AgriSearch Appoint Research Fellow

Dr Gareth Arnott has joined AgriSearch as a research fellow in international dairy production based at the Institute for Global Food Security in Queen's University Belfast.

A native of Co Down, whose school and university holidays were spent milking cows, Dr Arnott will fulfil a key role in identifying dairy research results elsewhere in the world of potential value to milk producers in Northern Ireland and make this information easily available to farmers

This will also allow him to identify gaps in current dairy science knowledge thus helping guide the direction of locally conducted research.

James Campbell, right, chairman and vice chairman David Workman congratulated Dr Gareth Arnott, centre, on becoming AgriSearch international dairy research fellow.

AgriSearch as part of the European Cattle Innovation Partnership is already sharing research findings with other levy bodies and considering areas of possible future scientific collaboration.

An industry funded organisation AgriSearch, the NI Agricultural Research and Development Council, part funds trials of practical advantage to milk, beef and lamb producers.

Aside from this knowledge transfer role as a research fellow Dr Arnott will work closely with AFBI and AgriSearch to develop opportunities for scientific work aimed at ensuring the Ulster dairy sector is both profitable and competitive.

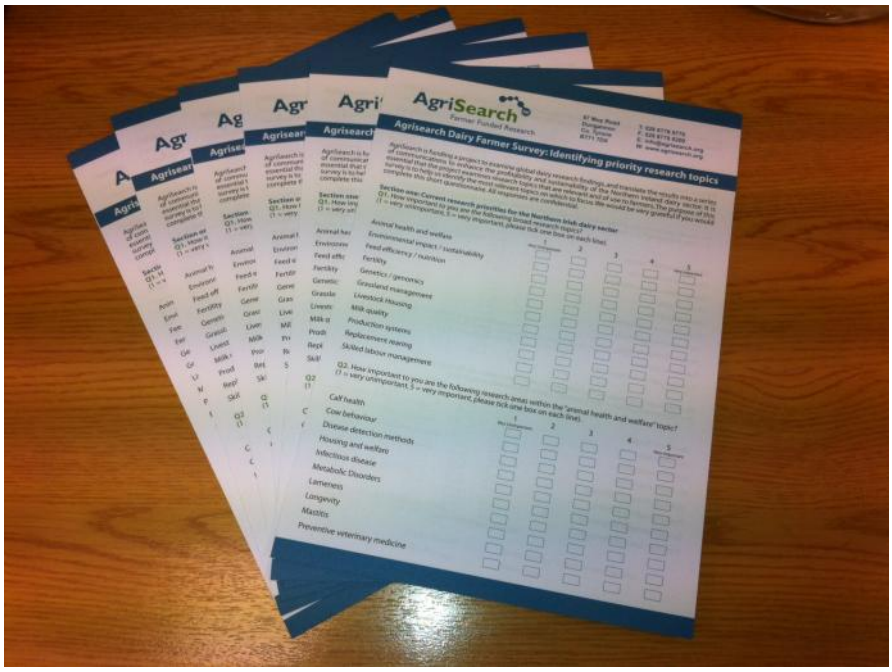
On graduating in biological science from the University of Bristol Gareth returned to Belfast to study for a MSc. and PhD in animal behaviour at QUB. He then undertook further research into animal behaviour and welfare at the SRUC Roslin Institute, Edinburgh for almost four years and into behavioural ecology at the University of Melbourne having been awarded a McKenzie research fellowship.

Outside of research Dr Arnott enjoys dog training and distance running in which he has competed at international level.

As part of Gareth's new role a survey has been produced with the purpose of identifying the most relevant dairy research topics on which to focus. The content of this survey was informed by a series of interviews with representatives across the dairy industry in Northern Ireland.

With the help of dairy processors, the survey is being distributed to dairy farmers throughout Northern Ireland. We would like to thank them for their assistance in this matter.

