

## Harper Adams University PhD studentship (Three years)

### Improving the nutrition and management of dairy cows: investigating social factors that influence health in the transition period

#### Background

The transition period (3 weeks before and after calving) is arguably the most critical period in the dairy cow's production cycle. Failing to meet the cow's nutritional requirements and mismanagement before and after calving commonly lead to what are known as 'production diseases' such as hypocalcaemia, mastitis, ketosis, hypomagnesaemia, retained placenta, displacement of the abomasum and laminitis (Mulligan & Doherty, 2008; Van Saun & Sniffen, 2014). The prevalence of these production diseases can be high and appears to be increasing. For example, the incidence of sub-clinical ketosis has been reported to be approximately 22% in European dairy herds (Suthar *et al.*, 2013), whilst in North America a rate of 43% has been reported (McArt *et al.*, 2012). This is also a period when cows are immunosuppressed, and changes in hormonal and metabolic status triggered by stress factors such as changing diets, inadequate feed intake, calving and transition to the milking herd can all significantly affect cow welfare (Aleri *et al.*, 2016). In addition to the impairment of health and welfare, these production diseases of the transition period can also lead to premature culling, and reduce overall herd economic efficiency and profitability at both an individual farm and national herd level. There has been a large body of research on how best to feed and manage dairy cows during the transition period, and the implications of poor practice on cow health, welfare and farm profitability. In contrast, there has been virtually no research undertaken on social factors that influence the application of best practice on farm.

#### Aims

Given the significance of the transition period in dairy production, this PhD project will investigate the following three key research questions:

1. What is being done at farm level to manage the transition dairy cow, and what are the respective roles of farmers, nutritionists and veterinary advisors in optimising cow health and welfare during this period?
2. Are the perceptions of the success or failure of transition cow management supported by what is actually happening at farm level?
3. How do these case studies benchmark against management practices and standards across the wider dairy industry in the UK?

#### Methodology

This project will utilize a combination of both social and biological sciences to assess transition cow nutrition and management on a series of case study dairy farms in England. To investigate how scientific knowledge and industry best practice advice is being implemented at farm level, the project will utilise a qualitative methodology involving semi-

structured interviews with a range of relevant stakeholders involved in transition cow health and welfare including dairy farmers, vets, dairy consultants and nutritionists. To make objective scientific assessments of how well transition cows are being fed and managed on these case farms, a series of measurements will be made, including biochemical analysis of samples such as feed rations and milk. Cows will also be body condition scored, and an assessment made of dry cow housing looking at factors such as trough space, water quality, stocking density, cow comfort and calving management. Herd health records and basic production parameters will be assessed. Based on the findings of these case studies, the information gathered will then be used to formulate and conduct a nationwide questionnaire survey on transition cow management practices across the wider dairy sector.

### **Benefits to the UK dairy industry**

The project will be of interest to highly motivated candidates with a strong interest in dairy cow health, nutrition and husbandry; the use of social science methodologies in research; and the desire to apply scientific knowledge to the service of agriculture and veterinary science. The study will provide an evidence base on which to focus future knowledge exchange with farmers, veterinarians, consultants and dairy nutritionists. The project will make recommendations concerning the key challenges in implementing industry best practice for the optimal management of the transition dairy cow, with the overall aim of improving dairy cow health and welfare.

### **References**

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McArt, J.A.A., Nydam, D.V. & Oetzel, G.R. (2012) Epidemiology of subclinical ketosis in early lactation dairy cattle. *Journal of Dairy Science*, 95, 5056-5066.

Mulligan, F.J. & Doherty, M.L. (2008) Production diseases of the transition cow. *The Veterinary Journal*, 176, 3-9.

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Van Saun, R.J. & Sniffen, C.J. (2014) Transition cow nutrition and feeding management for disease prevention. *Veterinary Clinics: Food Animal Practice*, 30, 689–719.

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