Queen's University Belfast

Institute for Global Food Security

NEWSLETTER MAY 2015

WELCOME

Welcome to the sixth edition of our newsletter. It is key that we keep our stakeholders and collaborators at home and abroad aware of the efforts that are being directed towards the multiple issues of global food security. I would like to take this opportunity to thank all the contributors and the wider staff and student body of our Institute for delivering across so many important areas of research. Partnerships are very important to us and we welcome new opportunities to engage with researchers, institutions and companies locally, nationally and internationally. - Professor Chris Elliott

Pioneering Food Fortress project showcased for EU Commissioner

Pictured, from left to right, Dr Kevin Cooper (IGFS), Commissioner Phil Hogan (EC), Prof. Andy Meharg (IGFS), Prof. Aaron Maule (IGFS) and Pro Vice Chancellor Prof. James McElnay (QUB)

European Commissioner for Agriculture and Rural Development Phil Hogan recently met with representatives of the Northern Ireland food, animal feed and farming sectors to learn about the innovative work taking place throughout the supply chain, including an initiative driving new standards in quality control and ground-breaking developments in the area of agri-nutrition.

Devenish Nutrition hosted the event at Queen's University during the Commissioner's visit to the province (Friday 27 March 2015). Commissioner Hogan met partners, Devenish Nutrition, Moy Park, Northern Ireland Grain Trade Associaton (NIGTA) and the Institute for Global Food Security (IGFS), involved in ground-breaking work to assure the security of the feed-food supply chain (Food Fortress).

The Commissioner was also informed of major initiatives in the area of agri-nutrition to substantially contribute toward human health.

Speaking at the meeting with Commissioner Hogan at Queen's, Owen Brennan, Executive Chairman of Devenish Group said: "Alongside our partners at Moy Park and Queen's, we were delighted to have the opportunity to meet with Commissioner Hogan and share specific examples of the globally leading innovation taking place within the Northern Ireland food and farming supply chain, driven by a collaborative approach to raising standards and breaking new ground.

Professor Chris Elliott, Director of the Institute for Global Food Security said: "The Food Fortress project was considered one of the top priorities to support the entire NI agri food sector and we are now working with the processing sector to take the innovative risk management system further to protect the entire NI food chain. We look to forward to exciting new opportunities, partnering with industry to compete successfully on a global scale."

IGFS students meet Minister Arlene Foster at the NI Food and Drink Awards (2015)

Students, representing the undergraduate and postgraduate community at the Institute, joined Prof Chris Elliott as the guests of Mr Michael Bell (Executive Director, NI Food & Drink Association) at the NI Food and Drink Awards (2015). The prestigious event held to celebrate "innovation and excellence" across Northern Ireland's world-class food and drink sector took place on Friday 20 March 2015 at the Ramada Plaza Hotel, Shaw's Bridge, Belfast .

The NI Food and Drink Awards offer a platform to showcase and formally honour those involved from across the entire industry, from farm to fork. Representatives from major retailers, industry leaders and government officials attended the event. By all accounts the night was an outstanding success.

Prof Chris Elliott and students are pictured with Minister Arlene Foster (Department of Enterprise, Trade and Investment)

Delighted for an invitation to such a wonderful event **Anna Gillespie** (PhD student) said "It was clear the Northern Ireland food industry is competing at an international level with a focus on innovation, unique and top quality products. Along with the well-known names there are many more small and interesting companies than I had previously known about creating simple products with a twist. The event had an excitement and friendly rivalry about it which can only help continue the growth of the industry in NI. The fact that representatives from IGFS (Queen's), Loughry College and University of Ulster were also invited to this event shows their commitment to innovation, food security and safety. At the end of the evening I left feeling hopeful and proud of our food industry...and also stuffed - needless to say the food was amazing!"

In stating his enjoyment of the event, **Daniel McDowell** (PhD student) also acknowledged the networking opportunity this event provided. "Attending the Northern Ireland Food and Drink Awards 2015 was a great experience. It provided an opportunity to have a superb dinner with Professor Chris Elliott, my PhD colleagues and Queen's students with whom I had not previously had a chance to meet before. It was a great chance to listen to the work everyone is currently doing at IGFS, and talk about a broad range of issues. The awards hosted the most successful and innovative food companies operating in Northern Ireland today, and we were afforded the opportunity to talk with the people from this industry before and after the dinner. I was able to see first-hand that the Northern Ireland Food and Drinks sector is diverse and thriving, producing many exciting job opportunities."