The survey is designed to enable producers to make an active contribution to the NI dairy research agenda. AgriSearch would therefore be very grateful if you could take the time to complete their short questionnaire. All responses are confidential and please return completed questionnaires to AgriSearch in the prepaid envelope provided.



Ards Suckler Syncronisation Farm Walk

SAM Chesney of Kircubbin, Co Down hosts a farm walk next Tues, September 10th at 2pm examining the role of synchronisation and Artificial Insemination in getting suckler heifers in calf earlier.

Zoetis, Genus ABS and AI Services recently joined forces with AgriSearch to fund a pilot study undertaken by AFBI to evaluate the role of oestrus synchronisation and the use of Artificial Insemination in ensuring suckler replacements calve at 24 months of age. There is limited data on the conception rate of beef heifers in synchronisation programmes, but success so far has been limited.

AgriSearch NI
Farmer Funded Research

afbi Agri-Food and Biosciences Institute

cafre College of Agriculture, Food & Rural Enterprise

BEEF FARM WALK

Tuesday 10th September at 2pm
Sam Chesney,
Cool Brae Farm, 49 Inishargy Road,
Kircubbin, County Down, BT22 2RQ

Topics include:

- Rearing regimes for suckler replacements
- Selecting suitable synchronisation protocols
- Best practise guidelines for synchronisation and AI
- Sire selection for heifers
- Managing winter fodder supplies

All welcome

The objective of this pilot study was to determine calving rates for selected synchronisation methods on suckler farms where feeding management ensures replacements are an appropriate size for breeding at 14 months of age and there are no significant animal health issues.

AI has major benefits for the beef industry in terms of exploiting genetic progress through the widespread use of bulls with proven high Estimated Breeding Values (EBV's).

With 24 month old first calving heifers, selecting proven AI bulls with high EBV's for calving ease and low birth weights is an excellent way to reduce calving difficulty and calf mortality. However, a limiting factor for the use of AI on many

suckler herds in Northern Ireland has been the labour requirement associated with heat detection

It is well recognised that good heat detection is a critical component of AI breeding programmes, with poor heat detection a major factor associated with low conception to AI. Recently, novel synchronisation methods have been established which eliminate the need for heat detection. This could help reduce the labour requirement and overcome the potential problems of poor heat detection.

The current study evaluated a novel synchronisation regime with fixed time AI (method B) relative to a traditional synchronisation regime (method A) with heat detection (Table 1). To-date 140 heifers on 5 commercial farms across Ulster have been involved in the study.

Preliminary results show similar success using both regimes with average conception rates to first service of 58% and 57 % respectively. Feedback from farmers involved has been very positive, particularly for the synchronisation regime (method B) allowing fixed time AI and thus removing the need for heat detection.

Further data from this pilot study will be presented at the AgriSearch promoted farm walk this coming Tues, Sept 10 at 2 pm on the award winning Co Down farm of Sam Chesney, 49, Inishargy Rd, Kircubbin BT22 2RQ.

Table 1. Synchronisation protocol for beef heifers involved in study

Day	Synchronisation method A	Synchronisation method B
0	Veterinary examination Insert CIDR Inject GnRH	Veterinary examination Insert CIDR Inject GnRH
5		Remove CIDR Inject PGF2α
7	Inject PGF2α	
8	Remove CIDR	Inject GnRH Fixed time AI
9-11	Heat detect and AI on standing heat or fixed time at day 10 &11	

LMC Funding for AgriSearch Sheep Research Programme

AgriSearch is pleased to announce that for the second consecutive year it has secured funding from the Livestock and Meat Commission for Northern Ireland towards its sheep research programme.

