REVIEW OF
THE INSTITUTE OF FOOD RESEARCH
– SCIENCE AND FUTURE GOVERNANCE

REPORT FOR BBSRC COUNCIL

APRIL 2007

REVIEW OF IFR SCIENCE AND FUTURE GOVERNANCE

TABLE OF CONTENTS

FOREWORD

BACKGROUND AND CONTEXT TO THE REVIEW

Introduction

F1. The Institute of Food Research (IFR) in Norwich is one of seven research institutes core-funded by the Biotechnology and Biological Sciences Research Council (BBSRC[1]). This review of IFR was set up to advise Council on progress that IFR had made in implementing its science strategy, on whether there had been improvements in science quality since the last full assessment of the institute in 2005, and on options for future delivery of BBSRC's priorities in the area of Diet and Health.

F2. IFR was last reviewed in 2005 by a Visiting Group of independent experts as part of the Institute Assessment Exercise (IAE), which assessed all the BBSRC-sponsored institutes and which informed the Council's allocation of core funding for the four years from April 2006 to March 2010. The IAE revealed some concerns about the quality of science at IFR. Whilst recognising some excellent programmes and individual projects, four of the seven programmes at IFR were deemed overall to be below 'international quality' science[2].

F3. At the time of the 2005 IAE, the Director of IFR, Professor David White, was only part way through implementing a new 5-year science strategy for the institute[3]. The Visiting Group in 2005 was strongly supportive of the new plan. Council agreed that under the circumstances it would review IFR again, beginning in 2007, to assess the impact of the science strategy once it had become more established and to assess any concomitant increase in science quality.

Institute governance

F4. In a separate development, during 2006 BBSRC established an independent review of the governance of its seven sponsored institutes (the Follett review[4]). The review concluded that the current arrangements for institute governance should be modernised. It set out four basic governance models but did not make specific recommendations for each institute, recognising that different solutions may be appropriate for different institutes.

F5. In light of the Follett report, the seven BBSRC-sponsored institutes and their governing bodies have given their views to Council on how they would wish to revise their governance arrangements. Council has agreed to consider each institute separately to maximise its opportunities depending on the local circumstance. For example there are clear plans for Roslin and the Neuropathogenesis Unit of the Institute for Animal Health (IAH) to move away from BBSRC and transfer to the University of Edinburgh to create a new international centre for animal bioscience research (EBRC). Other changes will result in Rothamsted Research coming under

---

[1] For background information on BBSRC and its sponsored institutes, see **Annex 1**.

[2] *Report of the Visiting Group to the Institute of Food Research* (BBSRC, 2006) available from http://www.bbsrc.ac.uk/about/pub/reports/06_feb_visitinggroups.html

[3] *Strategic Plan 2005 – 2010* (IFR, 2005) available from http://www.ifr.bbsrc.ac.uk/publications/default.html#strategicplan

[4] *Report of an independent review of governance of BBSRC-sponsored Institutes* (BBSRC, 2006) available from http://www.bbsrc.ac.uk/media/pressreleases/06_10_24_welcome_follett.html

the direct control of BBSRC from April 2008 and IAH will follow in 2009. Council will continue to consider the proposed options for the other institutes during 2007.

Terms of reference

F6. In the context of this background – the previous review of IFR, its strategic plan and prospective changes in the governance of the BBSRC-sponsored institutes – Council established an expert review panel to advise on the current status and future of IFR. At its meeting in December 2006, Council agreed the following terms of reference for the review.

Terms of reference

Against the background of the 2005 IAE report on IFR, the Institute's science strategy, BBSRC's food science needs and the Follett review on institute governance:

i. Review progress on the implementation of IFR's science strategy, setting out current structures and concomitant improvements in science quality.

ii. Consider in broad terms how BBSRC's priorities with respect to IFR science should be delivered within a framework of financial sustainability and in the light of generic governance models recommended by the Follett group.

iii. Report to Council in April 2007.

F7. The review panel was chaired by Professor Quintin McKellar (member of Council); the panel membership is given at **Annex 2**. The review panel met three times, including a two-day visit to IFR during which institute staff presented their work in each programme or other activity (highlighting progress since the 2005 Visiting Group) and outlined their future plans for the research and its exploitation.

EXECUTIVE SUMMARY

Within the context of ensuring that the UK is internationally competitive in Diet and Health research, BBSRC established this review to advise on the science and future governance of the Institute of Food Research (IFR).

Science quality and culture
Since the last full assessment of IFR in 2005, there is evidence of an improvement in the overall quality of science at the institute. Five of the seven science programmes are now broadly of international standard (three were 'international' in 2005). The remaining two programmes are judged not to be internationally competitive at present, but it is anticipated that the recommendations in this review, when taken together, will address this.

There has been a detectable positive shift in culture at IFR since 2005. Restructuring the institute to align it with its Strategic Plan has entailed a number of redundancies so it has been a difficult period, but the Director and staff should be congratulated on the more outward-looking ethos that is emerging. Nonetheless, if Council is to get better value for money from IFR, then further effort is needed to reinforce the improvements, to promote integration across the programmes and to strengthen external collaborations.

Internal 'Partnerships' and Exploitation Platforms
In addition to the seven science programmes, IFR organises its activities between six internal 'Partnerships' and six Exploitation Platforms. The Partnerships are intended to deliver cross-institute scientific support (such as imaging, proteomics) for the science programmes. While some of the Partnerships fulfil a useful function, greater clarity is needed in their roles, and scientific support functions should be shared wherever possible across the Norwich Research Park.

