self-assessment, described in the format provided in Appendix 4. The intention is for the research unit to use the answers to reflect on its own diversity. The assessment committee discusses these points during the site visit, comments on this in its report and, where appropriate, makes recommendations for improvement.

Appendix 4: Action Plan for Implementation of Recommendations

**Peer Review of the Animal and Grassland Research
and Innovation Programme (AGRIP) Programme 2017**

Action Plan for Implementation of Recommendations

Date: 26 May 2018

Submit to: Dr. Frank O'Mara, Director of Research

This action plan outlines the recommendations from the peer assessment report on the Animal and Grassland Research and Innovation Programme (AGRIP) 2017. To complete this action plan please specify the actions to be taken, if any, to implement the recommendations outlined, allocate responsibility for these actions and set a target date by which the recommendation is to be implemented.

1. Recommendations for AGRIP

No.	Recommendations	Focus	Actions to be taken	Person	Date
1	Review the management structure and communication systems to enhance collaboration across departmental units and better facilitate two-way exchanges between researchers, knowledge transfers and their stakeholders and clients.	Overall programme and all individual Departments	1. Teagasc senior management will review the AGRI structures with the objective of improving collaboration and communication.	All HOD & HOP	June 2019
			2. Collaboration between departments will be fostered through; <ul style="list-style-type: none"> ➤ Two 1-day AGRI review meetings will be held annually- these will be enterprise based (dairy, beef, sheep and pigs) and to include both research and KT staff. ➤ Research project review meeting will be held annually to review all RMIS projects; all research and KT staff will be invited to attend. ➤ Minutes of stakeholder meetings will be circulated to all staff. 	All HOD & HOP	April 2019
				All HOD & HOP	June 2019
				All HOD & HOP	Sept. 2018
2	Review the systems and processes used to identify industry problems, and manage the required research and knowledge transfer endeavors, to ensure that new and existing knowledge is efficiently transferred and applied.	Overall Programme and all individual Departments.	1. Review and implement terms of reference of stakeholder groups; requirement for more diversity in group membership	All HOD & HOP	Jan 2019
			2. Hold one annual joint dairy and beef stakeholder meeting.	Tom O'Dwyer, Pearse Kelly, Pat Dillon.	Jan 2019
			3. Hold one annual AGRIP meeting to prioritise new research areas.	All HOD & HOP	June 2019
			4. Facilitate the implementation of the recommendations of the recent review of In-	Tom O'Dwyer,	Jan 2019

			Service Training delivery. 5. Prioritise resources towards enhanced KT and communication activities, including the development of an enhanced ability to self-publish	Pearse Kelly, Pat Dillon. Tom O'Dwyer, Pearse Kelly, Pat Dillon.	Jan 2020
3	Investment in research, education and knowledge transfer activities must be justifiably balanced across species, and production systems, taking account of current and anticipated industry needs and consumer/societal concerns related to production quality and quantity, welfare, environment.	Overall Programme and all individual Departments.	1. Review the prioritisation in investment/resources in the different sectors in the AGRI programme based on: a. Economic importance b. Future anticipated needs c. Consumer/societal concerns 2. Future animal production studies will put greater emphasis into aspects such as animal welfare, environmental and social aspects. Currently a new research strategy is being developed; this will facilitate this.	All HOD & HOP Pat Dillon, Michael Diskin, Michael O'Donovan, Padraig French, Edgar Garcia Manzanilla	Jan 2020 Jan 2019
4	Strengthen the human resource component of the AGRI programme.	Overall Programme.	1. An analysis of the need for technical, farm and administration staff will be carried out at each location to identify these requirements. 2. Hire research staff in new disciplines such as Big Data and statistics, including precision agriculture. 3. Provide development opportunities to existing staff; including sabbaticals, study exchange etc.	Pat Dillon, Michael Diskin, Michael O'Donovan, Padraig French, Edgar Garcia Manzanilla. Pat Dillon, Michael Diskin, Michael O'Donovan, Padraig French, Edgar Garcia Manzanilla All HOD & HOP	June 2019 Jan 2020 June 2019
5	Improve IT infrastructure and	Overall Programme			