Speaking at the recent NSA Sheep Event AgriSearch Sheep Advisory Committee Chairman Samuel Wharry said *"LMC's contribution to AgriSearch's sheep budget has given a much needed boost to AgriSearch's sheep programme and we would like to express our gratitude to the LMC for their support".*

LMC Chairman Pat O'Rourke commented on LMC's support to the AgriSearch sheep research programme, "The sheep sector in Northern Ireland plays a vital role in sustaining livestock farming and rural communities across the Province, particularly in disadvantaged areas where other forms of farming are not an option. Sheep farmers are specialised practitioners and we are delighted to be able to work with AgriSearch to substantially leverage essential funds for research to help inform the continued development of a sustainable and profitable sheep farming sector in Northern Ireland".

The new package of funding will go towards three sheep projects:

- Investigation of the relationship between genotype, trace element status and gastrointestinal parasite infections in lambs, and the development of nutritional and management strategies to increase lamb output from grazed grass.
- Development of a field guide to lameness diagnosis and treatment in sheep
- Provision of a ewe-recording service to the Northern Ireland Sheep Industry (Hillsborough Recording Scheme)

AgriSearch Sheep Advisory Committee Chairman discussing LMC's funding of AgriSearch's Sheep Research Programme with Pat O'Rourke Chairman of the Livestock and Meat Commission

Research to lower the Greenhouse gas (GHG) emissions from Northern Ireland Beef

Recently, the AFBI beef research programme, which is funded by DARD, AgriSearch, DEFRA and the devolved administrations, has measured methane emissions from cattle under a range of production systems, to address the major uncertainties associated with Greenhouse gas (GHG) emissions, particularly from hill systems. In these studies, we have shown that differences in methane emissions are largely related to forage intakes by the animals. Essentially, the higher the intake of the animal, the greater is the amount of rumen digestion and therefore the greater is the methane emission. However, the level of performance relative to methane emission needs also to be considered. For example, an animal consuming less feed per day will have a lower daily methane emission, but may take a greater number of days to reach slaughter, thus generating higher GHG emissions per kg of beef produced.

Research findings to date have not indicated breed differences, but beef produced from the suckler herd has higher GHG emissions relative to beef produced from the dairy herd (18.3 and 9.7 per kg CO_2 per kg beef). This is mainly a consequence of the methane emissions associated with maintaining the suckler cow. However, at an individual farm level, there are a number of ways in which a farmer can try to reduce their GHG emissions. These include: calving replacement heifers at 24 months; ensuring a tight calving interval; selecting high genetic merit animals; and ensuring good grassland management etc.

More information on GHG emissions will be available at the forth coming Sustainable Farming in the LFAs events at Greenmount Hill Farm and Russell Scott's Farm on the 24th and 26th September respectively.

Measuring methane emissions from beef cattle grazing upland pasture

Sam & Crosby Step Up

Samuel Wharry, Harphall, Carnlough has been appointed chair of the AgriSearch sheep advisory committee in succession to upland farmer Ian Buchanan, Dungiven, who has stepped down after the maximum term of service on this committee.

Well known as NI chair of the National Sheep Association, Sam is a hill farmer much involved in breed improvement and lamb marketing initiatives. The new vice chair of the advisory committee is lowland lamb producer Crosby Cleland from Saintfield.

As the name suggests the committee exists to advise the AgriSearch Board of Trustees on research worthy of support as being likely to maximise margins from lamb production.

The current advisory committee members are:
Sam Wharry (Chair), Crosby Cleland (Vice Chair), Campbell Tweed, Isaac Crilly, David Wallace, Edward Adamson, Barry Brogan, Jonathan Birnie, Colin Smith, Seamus Maginn and Raymond Steen.

David Workman, left, vice chair AgriSearch Board of Trustees with the newly appointed chairman of the sheep advisory committee Sam Wharry centre and vice chairman Crosby Cleland. Welcoming them to their new volunteer roles

AgriSearch hosts European Cattle Research and Development Meeting

The practical results of close links between farmers and research scientists impressed visitors attending a European Cattle Innovation Partnership, ECIP, meeting held in Northern Ireland.