The six Exploitation Platforms (EPs) cover activities that the institute considers offer potential for commercial development. The principle of EPs is a good one, but a number do not appear to have realistic prospects for commercial success. IFR should reconsider the organisation of the EPs and redefine the expectations of commercial development.

Governance (future delivery of Diet and Health research and training)
The continuing need for an institute
Given the strategic importance of the Diet and Health area, the case is strong for keeping a mission-focussed, multidisciplinary institute or centre. Institutes are able to support their science with high quality specialised facilities (unique, in some cases) and can sustain integrated research programmes over longer timescales than typically seen in the universities. It would be more difficult for BBSRC to deliver its High Level Food Research Strategy without the coordinated and focused effort in a food related research institute or centre.

Recommendation 1: There is a need for a food science research institute in the UK to undertake mission-driven high quality research focussed in the Diet and Health area. The core expertise and capability currently within IFR provides a critical mass of researchers, and is a base upon which Council could build.

Embedding IFR in a university
In seeking to develop the existing critical mass and expertise within IFR then closer integration with one or more universities offers the best prospects for achieving a sustainable and strengthened body of high quality research focussed on Diet and Health.

Recommendation 2: There is considerable merit in embedding the core expertise at IFR in the university sector and BBSRC should explore opportunities for a new Diet and Health partnership with leading institutions. Embedding the institute should be done so as to further develop the coherence of the strategically important research areas at IFR rather than fragmenting them across a variety of host institutions.

The transfer of IFR to a university (Follett option 1) would be desirable provided a university partner with sufficient relevant research strength and commitment can be identified. Otherwise, IFR should move to direct BBSRC control within a university setting (Follett option

3, embedded). In establishing a new partnership with a university, close integration of significant numbers of researchers from each partner, based around shared facilities, will be crucial.

Recommendation 3: In seeking a university partner for IFR, if the scale and vision of the partnership is such that Council has confidence in the long-term security of Diet and Health capability, then Follett option 1 would be attractive. Otherwise option 3 (embedded) is preferred in the first instance, with the possibility of moving to full integration and transfer to the university later.

Recommendation 4: When embedding IFR, BBSRC should be seeking to achieve the co-location of staff from each partner (with key joint appointments), sharing laboratory space and other facilities, such that a larger body of high quality research and training can be established. It will be essential that the IFR/university partnership comprises sufficient numbers to signify a genuine substantive collaboration.

New appointments

Looking to the future of a new IFR/university partnership, there is a need for 'new blood' to reinvigorate some key research areas, to improve succession planning and to develop potential programme leaders for the future. Increasing the number of research fellows within the new structure will also be an important component of building an enhanced core of expertise.

Recommendation 5: Existing recruitment plans at IFR need to be accelerated, in particular at programme leader level in immunology and nutrition. A clear succession plan must be developed for programme leaders and other key staff.

Recommendation 6: The Director and programme leaders should develop a clear strategy for boosting the number of fellows at the institute. Council should consider creating a small number of institute fellowships awarded on a competitive basis to the new IFR/university partnership.

Future funding models

IFR's current CSG funding should be re-cast into peer reviewed and fully costed strategic programme grants, ideally to be developed as part of the proposed new IFR/university partnership. This will be crucial to further enhance the science quality and focus and to improve the overall transparency of funding. The seven IFR science programmes could logically be presented as four strategic programmes, which would be fully integrated and include the costs of scientific support services and facilities currently provided through the internal Partnerships.

Recommendation 7: BBSRC's funding for IFR within a new university setting should be in the form of a small number of independently peer reviewed strategic programme grants. The precise nature of these will depend on the strategic plans of the IFR/university partnership but the expectation is they will be multidisciplinary and fully integrated.

Change management

Further changes and reorganisation of IFR will occur as a new university partnership develops. It will be essential that the senior management at the institute have external advice and coaching in the effective management of change. This will assist greatly the institute in moving forward.

Recommendation 8: Working with BBSRC, IFR should seek additional and professional support for change management in order to facilitate any future transition in structure and funding of the institute.

REVIEW OF IFR SCIENCE AND FUTURE GOVERNANCE: REPORT FROM THE REVIEW PANEL

1. In compiling this report and its recommendations to Council we took into account the institute's written submission for the review, the presentations and discussions with IFR staff during the panel's two-day visit to the institute and a quantity of other background information (listed in **Annex 3**).

2. Our intention was not to scrutinise the institute's work in as great detail as did the Visiting Group (VG) in 2005; rather, to take the VG's report as our baseline and to concentrate on establishing the level of progress since that previous assessment.

3. In accordance with the terms of reference, we focussed on the institute's science, associated activities and management, and, given the strategic importance of Diet and Health research, considered how the science could be best delivered in the future in terms of possible governance models for the institute.

IFR SCIENCE - CURRENT STRUCTURES AND QUALITY ASSESSMENT

4. Following the introduction of the institute's Strategic Plan in 2005, the research and associated work at IFR has been organised primarily in three types of activity:

- **Programmes** of basic and strategic research (seven Programmes at the time of this review)
- **Partnerships** – groupings within IFR intended to provide facilities and expertise (e.g. bioinformatics and statistics, imaging) across the institute in support of the science programmes (six internal Partnerships at the time of this review)
- **Exploitation Platforms** – areas that the institute considers offer good potential for commercial development (six Exploitation Platforms at the time of this review).