Aoife McElroy (Undergraduate student) said "It was a great event, with amazing food- a delight to be a part of. It was heart warming and encouraging to see the range of small and large food businesses and the growing success of the food industry within NI"

Further information on the NI Food and Drink Awards (2015) is available from the organisers, **www.nifda.co.uk**

Students in attendance were;

Lorna O'Brien (PhD student)

Ukpai Eze (PhD student)

Anna Gillespie (PhD student)

Aoife McElroy (Undergrad student)

Christine Sloan (Undergrad student)

Emelia Adator (MSc student)

Christian Anumudu (MSc student)

Daniel McDowell (PhD student)

Rachel Clarke (PhD student)

Institute research informing local dairy farmers on the issues surrounding fully housed versus grazing based dairy production systems

Dr Gareth Arnott and Dr Niamh O'Connell, in collaboration with dairy scientist Dr Conrad Ferris at the Agri-Food and Biosciences Institute, Hillsborough, have just completed a project comparing the relative merits of fully housed versus grazing based dairy production systems.

Over recent years, the dairy industry has become more intensive and a number of farmers have moved to fully housed production systems in which the cows do not get access to outdoor grazing. Much of the information on the relative merits of housed versus grazing systems is based on anecdotal evidence or 'hear-say'. As a result, AgriSearch commissioned a review of scientific studies comparing these different dairy production systems.

Following the scientific review, the researchers have launched a booklet aimed at informing the dairy industry. The booklet spans a number of boundaries covering the topics of cow health and welfare, milk production, cow fertility, environmental impact and economics. This is particularly timely given dairy farmers are currently suffering the lowest milk prices in a number of years. In an increasingly globalised dairy industry milk price volatility is now a commercial reality. Many farmers are questioning their future and the booklet provides an evidence-based source of information that can be used to determine the best strategy for their situation.

A key outcome from the review has been to demonstrate that there are considerable benefits from incorporating grazing within milk production systems. As the majority of Northern Ireland farms currently adopt this approach, this could offer a future marketing opportunity. Northern Ireland milk has a clean, green, welfare-friendly image, and in the future this may offer scope for processors to pay a premium for milk produced by cows which have access to grazing.

The full booklet can be downloaded for free via the AgriSearch website at **http://www.agrisearch.org/publications/farmer-booklets/a-comparison-of-confinement-and-grazing-systems-for-dairy-cows-what-does-the-science-say.**

NI-based researchers in new BBSRC Animal Health Research Club (ARC) funded project

Professor Gordon Allan and Dr Mark Mooney from Queen's University Belfast in collaboration with Dr John McKillen (Agri-Food and Biosciences Institute) and Dr Michael Welsh (SiSaf Ltd) will work on a 3 year BBSRC Animal Health Research Club (ARC) funded (£1,049,594) research programme led by Professor Chris Secombes at the University of Aberdeen aimed at defining the gut regions in salmon responsible for recognising orally-delivered vaccines.

Entitled *"Development of novel oral vaccination strategies for Atlantic salmon"*, project co-investigators will include Professor Sandra Adams, Professor James Bron and Professor Randolph Richards from the University of Stirling and Dr Jun Zou from the University of Aberdeen.

Whilst Scotland is the largest producer of farmed Atlantic salmon within the EU and the third largest worldwide, infectious diseases are a significant factor affecting aquaculture economic stability. Injections of vaccines to individual fish are often used but this limits the vaccination window to the inland phase of salmon farming.

This project will create a detailed immune profile of infected and vaccinated fish to evaluate novel nanoparticle vaccine delivery technology and seek to develop improved oral vaccines for salmon.

For more information about ARC visit **www.bbsrc.ac.uk/business/collaborative-research/industry-clubs/animal-health/**

Dragons' den success for two IGFS microbiologists

The Institute for Global Food Security continually strives to deliver significant benefit/impact to society through its research. This is achieved through active engagement with many of the region's major agri-food businesses.