Representatives of farm research levy bodies from the Netherlands, Denmark, Sweden, France, UK and the Irish Republic visited AFBI, Hillsborough and the Kircubbin, Co Down 'UK dairy farm of the year 2012' of William Steele, who runs a 450 cow herd with sons Thomas and Samuel

All these funding organisations belonging to the European Cattle Innovation Partnerships are committed to sharing results so as to make best use of limited funds by minimising duplication of research work.

The ECIP, whose membership includes AgriSearch, the Northern Ireland Agricultural Research and Development Council, is planning a joint research project relating to phosphorus in agriculture. It is hoped to obtain major funding from the EU for applied research to help solve phosphate problems seen in several member states.

At the Agri-Food and Biosciences Institute, AFBI, Hillsborough Dr Alistair Carson gave the international group an over view of current and planned R & D projects, including those supported by the dairy sector through AgriSearch Researchers Tianhai Yan and Dr Conrad Ferris then gave an update on environmental issues before the party were shown around by Chris Johnston, Dr Steven Morrison and Dr Conrad Ferris for further briefings on beef research, BOVIS and the EREC.

The European group was shown the Steele family farm on the Ards Peninsula because it is one of several involved as co-researchers with AFBI. This link between farmers and scientists to extend research investigations

Members of the European Cattle Innovation Partnership listening to presentations during a visit to the Steele family farm at Rowreagh, Kircubbin

across large numbers of cows in practical farming circumstances is normal in NI. However it greatly impressed the visitors from several nations where this system of on-farm research is a novelty.

The rotary milking parlour at Thomas Steele's

On arrival the ECIP party was given an overview of management practices on this high input farm currently involved in a Research Challenge Fund, RCF, project examining early lactation feeding strategies and the recently completed RCF project on dry cow feeding.

This 450 cow dairy unit is also one of the farms currently taking part in the EU Dairyman project. During the farm visit Dr Alistair Carson made a presentation on the role of 'on-farm' research programmes with Dr Conrad Ferris providing an overview of RCF project results, while John Bailey reviewed the activities of Dairyman.

Then followed a lively 'question and answer' time as Thomas Steele took the group on a tour of the Rowreagh Farm's dairy unit based around a rotary parlour used to milk 450 cows thrice daily.

Thomas Steele explaining his farming system to the members of the European Cattle Innovation Partnership

The management of pregnant cattle has implications for the performance, health and welfare of their calves

This is the first of a series of "bite sized" articles which will be produced by our Global Research Officer – Gareth Arnott

Gareth Arnott (Queen's University Belfast) and Kenny Rutherford (SRUC, Edinburgh)

Cattle face a number of challenges that can affect their welfare and performance, including nutritional challenges, disease, housing conditions, social stressors associated with group living and mixing, quality of handling, and environmental challenges. It is now becoming apparent that conditions experienced before birth (the prenatal period) also have important lifelong consequences. In other words, the challenges highlighted above not only influence the welfare of cows (beef and dairy) during pregnancy, but also have important consequences for the calves they are carrying.

Studies on pregnant cows have demonstrated a range of negative outcomes of prenatal stress for calves including; increased mortality and susceptibility to disease, impaired immunity, reduced birth weight and growth, negative impacts on thermoregulation and stress physiology, and behavioural changes.

Research is currently investigating the importance of prenatal stressors in farm animals. Below we summarise the main findings resulting from a review of studies (conducted by Arnott and colleagues) examining prenatal stress in cattle (full review published in Journal of Animal Science, 2012, vol 90, 5021-5034). Pregnant cattle experience many potentially stressful management practices. For example, animals might be subjected to social stress (e.g. bullying) by being kept in groups of inappropriate size or composition, being subjected to regular or intermittent mixing with unfamiliar individuals, or experiencing competition for limited resources (e.g. a dry lying area or access to feed). The standard of housing could also directly affect maternal welfare with consequences for their offspring. Feeding systems that create periods of hunger or competition for feed could also provide a very important source of stress.