5. We examined IFR's work in each of the three types of activity, and our conclusions are summarised in the sections below.

Detailed comments and recommendations on each of the programmes and other activities are confidential advice to Council and are recorded separately from the main body of the report.

Summary Assessment – Science Programmes

6. The institute presents its seven science programmes (in line with its Strategic Plan) as being centred around the common (long-term) goal of understanding the gut as an integrated biological system. It is obvious that some of the programmes (such as G1 Gastrointestinal Biology and Health) are more wholly aligned with this goal than are others (such as S2 Pathogens, Physiology and Predictive Ecology). The VG in 2005 endorsed the Strategic Plan, and we share that view, but would comment that as the strategy moves forward it may be appropriate to place less emphasis on microbiology and more on research relevant to the major diet-related public health issues. Nevertheless, IFR's science, when taken together, is highly relevant to BBSRC's priorities as set out in the recent High Level Food Research Strategy (BBSRC, 2007)[5].

[5] http://www.bbsrc.ac.uk/about/pub/reports/07_feb_foodresearchstrategy.pdf

7. For summary funding information on the seven science programmes, see Table 1.

Table 1: Summary information for IFR science programmes
Estimated figures for 2006/07 (*actual figures for 2005/06 in brackets*)

Programme		PIs	CSG (£k)	Competitive funding BBSRC (£k)	External funding (£k)
F1	Structuring Food for Health	4 *(6)*	1349 *(991)*	267 *(156)*	523 *(777)*
G1	Gastrointestinal Biology and Health	3 *(3)*	704 *(831)*	0 *(0)*	342 *(347)*
G2	Gut Microflora	4 *(5)*	837 *(830)*	105 *(165)*	136 *(257)*
H1	Phytochemicals and Health	4 *(4)*	1321 *(1178)*	326 *(319)*	485 *(509)*
H2	Micronutrients	1 *(6)*	713 *(837)*	60 *(65)*	378 *(428)*
S1	Pathogens: Molecular Microbiology	1 *(3)*	958 *(943)*	59 *(0)*	63 *(101)*
S2	Pathogens: Physiology and Predictive Ecology	4 *(5)*	938 *(770)*	0 *(19)*	274 *(601)*
	Total:	**21 *(32)***	**6821 *(6380)***	**818 *(724)***	**2200 *(3020)***

8. Given the snapshot of research available to us on the short site visit, the overall quality of the science at IFR has shown some improvement (summarised in Box 1) since the 2005 Visiting Group.

Box 1. Summary of changes in science quality at IFR since 2005 Visiting Group (to be read in conjunction with paragraphs 9-11).

		2005 VG Assessment	Current Assessment
F1	Structuring Food for Health	International	International
G1	Gastrointestinal Biology and Health	High National	High National
G2	Gut Microflora	International	International
H1	Phytochemicals and Health	High National	International
H2	Micronutrients	International	High National / National
S1	Pathogens: Molecular Microbiology	High National	International
S2	Pathogens: Physiology and Predictive Ecology	High National	International

9. Programmes H1, S1 and S2 were all rated 'High National' in 2005, and have improved to a level where we were comfortable to regard the quality as being overall

of 'International' standard, with better publication records, new external funding and strengthened collaborations both within IFR and externally. Some of this improvement was certainly due to increased focus on the previously existing international quality elements within these programmes. Programmes F1 and G2, which were rated by the 2005 VG as 'International', had maintained that standard and continue to make progress.

10. We had concerns over two of the seven Programmes. Programme G1, which was rated as 'High National' standard by the 2005 VG, remains, in our view, mostly High National with a mixture of international and national quality research. Clearly effort is being made to address the VG's recommendations but overall impact has been modest.

11. Programme H2 has suffered in recent months from the departure of the programme leader. It was an 'International' standard programme in 2005 but it is less than that now. It lacks leadership and clear direction and its future will be critically dependent on a suitable new senior appointment.

12. Overall it is apparent that there has been a shift in culture at IFR since 2005. Restructuring the institute to align it with the new Strategic Plan has entailed the loss of a number of staff posts so it has undoubtedly been a difficult period, but the Director and staff should be congratulated on the positive attitude and, in some respects, more outward-looking culture that is emerging. Nonetheless, if Council is to get better value for money from its investment in IFR, there remains a need for further efforts to reinforce the improving culture, to promote integration and cohesion across the programmes and also to strengthen external collaborations.

Summary Assessment – Partnerships

13. The six (internal) Partnerships cover various cross-institute activities in support of the research programmes. They are:

- Bioinformatics and statistics
- Metabolomics
- Proteomics
- Imaging
- Human Nutrition Unit
- Consumer Sciences

14. For summary funding information see Table 2.

15. We shared the concerns raised by the 2005 VG over the rationale for the way these activities were organised and their effectiveness. While at least some of the internal Partnerships are fulfilling a useful function, there is a need for greater clarity (not least for the benefit of the staff) in defining their roles, in particular whether they are expected to undertake their own research in addition to supporting the science programmes. We are supportive of some research where appropriate within the Partnerships, in order to keep abreast of developments in the field.

16. The structure, function and funding arrangements of the internal Partnerships should be reconsidered. Scientific support services such as these should be funded transparently on a FEC basis from the relevant research programmes' budgets based on the costs of using the services. At the same time, opportunities should be

explored for further joint working or shared scientific services across the Norwich Research Park wherever appropriate.