The need to deliver 'Impact', was one of the main drivers behind a new Institute initiative based on the 'Dragons' Den' BBC television programme.

Dr Irene Grant and Dr Linda Stewart were successful in the recent Institute Dragons' Den competition, which was open to everyone within IGFS. The two had 5 minutes to pitch details of their proposed research to a panel of seven Dragons (members of the IGFS Advisory Board) and describe the potential impact of the research for the local agri-food industry. Each was awarded £5000 by the panel and will have six months to complete their research.

Dr Grant will use her award to fund early stage development of a lateral flow device for detection of *Mycobacterium avium* subsp. *paratuberculosis* (MAP) in cattle faeces. The research will be carried out by her PhD student Lorna O'Brien in collaboration with Abingdon Health (formerly Forsite Diagnostics).

MAP is a bacterium that causes a chronic infectious gut disease in cattle, sheep and goats known as Johne's disease (JD). Infected animals can shed MAP in very high numbers in their faeces, and in milk in lower numbers. Northern Ireland, and the island of Ireland more generally, has a substantial JD problem in the national dairy herd (~40% herd prevalence). This has led to the recent setting up of a voluntary JD control programme by Animal Health Ireland and Animal Health and Welfare NI. Fundamental to any JD control programme is the ability to identify MAP infected animals so that they can be culled or isolated. The successful development of a MAP-specific LFD for testing cattle faeces would enable faster diagnosis of MAP infected animals than is currently possible using the 'gold standard' faecal culture method, which requires incubation periods of up to 16 weeks. Herd management decisions on the basis of LFD test results could happen faster, leading to more rapid decreases in JD herd prevalence than are currently being achieved, and ultimately improved health status of the national dairy herd.

Pictured, fromt left to right, Dr Linda Stewart and Dr Irene Grant

Dr Stewart will use her funding to characterise peptide mimotopes of *Mycobacterium bovis* surface antigens for serological diagnosis of bovine TB. Current diagnostic methods are not detecting all infected animals, which has led to a hiatus in terms of level of bTB control achievable in the national herd, so the search for novel, more appropriate biomarkers on *M. bovis* cells is more urgent than ever. The *M. bovis* cell envelope plays a critical role in bTB pathogenesis. It is the first point of contact with the host immune system and contains a range of potential diagnostic targets. During the course of recent projects a panel of binders to a pathogenic strain of *M. bovis* was produced, and several of these binders were successfully incorporated into novel assays for *M. bovis* detection (immunomagnetic separation and *RAPID***bTB** lateral flow device).

Characterisation of the cell surface binding sites of three of these binders by immunofluorescent microscopy and reverse phage display biopanning has generated a panel of peptide sequences which correspond to *M. bovis* cell surface components when blasted against online databases.

These represent candidate *M. bovis* surface epitope mimic (mimotope) peptides which may have the potential to form the basis of a novel ante-mortem blood-based antibody assay to determine the bTB disease status of live animals and to ultimately replace the existing TB cattle skin test. In addition, if any of the peptides, or cocktails of peptides, are shown to be immunogenic they could indicate targets that could be exploited for vaccine induced immunity or form the basis of a test that could differentiate between infected and vaccinated animals.

These possibilities will be explored during the Dragons' Den project.

STARTEC: Decision Support Tools to ensure safe, tasty and nutritious Advanced Ready-To-Eat foods for healthy and vulnerable Consumers

Food business operators must make daily decisions about food safety and quality, often based on limited scientific data, or full knowledge of the consequences of deviations for the consumer, due to the limited capacity to carry out analyses and risk assessments. The purpose of the project has been to develop an IT tool and guidelines based on scientific evidence and predictive models to enable food operators to estimate the quality and safety level in their products (ready-to-eat foods) if alternative ingredients, process and storage conditions are applied. This three-year project, FP7 EU funded and coordinated by Tara Skjerdal (Norwegian Veterinary Institute), successfully completed on the 31st January 2015. Queen's University Belfast was one of the eight participants in the consortium with two work packages leader roles (Dr Koidis and Dr Boeri), one focused on novel preservation technologies (carried out at the Institute for Global Food Security) and the other on cost and preference

STARTEC Consortium in Barcelona for the final project meeting (January 2015)

analyses (carried out at the Department of Ecology, Evolution Behaviour and Environmental Economics, MBC). Our work package partially or fully supported two PhD students and two postdocs positions; in terms of knowledge transfer and dissemination activities we have generated five publications in peer reviewed journals, five conference presentations and a close industry collaboration with industry partners in Ireland, Italy and Norway.