Common husbandry practices such as handling, restraint and transportation are stressful for cattle. Subjecting pregnant cattle to such stressors can have implications for the offspring, including a heightened stress response (making them more sensitive and reactive to day to day events).

Consideration should be given to the quality of handling facilities, with the aim of minimising stress. For beef cows in particular, a further source of stress is weaning, which is known to be distressing for several days following separation. Furthermore, around a third of UK beef farmers feed restrict cows in the few days following weaning, and this may exacerbate the stress experienced. Methods of weaning that minimise cow stress may have benefits for developing fetal calves, as well as for the cow and weaned calf, although this remains to be researched.

A number of studies also highlighted the

importance of environmental conditions during pregnancy. For example, calves from beef cows exposed to winter weather conditions were lighter at birth than those from dams maintained in a thermoneutral environment (with both dam groups having been managed to maintain similar body condition). Studies also suggest that heat stress can adversely affect offspring, although this is unlikely to be an issue in the UK. Maternal health during pregnancy is also important, with disease in the dam during gestation having implications for the health, welfare and performance of her offspring. For example, failure to treat beef cattle for gastrointestinal nematodes and liver fluke during gestation resulted in decreased offspring birth and weaning weights. In dairy cows, calves from dams that experienced disease during gestation had a greater risk of developing respiratory disease than did calves born to healthy cows.

A difficult birth can also have negative effects on calves. Producers will be well aware of the negative health and production effects of dystocia on the dam but studies also find negative consequences for calves, including; increased mortality and susceptibility to disease, decreased transfer of passive immunity, and behavioural changes (e.g. longer to stand and suckle successfully).

Above we highlight the negative impacts of prenatal stress. However, it is perhaps more valuable to view the prenatal period in a positive light, providing an opportunity to support good calf development. Optimising the management of pregnant cows (e.g. good handling facilities, housing, nutrition, and health) will have production and welfare benefits for their calves.

The importance of the early postnatal period of life for calf rearing has long been recognised. Here we emphasise that producers should also view the prenatal period as an opportunity to support good calf development, the benefits of which will be reaped following birth.

In summary, whilst there are some uncertainties as to how the findings from experimental studies translate to real life commercial farming conditions, together with a lack of knowledge regarding the importance of the stage of gestation when the stress occurs, it is clear that the management of pregnant cows not only impacts on their health, welfare and performance but also that of the calves they are carrying.

It is worthwhile for farmers to take a moment and consider what aspects of their production system could be placing stress on their pregnant animals, with possible hidden outcomes, damaging health/welfare and farm production efficiency, in their offspring.

ULSTER EXPERTISE AT CANADIAN COW CONFERENCE

Research projects selected for support by Northern Ireland farmers were under debate at the 31st Western Canadian Dairy Seminar in Edmonton last month.

Dr Marijntje Speijers, AFBI, Hillsborough

Dutch born agricultural scientist Dr Marijntje Speijers of AFBI, Hillsborough was invited to speak on 'Treatment strategies for dealing with digital dermatitis in the UK.'

Dr Speijers then joined a panel of speakers comprising researchers from Universities in Calgary, Wisconsin and Montreal for a debate on digital dermatitis and lameness in dairy herds. Commenting Dr Speijers said taking part in the Canadian event was an excellent opportunity to learn from the work of other scientists and exchange ideas of practical benefit to NI farmers.

Through AgriSearch, the NI Agricultural Research and Development Council, farmers in the province selected lameness in both cattle and sheep for research and on farm trials conducted by Dr Speijers and team at AFBI.

The annual Western Canadian Dairy Seminar is attended by producers, advisors, researchers and industry suppliers from across Canada and the USA. Dr Speijers was one of only two agricultural scientists from the UK to address the four day conferences, which also had speakers from Norway, Denmark, Canada and the USA.

Published by:
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