Table 2: Summary information for IFR internal Partnerships and Exploitation Platforms

Estimated figures for 2006/07 (*actual figures for 2005/06 in brackets*)

Partnership		PIs	CSG (£k)	Competitive funding BBSRC (£k)	External funding (£k)
BS	Bioinformatics and Statistics	1 *(1)*	236 *(270)*	89 *(66)*	90 *(90)*
MET	Metabolomics	1 *(1)*	307 *(406)*	74 *(20)*	0 *(68)*
PRO	Proteomics	1 *(1)*	146 *(137)*	0 *(0)*	0 *(0)*
IMG	Imaging	1 *(3)*	428 *(332)*	96 *(48)*	71 *(43)*
HNU	Human Nutrition Unit	1 *(1)*	205 *(11)*	0 *(0)*	8 *(27)*
CS	Consumer Sciences	1 *(1)*	301 *(159)*	0 *(0)*	52 *(65)*
	Total:	**6** ***(8)***	**1623** ***(1315)***	**258** ***(134)***	**221** ***(292)***

Exploitation Platform		PIs	CSG (£k)	Competitive funding BBSRC (£k)	External funding (£k)
MG	The Model Gut	2 *(2)*	122 *(122)*	28 *(28)*	36 *(23)*
MRI	Magnetic Resonance Imaging	1 *(1)*	199 *(198)*	32 *(65)*	123 *(124)*
SFC	Sustainability of the Food Chain	1 *(1)*	379 *(419)*	0 *(0)*	93 *(353)*
ME	Microbial Ecology	1 *(1)*	226 *(183)*	0 *(0)*	0 *(44)*
NCYC	National Collection of Yeast Cultures	1 *(1)*	216 *(402)*	54 *(50)*	128 *(0)*
FD	Food Databanks	1 *(1)*	260 *(344)*	4 *(9)*	686 *(679)*
	Total:	**7** ***(7)***	**1401** ***(1668)***	**119** ***(151)***	**1067** ***(1222)***

	Grand Total for Tables 1 and 2	**34** ***(47)***	**9845** ***(9363)***	**1195** ***(1009)***	**3488** ***(4534)***

Summary Assessment – Exploitation Platforms

17. The six Exploitation Platforms are engaged in activities that the institute considers offer good potential for commercial development. Currently these are:

Technology Platforms

- Model Gut
- On-line MRI

Applied Science Platforms

- Sustainability of the Food Chain
- Microbial Ecology

National Resource Platforms

- National Collection of Yeast Cultures
- Food Databanks

18. For summary funding information see Table 2.

19. Like the VG in 2005, we were supportive of the principle of IFR's Exploitation Platforms, which represent an imaginative development in knowledge transfer. However, we had concerns that following the 2005 VG some weaker parts of the science programmes were converted into Exploitation Platforms. This is not a rational basis for establishing such activities.

20. The platforms encompass a variety of very different activities, and some of these may offer realistic potential for commercial development. The commercial case is less persuasive for others but nevertheless they are concerned with worthwhile aspects of knowledge transfer such as maintenance of the national yeast culture collection and provision of data on food composition to the research community and policy makers.

21. Based on the evidence presented, we are not convinced that the institute is receiving effective outside advice on commercial exploitation, nor exploring adequately the potential for venture capital funding. The arrangement of activities in the Exploitation Platforms should be reconsidered. Those with realistic prospects of commercialisation should have clearly defined timescales in which to be commercially self-sustaining or be wound up. Others that are not destined for commercialisation should be redefined and the expectations clarified.

GOVERNANCE AND RECOMMENDATIONS

22. Given the relevance of IFR's research to BBSRC (and nationally) and indications that science quality is improving, we considered how best to deliver the science in the future. Below are a number of specific recommendations concerning governance and other actions that will help to secure research capability in Diet and Health whilst at the same time further increasing the international quality and focus of the Council's investment in this area.

The need for an institute

23. We concurred with the 2005 VG that there remains a need for a UK food science research institute. The strategic case is strong for keeping a coherent and well-integrated organisation undertaking coordinated programmes of research in the Diet

and Health area. It is also important to maintain the provision of high quality scientific advice to industry, the public and policy makers.

24. Institutes are able to support their research programmes with high quality specialised facilities (unique, in some cases) and infrastructure, and can sustain integrated research programmes over longer timescales than is typically seen in the university sector. It would be more difficult for BBSRC's recently formulated High Level Food Research Strategy to be delivered effectively by the university sector alone, without the additional coordinated and focused effort in a food science research institute or centre.

25. Given that there is benefit in an institute model for Diet and Health then Council could, of course, withdraw its funding from IFR and invest in an entirely new institute or centre. But there are reasons why it would be better to build upon the existing core of IFR science and expertise. Various UK university departments have strengths in particular areas that IFR covers (such as biophysics of food structure, nutritional biochemistry or molecular microbiology), but no other UK institutions currently have quite the focus of IFR around a shared mission. We can see no added value (given the improving situation) in breaking up the core expertise at the institute only to re-form another equivalent structure elsewhere.

26. On a lesser, but still significant note, there is also undoubtedly value in the 'IFR brand' that carries an international reputation, particularly within Europe. There is a concern that the brand would be lost if the institute dissolved.

Recommendation 1: There is a need for a food science research institute in the UK to undertake mission-driven high quality research focussed in the Diet and Health area. The core expertise and capability currently within IFR provides a critical mass of researchers, and is a base upon which Council could build.