Dr Tassos Koidis (PI), Dr Marco Boeri, Dr Gonzalo Delgado-Pando and Mr Alexandros Stratakos

More evidence that milk Proteins are beneficial!

Anna Gillespie's PhD project (supervised by Dr Brian Green and funded by DARD) is investigating whether whey proteins have actions that might guard against the development of type 2 diabetes. Anna has recently published some of her exciting findings in the esteemed journal *Food Chemistry*. The research article is the first investigation to assess the anti-diabetic effects of cheese and yogurt whey on highly specialised gut cells which produce 'incretin' hormones.

Dr Brian Green said "The incretin hormone system is located in our intestine and has lots of beneficial effects on the body. This system is the basis for a number of approved anti-diabetic therapies. What Anna has shown here is that there is potential to improve the capacity of this system by means of specific dietary proteins."

Anna Gillespie said "We found that whey proteins are highly beneficial for enteroendocrine cells, and they are most beneficial to these important gut cells when they are not digested by the stomach. The next step will be to assess whether we can maximize their effects by somehow protecting or encapsulating them." Anna was an invited speaker at the 7th International Whey Conference in Rotterdam in September 2014

The article can be found at **http://www.sciencedirect.com/science/article/pii/S0308814615001922**

Unreported shellfish trade threatens security of the European oyster industry

The presence of human gut pathogens or harmful toxins in shellfish has been a major concern in the seafood industry for many decades [1,2]. The oyster industry is no exception. The cupped oyster *Crassostrea gigas*, originating from East Asia and cultivated all over the world, is currently the most important European shellfish production in terms of total value [3] and its commercialization is regularly challenged by sanitary issues. However, over the last years, stocks of this species have been facing a more important threat, in the form of a herpes virus (non transmissible to humans), that has been devastating a quarter of France's oyster production since 2008, and has been killing 10 million oysters in Australia in just three days [4]. The virus OsHV-1 ("ostreid herpesvirus") has been sporadically recorded during the last 20 years, mostly in French oyster hatcheries. However, the current mortality outbreaks are associated with an emergent form of this virus, called OsHV-1 µVar (for "microvariant").

A new study performed at QUB/IGFS [5] has demonstrated, through a compilation and re-analysis of previously published data, that the origin of the viruses (OsHV-1 and OsHV-1 µVar) is in East Asia, the native region of *Crassostrea gigas*, where wild and healthy stocks of oysters are hosting a large variety of herpesvirus genotypes. The authors highlight the fact that the recent emergence of pathogenic forms is more likely to be due to an increased susceptibility of "domestic" strains of oysters (e.g., as a consequence of the development of hatcheries and production of triploids), rather than mutations occurring in ostreid herpesvirus. Indeed, DNA viruses (e.g. herpes viruses) have much slower mutation rates than RNA viruses (e.g. flu viruses).

Stocks of *Crassostrea gigas* used by the European shellfish industry originate from East Asia (mostly Japan), although imports from this native area have been banned since the 1970s. Stock transfers are now mostly restricted within European countries by EU regulations[6], and imports from East Asia are not any longer happening...at least officially!

The recent appearance of the OsHV-1 µVar highly suggests recent occurrences of non-declared imports from East Asia that may have spread the disease into Europe, threatening the security and sustainability of this industry. This hypothesis is backed up by another study at QUB/IGFS [7] that uses the appearance of Northwestern Pacific species of seaweeds and invertebrates in Europe (brought as 'hitchhikers' on oyster shells) as "forensic" evidence of those imports.

