



Strategy Document 2013

A Strategic Review of UK Dairy Farming's Priorities for R&D and Knowledge Exchange for 2013- 2020

Research and Development Sub Group – Terms of Reference: 'What are the key priorities for R&D and how can R&D funding be better coordinated?'

Introduction

Research and development has played, and will continue to play, a key role in maintaining a competitive and sustainable UK dairy industry. Over the last twenty years there have been significant changes in funding arrangements for dairy related R and D, with government funding (until recently) focused on more fundamental aspects of research and on environmental issues. In parallel, funding for applied research from commercial organisations eg ICI, Dalgety etc has contracted and, until recently, even the dairy levy organisations offered limited support for applied R and D.

The net effect of these funding reductions has been a significant contraction in the capacity to undertake applied R and D in dairying within the UK, coupled with a loss of scientific and technical expertise.

All is not lost however, as there are now encouraging developments in relation to increased funding for applied R and D to support the dairy sector (BBSRC, DEFRA, Technology Strategy Board (TSB), Devolved Administrations, Dairy Co, Milk Processors). The key challenge which the industry now needs to address is how best to achieve effective co-ordination of funding to enable large scale, multidisciplinary, applied dairy research programmes across a number of UK research providers.

Issues for Consideration

- (a) Co-ordination of funding. Within the UK we have a large number of funding bodies (BBSRC, DEFRA, TSB, Devolved Administrations, levy organisations etc) supporting dairy related R and D. Furthermore, all of the major research providers participate in EU funded research programmes with a significant applied dairy research component eg SOLID, Animal Change, Robust Cow etc. Historically, there has been a particular disconnect between UK and EU funded research, although this issue appears to have been addressed in the proposed EU Horizon 2020 programme.

Better co-ordination of R and D activity is required to maximise the benefits of research and to ensure that the UK dairy industry remains competitive in the global market. This could be achieved by a more focused approach to R&D based on fewer, larger programmes rather than the current "project-based" approach. An excellent example of this is the current UK Agricultural Greenhouse Gas Research Platform – a £12.6m programme funded jointly by Defra and the devolved administrations and involving 16 research providers.

Recommendation

The Dairy Science Forum seeks to take a lead role in bringing together the main funders of dairy R and D to discuss research priorities for the next two decades and to explore opportunities for improved co-ordination.

- (b) Securing greater involvement of food retailers (and milk processors) in funding of dairy related R and D. Whilst milk processors have shown increasing interest in funding dairy related R and D in recent years, funding from the large retailers (with one or two notable exceptions) has been extremely limited.

Recommendation

The Dairy Science Forum will play a key role in engaging with the large retailers to highlight the benefits and opportunities of participating in applied dairy R and D.

- (c) Gaps in scientific expertise/capacity. Reductions in funding for applied R and D over the last twenty years have resulted in a loss of scientific and technical expertise in applied dairy research. A review of scientific and technical capacity across UK research providers is required to identify gaps in expertise and to inform prioritisation of postgraduate training.

Recommendation

The Dairy Science Forum, in conjunction with the British Society of Animal Science, will undertake a review of current scientific and technical capacity within the UK in dairy related R and D, with a view to informing prioritisation of postgraduate training.

- (d) On farm versus research centre based research and development. Historically applied dairy research in the UK has had a significant research centre focus. However, the level of data recording and technical expertise on many commercial farms is at least as good, if not better in some cases, than that available in research centres. Whilst the value of such data sets is recognised by geneticists, there is much greater scope to make use of on farm data in relation to animal health, fertility, animal welfare and nutrition.

Recommendation

The Dairy Science Forum will take the lead in highlighting the value of the “dairy farm database” within the UK and will lobby for more effective co-ordination of farm data at a national level.

Conclusions

Reductions in funding for applied research in the UK in the last two decades have resulted in a contraction in applied dairy R&D and a decline in scientific and technical capacity. A renewed emphasis on the coordination and funding of applied, dairy related R and D, is required if the UK dairy industry is to remain competitive and respond to the new market opportunities for dairy products in the next decade.

The Dairy Science Forum calls for a fundamental review of current scientific and technical capacity in dairy related R&D, followed by an industry wide analysis to consider future research priorities and optimum methods of delivery to the industry.

Appendix

Dairy Research and Development Priorities

The problematic components of the dairy industry that need further research may be exclusive to the industry (such as milk composition) or of wider interest (such as forage feed value). The priority given to each problem must depend on its current importance, its likely importance in the future and the likelihood of its being solved by research. The Forum considers that the topics below should be considered as key R&D priorities in relation to consumers, environment and animal health and welfare.

Improving forage feed value. There has been no real improvement in the feed value of grazed grass or grass silage in the last 20 years, and milk production from forage has decreased. In parallel there is the increased requirement for cereals for human consumption, which must result in increased production from forage being a major driver in the years ahead.

Tailoring of milk constituent levels to market demand. There has been no change in milk fat or protein concentration in 15 years and no real response to reflect changing market trends. Milk composition needs to better reflect market demand both in relation to gross composition and component constituents

Reversing the decline in dairy cow fertility. Internationally, dairy cow fertility is falling at the rate of 1% per annum, and the decline is similar in the UK. Application of genomic selection in dairy cattle breeding offers considerable scope to address this problem.

Improving cow longevity. The national dairy herd replacement rate currently is estimated at 33%, in other words, the average UK dairy cow survives for only three lactations. This has a dramatic negative effect on overall industry efficiency while improved longevity would significantly reduce climate change effects per unit of output.

Improving nutrient management. Compliance with EU Nitrates and Water Framework Directives present a significant management challenge to dairy farmers in many parts of the country. Currently the losses of N and P to watercourses are a major problem. Research and KE is needed on how to improve efficiency of fertiliser use, increase manure storage requirements, process manure prior to application, and advanced spreading methods.

Understanding factors affecting greenhouse gas emissions and air quality. The livestock sector is a contributor to climate change, mainly through methane and nitrous oxide emissions. In addition, the livestock sector is a source of ammonia. Ammonia contributes to atmospheric particulate levels, which are a concern for human health. In order to comply with EU, UK and Devolved Administration Climate Change Legislation, and any future legislation concerning ammonia emissions, there is a need to better understand the factors influencing emission levels and appropriate mitigation strategies.

Improving animal health. Excellent animal health is integral to a productive and sustainable industry and also has a direct effect on reducing environmental impact (healthy animals are more productive and so fewer are required).

Specific research priorities for animal health:

- Strategies for better detection, prevention and control of endemic diseases
- Development of prevention strategies for exotic diseases
- Eradication of bovine TB (e.g. by improvement of vaccines)
- Prevention of lameness

Measuring and assessing animal welfare. The need to objectively measure and record cattle welfare remains a key issue, particularly across different disease scenarios and management systems. A growing number of very large herds can be expected in the coming years and a study of the management of such systems and in particular the high-yielding 'housed cow' will be required. There is currently little scientific investigation of the effect of herd size on cow health and/or welfare.

Specific research priorities for animal welfare:

- Evaluation of health and welfare in large herd systems, combined with
- Evaluation of indoor housing and automation on cow health and welfare

Alternative systems of dairy production. Commercial dairying is moving to a model based on large, housed herds with high inputs and high yields. In the future, economic or social concerns may render this model unviable, and simpler systems need to be formulated and assessed.