Options for governance

27. Accepting that BBSRC's capability in Diet and Health research is best delivered by building on IFR (rather than starting again) then the governance arrangements must:

- keep a core body of research, skills and training around a common mission or vision in Diet and Health
- continue to drive up the quality and relevance of the science, embracing external peer review
- promote more effective collaborations both within IFR and externally (nationally and internationally)
- support innovation and effective knowledge transfer with industrial stakeholders and public policy makers
- increase the value for money and transparency of BBSRC funding
- provide stability and financial sustainability for the institute
- provide clear lines of management and accountability

28. The aspiration must be for IFR to become an international leader in Diet and Health research and an intellectually attractive environment where the best scientists in the field want to spend time.

29. Of the governance options set out by Follett, Council has already discounted option 4 (improved present arrangements), and we do not consider that IFR would be viable as a wholly independent institution (option 2) as it lacks the critical mass that would

be required and it seems unlikely that it would be able to attract sufficient external funding.

30. Option 1 (transfer of assets) would see IFR leave BBSRC control and transfer to a university. Option 3 has two variants where IFR would remain as a stand-alone institute or be embedded within a university. Both of these involve IFR coming into direct BBSRC control. Whilst IFR is making progress, we can see no advantage in simply leaving it as effectively a stand-alone body and Council should be looking for more of a step change.

31. We conclude therefore that establishing much stronger links with the university sector – either option 1 or option 3 (embedded) – offers the greatest opportunity to develop the Diet and Health area and gain the most from IFR's expertise. Making the institute part of a larger grouping of related research activity would help raise standards but also promote synergistic interactions, with the expectation that the combined activities would be greater than the sum of the parts.

IFR in relation to the university sector

32. IFR already has collaborations with several leading university departments and other bodies. Council could fragment IFR and move key research groups to become parts of other appropriate HEIs. But this (as discussed above) would, in our view, lose the coherent 'mission' and associated added value of integrating a range of different food-related disciplines within one institute. We would also not favour a 'virtual institute' model that links dispersed groups together, as there is much to be gained from the physical co-location and mingling of research teams in obtaining the best synergistic interactions within an institute.

33. If IFR is to be embedded within a university then BBSRC should seek a university partner that can contribute its own critical mass and vision in the area of Diet and Health to complement IFR. There is a real opportunity for a new IFR/university partnership to become a leading centre in Diet and Health cutting-edge research, teaching and training.

34. In considering potential partners for IFR, universities with strengths in food science, diet and health include Leeds, Nottingham and Reading, all with departments rated 5* or 5 in the Food Science and Technology category in the latest Research Assessment Exercise (RAE, in 2001)[6]. None of these stands out above the others as an obvious choice of partner for IFR. It will be critical to build interactions with a medical school that has a strong and relevant research effort.

Norwich Research Park

35. The closer integration of the institute with the University of East Anglia (UEA) would appear an obvious choice in terms of location, building on existing links and common interests across the Norwich Research Park (NRP).

36. UEA has strong research groups in its Schools of Environmental Sciences and Biological Sciences (both within the Faculty of Science, and rated 5* and 5, respectively, in the RAE in 2001).

37. In contrast, the University's School of Medicine, Health Policy and Practice (within the Faculty of Health) and the Norfolk and Norwich University Hospital (NNUH) have both

[6] RAE 2001: http://www.hero.ac.uk/rae/

only recently been fully established. The new medical school was not assessed in its current form in the 2001 RAE; the former Department of Health Policy and Practice was rated 3a.

38. The UEA Faculty of Health and its medical school have expressed interests in Diet and Health research, among other areas[7], and IFR has already developed some useful contacts and collaborations. The establishment of the new hospital and medical school in Norwich with some complementary interests to IFR are clearly welcome developments. But the University does not yet appear to have built up a large cohort of research-active staff within that Faculty, and does not yet have a strong record in attracting funding from either BBSRC or MRC[8]. Neither does IFR currently have extensive interactions with the UEA School of Biological Sciences, since their interests do not seem to overlap to a large degree.

39. We also considered the possibility of merger of IFR with the John Innes Centre. The two institutes are adjacent on the NRP and have already embarked on some shared support functions, and there appears to be scope for more joint activities. However, the areas of science that the two institutes operate in are sufficiently distinct for full merger not to be a realistic option, in our view.

Recommendation 2: There is considerable merit in embedding the core expertise at IFR in the university sector and BBSRC should explore opportunities for a new Diet and Health partnership with leading institutions. Embedding the institute should be done so as to further develop the coherence of the strategically important research areas at IFR rather than fragmenting them across a variety of host institutions.

Transfer of IFR to a university (Follett option 1)

40. We are aware of BBSRC's involvement and funding of the EBRC development around Edinburgh that aims to create an international centre in animal bioscience by bringing together a large cohort of researchers from the Royal (Dick) School of Veterinary Studies with Roslin-NPU and others[9]. It seems to us that this model of interaction and integration would also benefit the area of Diet and Health, by establishing a large and vibrant body of research that could stand among world-leading centres in this crucially important field for human health and the economy.

41. We can see advantages in Follett's option 1 for IFR in exposing its science and researchers to a higher education environment, including undergraduate and more postgraduate students and a new culture. However, it would only be the option of first choice where strong cohorts of researchers are being brought together under a common strategy and vision and thus Council can have confidence that the new grouping will stand on its merits.