Both studies highlight loopholes in the present regulations (e.g. allowing imports of live shellfish from East Asia for direct food consumption [8]). Such imports can easily be undertaken by independent oyster farmers who would like to improve diversity, and therefore resistance of their oyster stock. Such practices compromise biosecurity, both towards the shellfish industry (by bringing new diseases) and the marine coastal ecosystems (by bringing invasive species). The research also highlights the utility of using a phylogenetic approach in a forensic manner to track the spread of a viral disease threatening the future and sustainability of an important agricultural sector. As such, there is wide scope to use the approach to track the spread of other disease threats in a globalised food supply chain.

[1]Schaeffer et al. 2013. International Journal of Food Microbiology 166: 244-248 (doi: 10.1016/j.ijfoodmicro.2013.07.022)

[2] Hinder et al. 2011. Environmental Health 10: 54 (doi: 10.1186/1476-069X-10-54)

[3] http://www.fao.org/fishery/statistics/global-aquaculture-production/en

[4] http://www.bloomberg.com/news/articles/2014-12-14/oyster-herpes-killer-virus-threatens-4-billion-industry

[5] Mineur F., Provan J., Arnott G. 2015. Phylogeographical analyses of shellfish viruses: inferring a geographical origin for ostreid herpesviruses OsHV-1(Malacoherpesviridae). Marine Biology 162: 181-192 (doi: 10.1007/s00227-014-2566-8)

[6] Council Directive 2006/88/EC (http://ec.europa.eu/food/animal/liveanimals/aquaculture/market_imports_en.htm)

[7] Mineur F., Le Roux A., Maggs C.A., Verlaque M. 2014. Positive feedback loop between introductions of non-native marine species and cultivation of oysters in Europe. Conservation Biology 28: 1667-1676.

[8] Directorate General for Health and Consumer Protection. (http://ec.europa.eu/food/food/biosafety/establishments/third_country/new_estab_lists_en.htm)

Can people in Northern Ireland adopt a Mediterranean diet to improve their vascular health?

Eating a Mediterranean diet (high in fruit, vegetables, nuts, wholegrains, fish and olive oil) is proven to significantly reduce the risk of developing cardiovascular disease (CVD) but often requires intensive support strategies to help people to change their diet. A major challenge for public health scientists is to find innovative and sustainable ways to help people choose a healthier diet, such as the Mediterranean diet.

Professor Woodside's research team in the Centre for Public Health have developed a culturally tailored peer support intervention to encourage adoption of a Mediterranean diet. The intervention is delivered by trained lay peers and is being tested in 75 overweight adults at high risk of developing CVD in a randomised controlled trial (TEAM-MED) funded by the National Preventive Research Initiative (MRC/NPRI). More recently, the research team, led by Professor Woodside, received a funding award by Northern Ireland Chest, Heart & Stroke to extend evaluation of the peer support intervention to already established community groups around Northern Ireland. The results of both studies will inform development of a future trial where the efficacy and cost-effectiveness of the peer support intervention will be tested.

Institute for Global Food Security welcomes Minister Stephen Farry

Minister Stephen Farry received a warm welcome to Queen's University Belfast on Thursday 26 March as invited keynote speaker at the Danske Bank Export First 'Meet the Minister' event held at the University.

The event was developed by the NI Chamber of Commerce and Industry in partnership with Danske Bank and supported by airline partner Etihad Airways. The programme aims to encourage export activity in Northern Ireland by sharing knowledge and expertise of some of the province's most successful exporters.

The event gave companies an opportunity to find out more about support for the business community in export markets, together with the opportunity to network with other export focused companies. Prof Sean Gorman (Dean, Medicine, Health & Life Sciences) spoke of the contribution of the University to the local business community, providing a wealth of exceptional talent for industry. Focusing on the showcased exporter, Devenish Nutrition, and the relationship with Queen's, he emphasised the world-leading research being conducted at the Institute for Global Food Security (IGFS) to support the agri-food industry.

Acknowledging that a skilled workforce is vital for economic growth, the Minister spoke of the investment by the Department of Employment and Learning, outlining the range of initiatives and programmes available to help address identified needs.

