

Research and Development

**Final Project Report**

(Not to be used for LINK projects)

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Project title	Review of Livestock Nutritional Standards		
DEFRA project code	LS1615		
Contractor organisation and location	British Society of Animal Science PO Box 3 Penicuik Midlothian EH26 0RZ		
Total DEFRA project costs	£ 30,965		
Project start date	01/10/01	Project end date	31/03/02

**Executive summary (maximum 2 sides A4)****PROJECT SUMMARY****Objectives**

The objective of this project was to review the available information on nutritional standards for farm livestock in relation to the current needs of UK stakeholders. Since the disbanding of the Technical Committee on Responses to Nutrients in 1990, there has been no UK body responsible for reviewing information and producing an up to date view on nutritional standards. Such information is required by DEFRA to inform policy decisions in areas including animal health and welfare and pollution reduction, and by industry to form the basis of practical advice.

**Methodology**

The project management team convened a national steering committee representing the major UK stakeholders. This grouping identified a team of specialists to review each of the major farm livestock species (dairy cattle, beef cattle, sheep, pigs, poultry for meat and eggs) and agreed a remit for the work of these teams. Each team was headed by an academic nutritionist and included a representative of the compound feed sector and the primary production sector.

The remit given to the teams was:

1. To form a species working group with, in addition to the academic sub-contractor, a representative of the feed supply industry and the species production sector to act as assistant reviewers.
2. To review for their livestock species the information currently available internationally on nutrient requirements:

- Identifying the published standards currently available for that species nationally and internationally and the extent to which they are used in practice.
  - Assessing the extent to which they cover the full range of nutrients and factors that influence availability.
  - Assessing the extent to which they are up to date in relation to the information available for the different nutrients.
  - Assessing the scientific quality of any modelling approaches used, and hence the validity of conclusions.
  - Assessing the extent to which the scientific basis of the information makes it relevant to extrapolate to current UK circumstances (e.g. genotypes, production systems)
3. To identify areas in which the current provision of information is inadequate to meet the functional needs of UK stakeholders:
    - Reviewing the current needs of UK stakeholders in relation to their species in the context of genetic change, and societal concerns relating to animal welfare, environmental protection and food safety.
    - Identifying the extent to which current published standards meet these needs, and prioritising the areas in which information is inadequate or areas of requirements that are not addressed.
  4. To make this information available to the BSAS Nutritional Standards Group for dissemination to interested parties in UK government, industry and academia:
    - Producing a written report covering areas 2 and 3 above
    - Responding to feedback from the project Steering Committee and clarifying any points arising in a final version of the report, to be posted on the BSAS Nutritional Standards website.
    - Delivering an oral presentation for discussion at the Annual Meeting of the British Society of Animal Science.

#### Review output

The individual species reports, each revised following discussion of draft reports at a meeting of the Nutritional Standards Steering Committee on 13 February 2002, are included separately in this final project report. Each species report highlights deficiencies in knowledge and priorities for future investigation specific to that species. However, a number of common conclusions arose from these reports and discussions at the Steering Committee review meeting:

1. That the change in research funding policy meant that much information resulting from research in the private sector was available for 'in house' use but not publicly available. Similarly, scientific review could not always be viewed as presenting an unbiased picture, since commercial funding of nutritional research now influenced whether or not negative results were published.
2. That requirements for energy and protein were, in general, well researched with adequate information currently available, or soon to become available, in the public domain.
3. That a range of models for estimating energy and protein requirements for productive functions had been developed in both the public and private sector. These were fine-tuned by individual users and considered adequate for practical use by informed specialists.
4. That there was a need for simple practical standards for home-mixers and smaller compounders who did not have the resources for 'in house' generation and interpretation of experimental results.
5. That the requirements for minerals, especially trace elements, and for vitamins most urgently required more detailed review. In many cases, current published standards were seriously outdated and varied greatly from inclusion rates being used in practice.
6. That nutritional influences on health and welfare, as opposed to production, parameters required more detailed review. There was a particular need to review nutritional influences on immune function.
7. That there was a need to develop agreed methodology for nutrient budgeting approaches which balanced cost effective production with requirements of legislation designed to reduce pollution arising from farm livestock enterprises.
8. That there was a need to review long term residual effects of nutrition at critical developmental times; for example effects of maternal nutrition on foetal programming, and immediate post-hatching nutrition in poultry.

### Technology Transfer Activity

The reports were presented by the species co-ordinators in a dedicated session at the Annual Meeting of the British Society of Animal Science in York on 9 April 2002. The following section summarises the points raised in presentation and discussion.

#### PIGS AND POULTRY

**Energy and protein:** Extensive reviews of energy and protein requirements had been carried out recently, for all but weaner pigs where a dearth of information had been identified. There had been no request from the major compounders of pig feeds for a review of energy and protein standards since they had in-house information. However, due to commercial considerations, they were not prepared to share their information. Therefore, smaller feed manufacturers and home mixers required summary tables of standards.

The same situation exists for poultry.

**Minerals and vitamins:** For pigs, current rates of supplementation are far removed from outdated estimates of requirements. In exceptional cases supplementation is 20 times the calculated requirement. Either supplementation rates are excessive or the existing standards need to be revised. Standards should be based on requirements with sensible safety margins.

**Welfare:** Pig and poultry welfare is an issue in setting nutritional standards. For pigs the welfare issues are fairly well defined but poultry issues need to be defined.

#### RUMINANTS

**Energy and protein:** The potential use of results from the Food into Milk (FiM) project would be delayed due to the agreement with the commercial sponsors of the project to allow them exclusive access to the results until 2003.

There was a call for full disclosure of nutrient contents by feed manufacturers. This is happening for macro-nutrients and over 90% of feeds disclose ingredients. When 100% disclosure commences it will be possible to calculate the full nutrient content.

**Welfare:** Welfare is referred to in the discussion document but has not been given the same emphasis as in pigs and poultry.

**Youngstock:** Existing standards for replacement Holstein heifers calving at about 2 years old may be sufficient for future use. Calf standards are to be reviewed, especially milk replacer allowances during the first three weeks.

**Product quality:** Manipulating product quality by nutrition is not a major area of interest in ruminants, given the lack of demand from consumers and the lack of buyer premiums for nutritionally enhanced products.

Each of the species reports has been posted on the BSAS website (<http://www.bsas.org.uk>). A Press Release was published by BSAS to raise awareness of the availability of the reports.

Articles are being written for the popular press to further disseminate the findings to end users. Submission of these is being co-ordinated by the BSAS Publicity Officer to ensure prior approval from DEFRA.

### Proposals for future action

A further meeting of the project Steering Committee will be convened in summer 2002 to discuss future priorities and opportunities. Subjects identified for potential future action include:

- An initiative to produce simple updated nutritional standards for home mixers.
- Exploration of opportunities for European co-ordinated activity to agree nutrient balance approaches to production/pollution issues. Initial discussions have taken place with the Nutrition Commission of the European Association of Animal Production, which might facilitate such a forum.
- Discussion with government and industry stakeholders regarding future initiatives on identified species priority areas.

Project  
title

Review of Livestock Nutritional Standards

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**Scientific report (maximum 20 sides A4)**

See attached.

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