42. Unless BBSRC can identify an institution willing to make a substantial long-term, intellectual and financial commitment in Diet and Health, there is a danger in transferring IFR that Council would lose strategic influence over this area. The

---

[7] Research Activity within the School of Medicine, Health Policy and Practice: http://www1.uea.ac.uk/cm/home/schools/foh/med/research

[8] BBSRC success rates: http://www.bbsrc.ac.uk/funding/news/06_feb_4_success2004.html (2004-05); http://www.bbsrc.ac.uk/funding/news/06_07_28_success_rates.html (2005-06)
MRC success rates: http://www.mrc.ac.uk/ApplyingforaGrant/SuccessRates/index.htm

[9] EBRC News: http://www.mvm.ed.ac.uk/News/EBRCNewsFeb07.pdf

mission may drift as priorities change under the new parent institution, with the potential loss of national strategic capability.

Embedding IFR in a university (Follett option 3)

43. In the situation where there is no obvious and substantial HEI partner for IFR, we conclude that it should come under direct BBSRC control but be embedded in a university. In this model, it is essential that IFR and university researchers are co-located, with key joint appointments, shared facilities and joint students. They should collaborate actively and unite around a common strategic plan in Diet and Health research.

44. The scale and nature of the IFR/university partnership remains important, and if it is to be effective then it must be more that just a few university researchers interspersed within the current IFR. We would envisage a substantive input of university research staff, with senior joint appointments.

45. Under this arrangement, Council would retain more influence over the fate and direction of the embedded institute, while the university partner would benefit from the intellectual collaboration, the co-development of new joint research effort in Diet and Health and key joint appointments eligible for the RAE. The option would remain for Council that, if the partnership was successful, then it could move to full integration (Follett option 1) in the longer term.

Recommendation 3: In seeking a university partner for IFR, if the scale and vision of the partnership is such that Council has confidence in the long-term security of Diet and Health capability, then Follett option 1 would be attractive. Otherwise option 3 (embedded) is preferred in the first instance, with the possibility of moving to full integration and transfer to the university later.

Recommendation 4: When embedding IFR, BBSRC should be seeking to achieve the co-location of staff from each partner (with key joint appointments), sharing laboratory space and other facilities, such that a larger body of high quality research and training can be established. It will be essential that the IFR/university partnership comprises sufficient numbers to signify a genuine substantive collaboration.

'New blood' appointments and succession planning

46. New science appointments and succession planning are vital to underpin any new IFR/university partnership. There is an urgent need to bring in new blood and to develop clear succession planning for programme leaders and other key staff, particularly those who could retire in the next few years. These are issues recognised and underlined by the 2005 VG and although there has been some progress (for example, recent new appointments in systems biology and *Campylobacter* biology, which we strongly welcome) it has not gone far enough.

47. At the senior level, we urge the Director to make the necessary appointment in the much needed area of immunology. The current absence of a programme leader in Micronutrients (H2) should be taken as an opportunity to re-evaluate the institute's strategy in the area of nutrition research more generally, and appropriate leadership recruited urgently. We are aware also of the crucial service and high quality research provided by the Imaging Partnership. We were not persuaded that succession in this area had been considered properly.

48. We are concerned that each of the seven science programmes at IFR is vulnerable currently to the loss of just one or two key leaders – as has happened with Programme H2, Micronutrients. The IFR Director with support from the Governing Body has plans to recruit two new project leaders each year for five years. These plans need to be accelerated, particularly to attract dynamic mid-career researchers with potential for succession and leadership. Depending on the governance arrangements, then joint appointments with the university partner should be made.

49. A major ambition of a research institute or centre must be to develop a culture involving research students, post-doctoral workers, research and visiting fellows. We were very pleased to see a thriving and apparently happy community of culturally diverse research students and junior post-doctoral researchers at IFR, all of whom seemed genuinely pleased to have the opportunity to be there. The international reputation of IFR's science had been a key feature attracting such overseas researchers.

50. With the exception of a small number of Marie Curie fellows there seems to be much less of a culture of fellowships at IFR and a disappointing lack of any strategy to attract more. Independently funded research fellows are an effective way to import new skills, develop promising young scientists and support succession planning in the longer term.

Recommendation 5: Existing recruitment plans need to be accelerated, in particular at programme leader level in immunology and nutrition. A clear succession plan must be developed for programme leaders and other key staff.

Recommendation 6: The Director and programme leaders should develop a clear strategy for boosting the number of fellows at the institute. Council should consider creating a small number of institute fellowships awarded on a competitive basis to the new IFR/university partnership.

Future funding arrangements

51. BBSRC has experience in numerous funding models so it is not our intention to drill too deeply into possible funding arrangements encompassing a future IFR/university partnership except to emphasise the need for clarity on what Council and HEI funding is paying for and to have in place robust review mechanisms.

52. A key feature of an embedded IFR under options 1 or 3 will be the conversion of CSG funding to strategic programme grants. This is a critical step that, through independent external peer review, will further enhance the quality and focus of the institute's science and other activities within its new HEI environment.

53. We are aware that there has already been some effort at IFR internally to tension the quality of CSG programmes through a process of peer review by Governing Body members and others. We are unconvinced that this practice has been sufficiently robust, involving a relatively small pool of reviewers who were not all independent from the institute.

54. We endorse BBSRC's plans to ask the IFR Director to cast the institute's CSG funding in the form of a small number of integrated and properly costed (under FEC) five-year strategic programmes. These should naturally be consistent with the shared vision of the IFR/university partnership as this emerges.