Mr Owen Brennan, Devenish Group, talked about the success of Devenish Nutrition, an agri-food company competing successfully internationally. Owen has overseen substantial growth of the company, both locally and overseas. He drew on his own experience within the agri-food sector and that of Devenish and spoke of the value of the successful partnerships across the sector. In referring to the contribution of the Institute at Queen's, Owen put great emphasis on the need for intensive research & development and innovation to enable organisations to stay ahead of competition. Product integrity, exceptional quality, were seen as key to success. Devenish Nutrition currently employs a member of staff at Queen's working in the area of quality control.

Pictured, from left to right, Dr Michalina Oplatowska-Stachowiak (IGFS), Mr Owen Brennan (Devenish), Dr Stephen Farry MLA, Mr Kevin Kingston (NICCI) and Ms Pamela Galvin-King (IGFS)

The audience were then invited to tour the facilities at the Institute for Global Food Security. They met with staff and students, and found out more about the leading-edge research being conducted at the Institute and it's practical application to the agri-food industry.

Minister Farry also visited the Advanced ASSET Laboratory. The Laboratory was established with support from equipment partners and also through funding from the European Regional Development Fund (ERDF), an Invest NI Programme.

IGFS paper featured in *The Conversation*

Climate change will have major effects on agricultural systems and the species that live on farmland. Lagomorphs (rabbits, hares, jackrabbits and the lesser known pikas) are particularly interesting as they are a major human food resource, valued game species, pests of agricultural significance, model laboratory animals and key elements in food webs, most notably those of agricultural grasslands.

A recent Institute for Global Food Security (IGFS) publication, authored by PhD student Katie Leach and Dr Neil Reid, Lecturer in Conservation Biology, in the open access scientific journal PLOS ONE, suggests that two-thirds of all lagomorph species will be impacted by projected climate change leading to dramatic shifts in their range and distribution by 2080. A quarter of lagomorphs are already listed as threatened, and 13 species are endangered or critically endangered with their future not looking too bright.

Of those that are common, including invasive and pest species such as the European rabbit or American cottontails, future shifts in their ranges are unlikely to threaten their populations but will certainly change the map in terms of their negative impacts on human agriculture altering their geographic impacts on crops. This could be good news for some farmers (such as those in Northern Australia where non-native invasive rabbits are predicted to decline and retract their range) and bad news for others (such as those in the north-western USA who may have up to five more species of cottontail rabbit to worry about as they invade new areas). **For more information click here**

Environmental Fingerprinting to Crack Food Crime

Food can be an excellent criminal currency, with fraudulently labelled or imitation products a soft "harmless" target. Combining this with fierce competition in the marketplace has resulted in fraud becoming the "cost of doing business", completely ignoring the fact that fraudulent traceability can actually compromise food safety. As the systems and processes used to monitor traceability have adapted and modified to provide the reassurance consumers are looking for, the sophistication and complexity of systems covering up the fraudulent activity have followed; this has driven a new evolution in analytical solutions, one of which is Stable Isotope Ratio Analysis (SIRA).

Pictured, from left to right, is Paul Jackson and Simon Johnson, laboratory technicians at Food Forensics.

SIRA is not new, but its application in surveillance and monitoring of food origin authenticity, is. Primary foods pick up an environmental fingerprint of where it has been produced – the isotopic signature from the water and nutrients are affected by the weather, microclimate, fertilisers, photosynthetic pathway etc. For example, tomatoes grown in fields in Spain have a completely different profile to those grown in UK glasshouses. By profiling the fingerprints of products from known origins, a reference population of authentic signatures is created. Unknown samples can then be tested for consistency with the reference samples.

Understanding and interpreting the variables affecting the individual isotopic variation requires a combination of chemistry, agronomy/agricultural/ production knowledge, nutrition and statistical skills. SIRA is used to highlight samples that are inconsistent with the profiles expected, these then require follow up investigations. With food fraud you are always looking for the "needle in the haystack". If you know where to look, the chances of finding what you are looking for dramatically increase, and, vitally, the one thing fraudsters (criminals) do not want is to get caught.

The deterrent impact of SIRA surveillance testing is dramatic.