	communication technologies to meet the current and future needs for research, education KT and administration.	and particularly the following Depts. 1. Grassland Science 2. Livestock Systems 3. Drystock Knowledge Transfer 4. Dairy Knowledge Transfer	1. Establish a working group with ICT Dept. to improve the IT infrastructure and communication technologies. 2. Prioritise ICT related projects for development for future needs for research, education, KT and administration. (similar to PBI over the last 3 years)	All HOD & HOP All HOD & HOP	Jan 2019 Jan 2019
6	Apply, and where necessary develop, common tools, methods and indicators to assess the impact of knowledge transfer programmes across the full range of production, welfare, social and environmental parameters in beef, dairy, sheep and pig programmes.	Overall Programme and particularly the following Depts. 1. Pig Development 2. Drystock Knowledge Transfer 3. Dairy Knowledge Transfer	The published literature recognises the challenges posed in the evaluation of the impact of KT programmes and activities. Specifically, two problems are raised: (1) what is the definition of effectiveness ('what to measure'); and (2) what is the appropriate evaluation method ('how to measure'). Notwithstanding these challenges, the literature also highlights a number of completed evaluations, using different methodologies. Teagasc has a full-time Evaluation Officer and in future, AGRIP will engage with that person to ensure that evaluation is built into a number of AGRIP KT activities from the beginning of KT programmes/ projects/ activities. In response to this recommendation, Teagasc proposes to: 1. Review available frameworks and methodologies to assess the impact of KT programmes and select the most suitable one(s) for use to measure the impact of Teagasc KT programmes. 2. Plan and budget for monitoring and evaluation as part of KT programmes. 3. On an annual basis, to review the impact of four KT programmes/ projects/ activities (one per livestock sector – dairy, beef, sheep and pigs) using the selected methodology.	Tom O'Dwyer, Pearse Kelly, Edgar Garcia Manzanilla Pat Dillon Tom O'Dwyer, Pearse Kelly, Edgar Garcia Manzanilla Pat Dillon	Jan 2020 Jan 2020

			4. Share the findings of these reviews with participants and stakeholders.	Tom O'Dwyer, Pearse Kelly, Edgar Garcia Manzanilla Pat Dillon	Jan 2020
				Tom O'Dwyer, Pearse Kelly, Edgar Garcia Manzanilla Pat Dillon	Jan 2020
7	Ensure the AGRI programme maximizes the benefits that can be obtained from the Walsh Fellowships Programme across the range of research and knowledge transfer activities, including in the assessment of impacts of knowledge transfer.	Overall Programme and particularly the following Depts. 1. Pig Development 2. Drystock Knowledge Transfer 3. Dairy Knowledge Transfer	1. Greater link up / collaboration with KT Walsh Fellows, specifically including the identification of appropriate projects and provision of research support.	Tom O'Dwyer, Pearse Kelly, Edgar Garcia Manzanilla Pat Dillon	Jun 2019
8	Strengthen, or where appropriate establish, national and international collaborations to leverage research, education and knowledge transfer expertise.	Overall Programme and particularly the following Depts. 1. Animal Bioscience 2. Grassland Science 3. Livestock Systems	1. Review current Teagasc strategic alliances and MOU. 2. More discussion required at management level on potential collaboration to strengthen current programme; new research strategy will facilitate this. 3. Link back to HR actions i.e. exchanges, sabbaticals etc.	Pat Dillon, Michael Diskin, Michael O'Donovan, Padraig French, Pat Dillon, Michael Diskin, Michael O'Donovan, Padraig French, All HOD & HOP	Jun 2019 Jun 2019 Jun 2019
9	Define the structure and resources required, and the roles and responsibilities of the research and knowledge transfer teams in relation to undergraduate education.	Overall Programme and all individual Departments.	1. Positive development but its unstructured currently; needs to be recognised as part of role profile of staff. 2. Need to limit individual's time to this role i.e. Max 20% of any one individual's time. 3. Needs to be fully budgeted with payments coming back to the individual Department as extra staff to support the programme	All HOD & HOP All HOD & HOP All HOD & HOP	Jan 2020 Jan 2020 Jan 2020