55. Based on our discussions with the Director, potentially four strategic programmes (each with its own programme leader) emerge from IFR's current science strategy:

- Gut biology (encompassing the current programme G1 and elements of G2)
- Nutrition, Diet and Health (encompassing H1 and H2)
- Microbiology (S1, S2 and elements of G2)
- Food Biophysics (F1)

56. It seems to us that this would be a logical arrangement of programmes, which should all be multidisciplinary and subject to external peer review. Individual projects must operate across these programmes wherever appropriate and incorporate the FEC of facilities and services currently provided through the internal Partnerships.

57. Much will depend on the precise governance arrangements but under a funding model based around strategic programme grants it will be important for the Director to have a source of flexibility funding broadly equivalent to 'Quality Related' (QR) funding on the university side. At the Director's discretion this could be used, for example, to initiate new research, for pump priming or to build new collaborations.

58. The programme grants under FEC criteria should largely support the remodelled internal Partnerships through their costed use of the services provided. Where this is not fully the case then the Director would have the option to call on the flexibility fund.

59. Similarly, those Exploitation Platforms that have realistic prospects of commercialisation must move, within a finite time frame (e.g., 3-5 years), to be financially self-supporting. No Exploitation Platform should receive CSG for longer than a short start-up period which is supported by clear business planning. Where at present CSG supports a high proportion of the platforms in development, then in future this should be replaced by the Director's use of the flexibility fund with the requirement to balance any such use against other priorities.

Recommendation 7: BBSRC's funding for IFR within a new university setting should be in the form of a small number of independently peer reviewed strategic programme grants. The precise nature of these will depend on the strategic plans of the IFR/university partnership but the expectation is they will be multidisciplinary and fully integrated.

Change management

60. IFR has been through a period of considerable upheaval and consolidation, but further significant change is inevitable as a new IFR/university partnership develops and the funding model shifts. In view of this expectation, and also the need to embed more firmly across the institute the change of culture that has begun to be evident, we recommend that IFR senior personnel would benefit from external advice and coaching in the effective management of change.

61. The details of future management arrangements will depend on the nature and structure of the proposed new IFR/university partnership, but a matrix approach to management could be helpful in providing a framework for removing barriers between research areas and fostering integrated and multidisciplinary working.

Recommendation 8: Working with BBSRC, IFR should seek additional and professional support for change management in order to facilitate any future transition in structure and funding of the institute.

ANNEX 1

BACKGROUND TO BBSRC AND ITS SPONSORED INSTITUTES

BBSRC

1. The Biotechnology and Biological Sciences Research Council (BBSRC) is a Non-Departmental Public Body (NDPB) constituted by Royal Charter. BBSRC is one of eight UK Research Councils sponsored through the Government's Office of Science and Innovation (OSI), and forms part of Research Councils UK (RCUK).

2. BBSRC's mission, defined by Government and embodied in the Council's Charter, is:

   - to promote and support high-quality basic, strategic and applied research, and related postgraduate training, relating to the understanding and exploitation of biological systems;
   - to advance knowledge and technology, and provide trained scientists and engineers, which meet the needs of users and beneficiaries, thereby contributing to the economic competitiveness of the United Kingdom and the quality of life;
   - to provide advice, disseminate knowledge and promote public understanding in the fields of biotechnology and the biological sciences.

3. Users and beneficiaries of the Council's research and training include the agricultural, bioprocessing, chemical, food, healthcare, pharmaceutical and other biotechnological related industries, together with universities, Government departments and other public-sector organisations.

4. BBSRC's overall goal is to support science of international quality, relevant to its mission. The Council has a responsibility to sustain a broad base of interdisciplinary research and training in the non-medical life sciences which will help to create prosperity, improve the quality of life, inform policy-making or contribute in other ways to the public good. It seeks to develop research capabilities relevant to the needs of industrial and other users and beneficiaries to enhance the management and utilisation of biological resources.

BBSRC-sponsored institutes

5. BBSRC supports science in over 100 universities and other research institutions, mainly through the award of fixed-term grants for specific projects. The Council also funds work on a rolling, longer-term basis in a number of research institutes and other centres. In particular, seven institutes are currently "sponsored" by the Council and receive, on average, between one third and a half of their income from BBSRC.

6. The BBSRC-sponsored institutes are:

Babraham Institute (BI)	Cambridge
Institute for Animal Health (IAH)	Compton, Berkshire; Pirbright, Surrey
Rothamsted Research (RRes)	Harpenden; Broom's Barn, Suffolk
Institute of Food Research (IFR)	Norwich

Institute of Grassland and Environmental Research (IGER)	Aberystwyth; North Wyke, Devon
John Innes Centre (JIC)	Norwich
Roslin-NPU (RI)[10]	Edinburgh

7. These institutes receive core funding from the Council in the form of a Core Strategic Grant (CSG). The balance of institute funding comes from a number of other sources, including competitive research grants from BBSRC and other UK government sources, industry and the EU.

[10] The Roslin Institute merged with the IAH Neuropathogenesis Unit (NPU, formerly part of the Institute for Animal Health) from 1 April 2007. Subsequently Roslin-NPU together with parts of the University of Edinburgh (veterinary school) and of the Scottish Agricultural College will form a new Institute, the EBRC.