SIRA is developing rapidly, not just across the EU but worldwide. Food Forensics have established a partnership SIRA laboratory with CTI in China to cover the Asian region to monitor the integrity of imports into China as well as developing reference datasets of Asian production.

This technique, as a developing application of existing scientific methods, has attracted attention from academics and commercial businesses alike. Food Forensics and Queens University Belfast have come together with 36 other pan-European organisations in an EU funded project, Food Integrity which is focused on rationalising and harmonising capabilities to assure food safety, authenticity and quality. SIRA is featuring prominently within this, starting with consortium members writing a scientific opinion on the use of SIRA evidence in legal cases and developing databases of reference materials and test solutions.

Unlike paper or computer based traceability, SIRA profiles cannot be created, changed or swopped. SIRA testing complements supply chain vulnerability assessments, enabling effective deterrence, detection and ultimately effective, defendable, due diligence.

An article by Alison Johnson, Managing Director, Food Forensics

Student and Staff News

As part of **Alexandros Stratakos**' PhD, an alternative strategy was developed to reduce the risk against *Listeria monocytogenes* in ready-to-eat meat products. This pathogen is the causative agent of listeriosis, a serious and often life threatening disease. This new strategy is based on the synergistic effect of high pressure processing and antimicrobial packaging. The results are presented in the following publication: *Synergism between high-pressure processing and active packaging against Listeria monocytogenes in ready-to-eat chicken breast* by Alexandros Ch. Stratakos, Gonzalo Delgado-Pando, Mark Linton, Margaret F. Patterson, Anastasios Koidis and published in Innovative Food Science and Emerging Technologies 27 (2015) 41–47.

Dr Kamela Alegre has been awarded the prestigious Royal Irish Academy Charlemont Award. Dr Alegre is a postdoctoral research assistant in Dr Christopher Law's laboratory in the School of Biological Sciences. She is currently working on BBSRC-funded research into the mechanism and three-dimensional structure of a membrane transporter protein involved in multidrug resistance in pathogenic bacteria.

The RIA Charlemont Award will enable Kamela to travel to Dr Simon Newstead's laboratory in Oxford University to pursue her structural studies using state-of-the-art robotics for setting up nanolitre crystallization trials of the protein with a view to solving its structure using X-ray crystallography. Kamela is the first scientist from Northern Ireland to receive this prestigious award and it is a reflection of the world-leading molecular science taking place at IGFS.

Dr Neil Reid, Lecturer in Conservation Biology, has secured a DEL studentship with matched funding from Operation Wallacea for **Hannah Hoskins** to study the vulnerability of endangered large mammals in the cloud forests of Honduras, Central America; focusing on the threat from deforestation for coffee, cardamom and narcotic cash crops as well as subsistence bushmeat hunting.

Pictured, Dr Kamela Alegre (right) receiving the award from RIA President Mary E. Daly in Academy House on Monday 16th February 2015.

Dr Tancredi Caruso and **Professor Mark Emmerson** have recently been awarded a NERC grant (£327,000) within the NERC Soil Security Programme.

The project is part of a consortium worth £1.4m including the University of Manchester (Prof. Richard Bardgett and Dr. Franciska de Vries) and the University of Aberdeen (Prof. Dave Johnson and Prof. Elizabeth Baggs) and will investigate the controls on the stability of soils and their functioning under land use and climate change.

The Soil Security Programme (SPP) is a five-year programme led by NERC with support from BBSRC, Scottish Government and Defra. The overarching aim of the programme is to deliver improved forecasts of the response of the soils system to changes in climate, vegetation or management at scales of analysis which match the scale of decision making.

The programme is linked to the joint NERC-BBSRC programme called GFS (Global Food Security) - SARISA (Soil and Rhizosphere Interations for Sustainable Agri-ecosystems).

So far three projects have been funded by SPP and four projects by GFS-SARISA: the kick-off meeting of the seven projects was held in the Organic Research Centre of the Elm Farm (Newbury, England) on 26 February 2015. The research activities will start in June 2015.

If you have an article, research announcement or staff/student news you would like to see featured in the next IGFS Newsletter then please email Michael Hills at **m.hills@qub.ac.uk**

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