ANNEX 2

PANEL MEMBERSHIP AND ACKNOWLEDGEMENTS

MEMBERSHIP

1. Council set up an independent panel of experts (drawn from academia, industry and another relevant funding body) to assess the progress made by IFR in implementing its strategic plan and improving the quality of the science it undertakes, and to advise on options for future delivery of the science areas.

2. The panel comprised:

Professor Quintin McKellar FRSE (Chair, member of Council)	The Royal Veterinary College
Professor Simon Foster	University of Sheffield
Professor Anne-Marie Hermansson	SIK – the Swedish Institute for Food and Biotechnology
Professor Barry Hirst	University of Newcastle
Professor Douglas Kell	University of Manchester
Dr C V Natraj	Unilever Research
Professor Charles Penn	University of Birmingham
Professor Colette Shortt	McNeil Nutritionals Ltd
Professor David Thompson	University of Manchester
Dr Andrew Wadge	Food Standards Agency

3. The panel included members who had served on the Visiting Groups that reviewed IFR as part of the Institute Assessment Exercises in 2001 and/or 2005.

4. The review took place between January and April 2007; the review panel met three times. At the panel's visit to IFR on 1-2 March 2007, the following staff from BBSRC Office attended: Professor Nigel Brown, Dr Paul Burrows, Dr Huw Tyson, Mr Peter Hurrell.

ACKNOWLEDGEMENTS

5. BBSRC and the review panel wish to thank Professor David White (IFR Director), Professor Peter Lillford CBE (Chair of the IFR Governing Body) and IFR staff for their co-operation, hard work and time put into this review.

ANNEX 3

INFORMATION REVIEWED BY THE PANEL

1. To enable the panel to undertake this review of IFR, the institute was asked to provide a report describing the progress it had made in implementing its science strategy and the recommendations of the Institute Assessment Exercise (IAE) in 2005. The institute's report (unpublished confidential document) was provided to the review panel, together with background information compiled by the review secretariat at BBSRC.

2. The documentation provided to the panel included the following items:

From Institute Assessment Exercise in 2005

- IFR Director's overview (unpublished confidential document)
- Visiting Group report[1] (plus confidential annexes)
- IFR response to the Visiting Group report (unpublished confidential document)

BBSRC and IFR reports and strategy documents

- IFR Strategic Plan 2005 – 2010 (IFR, 2005)[2]
- Follett review of governance of BBSRC-sponsored institutes (BBSRC, 2006)[3]
- BBSRC High Level Food Research Strategy (BBSRC, 2007)[4]
- Diet and Health Research Industry Club ('DRINC' – BBSRC proposal for a new scheme for co-funding by industry of BBSRC-supported research, December 2006)[5]
- Science and Innovation in BBSRC-sponsored Institutes (BBSRC, 2005)[6]

Other background information

- IFR organisational structure
- IFR programme financial and staffing information
- IFR publications statistics
- University of East Anglia – background information from published sources

3. The review panel visited IFR on 1-2 March 2007. The IFR Director and staff gave presentations on (and discussed with the panel) the institute's research programmes, exploitation platforms and internal partnerships, as well as plans for future research, exploitation and institute governance.

---

[1] *Report of the Visiting Group to the Institute of Food Research* (BBSRC, 2005) available from http://www.bbsrc.ac.uk/about/pub/reports/06_feb_visitinggroups.html

[2] *Strategic Plan 2005 – 2010* (IFR, 2005) available from http://www.ifr.bbsrc.ac.uk/publications/default.html#strategicplan

[3] *Report of an independent review of governance of BBSRC-sponsored Institutes* (BBSRC, 2006) available from http://www.bbsrc.ac.uk/media/pressreleases/06_10_24_welcome_follett.html

[4] http://www.bbsrc.ac.uk/about/pub/reports/07_feb_foodresearchstrategy.pdf

[5] http://www.bbsrc.ac.uk/media/pressreleases/07_04_03_food.html

[6] http://www.bbsrc.ac.uk/about/pub/policy/institutes.html

ANNEX 4

ABBREVIATIONS

BBSRC	Biotechnology and Biological Sciences Research Council[1]
CSG	core strategic grant (BBSRC core funding for its institutes)
DRINC	Diet and Health Research Industry Club (BBSRC funding scheme for research underpinning the UK food industry)
EBRC	provisional name for a new institute being established within the University of Edinburgh
EFSA	European Food Safety Authority[2]
EU	European Union
FEC	full economic cost
FSA	Food Standards Agency[3]
GI	gastrointestinal
HEI	higher education institution
IAE	Institute Assessment Exercise[4]
IFR	Institute of Food Research[5]
NNUH	Norfolk and Norwich University Hospital
NRP	Norwich Research Park (includes IFR, John Innes Centre, NNUH, Sainsbury Laboratory, UEA)[6]
RAE	Research Assessment Exercise[7]
UEA	University of East Anglia[8]
VG	Visiting Group – review panel for the Institute Assessment Exercise, most recently in 2005.

[1] BBSRC www.bbsrc.ac.uk/
[2] EFSA http://www.efsa.europa.eu/en.html
[3] FSA http://www.food.gov.uk/
[4] IAE www.bbsrc.ac.uk/about/pub/reports/06_feb_visitinggroups.html
[5] IFR www.ifr.bbsrc.ac.uk/
[6] Norwich Research Park www.nrp.org.uk/
[7] Research Assessment Exercise 2001 www.hero.ac.uk/rae/
[8] UEA www.uea.ac.uk