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THE FOOD CHAIN

THE **safefood** KNOWLEDGE NETWORKS NEWSLETTERISSUE
No. 2

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TACCP HELPS IDENTIFY THREATS TO FOOD SAFETY

FOOD SAFETY professionals are all familiar with HACCP (Hazard Analysis & Critical Control Point), but what about TACCP (Threat Assessment Critical Control Point)?

"It's important to understand that there are criminals out there and real threats to our business," says Lynn Patterson of LP Associates, who specialises in food-safety training. "There are different types of people involved in food threats: the opportunistic, the extremist, the extortionist and the professional criminal, as food is a big opportunity for them."

"TACCP is a process that is very similar to HACCP. It has a familiar methodology but it involves looking at threats as opposed to hazards."

"TACCP would certainly help you show that you understand your supply chain and the threats to your business," says Lynn. "HACCP mainly involves quality, technical and production engineering, whereas TACCP brings in human resources, security and purchasing because it looks at the supply chain, the site and the production facility."

**"IT'S
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The supply chain in the food industry is complex so there is plenty of opportunity for food fraud. The horsemeat adulteration scandal in 2013 brought this type of crime to the attention of not only food processors and the retail industry, but also the public.

"Authorities are trying to tackle food crime and they want the

industry to self-regulate", says Lynn. "This is a great opportunity for us to take on this new methodology and actually look at our supply chain and process."

Products known to be prone to threats, such as mislabelling, include olive oil, basmati rice and manuka honey (which is sold at a high price for its health benefits). Fraud in the fish industry is also common, as was shown in a 2013 Oceana study, which reported that a third of the fish tested in retail outlets in the United States was mislabelled.

Food security is not completely new to companies. Those with



LYNN
PATTERSON

the British Retail Consortium Global Standard for Food Safety already have detailed knowledge of their supply base. The newest version of this standard was released at the start of January. It focuses on encouraging companies to put systems in place to reduce their exposure to fraud. It also seeks to foster greater transparency and traceability in the supply chain.

She adds that the Global Food Safety Initiative, an industry-driven global collaborative platform to advance food safety, talks about an umbrella of food safety. It has three pillars: HACCP, TACCP and VACCP, which is vulnerability assessment.



NEWS

M&S CAMPYLOBACTER CHALLENGE

MARKS & SPENCER is introducing a five-point *Campylobacter* reduction plan across its UK stores. The plan consists of: zero thinning or flock-culling during the growing cycle; rapid surface chilling; front-of-pack labelling; double-bagging chickens; and a farmer bonus scheme for *Campylobacter*-free farms. Read more on the Food Standards Agency website: food.gov.uk

43RD ANNUAL FOOD RESEARCH CONFERENCE

THIS CONFERENCE, which was hosted by **safefood** and University College Dublin, was held in December 2014 at UCD. The keynote speakers were: Prof Colin Hill of University College Cork; Prof Dolores O'Riordan, Director of the Institute of Food and Health at University College Dublin; Dr Mark Fenelon, Head of the Food Chemistry & Technology Department at Teagasc; and Dr Alyson Hill, a lecturer in Human Nutrition and Dietetics at Ulster University. As ever, the conference gave young food researchers a chance to present their work. The conference also included a careers workshop that gave students advice and guidance on careers in the agri-food sector.



Student delegates attending the Food Research Conference

OPPORTUNITIES

SAFEFOOD TRAINING & MOBILITY PROGRAMME 2015

ENHANCE YOUR SKILLS and broaden your expertise by spending time working with another organisation. Collaborate and connect with other food safety professionals on the island of Ireland and overseas. Past participants have attended conferences and courses, and visited labs, across the island, UK, US and Australia. Knowledge Networks members can apply for a bursary of up to €1,200 (or Sterling equivalent) through the programme. See safefood.ning.com.

FREE FOOD CHAIN SECURITY COURSE

PROF CHRIS ELLIOTT of Queen's University Belfast will soon re-run his free online training course. The two-part MOOC (massive open online course) will run for two hours a week over two periods of four weeks each. It will focus on threats to global food security, supply chain integrity and the challenges of maintaining healthy and sustainable food supplies. Interested? Register on futurelearn.com.

WHAT IS A TYPICAL DAY AT WORK FOR YOU?

The boat operates 24 hours a day. The net is shot and hauled from the boat every five hours. Often when we haul, we don't necessarily get anything so we have to go to other fishing grounds.

Quotas mean that we have to keep moving around the coast. The quota for haddock could be so small that I could end up with that on one trip out, so we have to think one step ahead all the time.

WHY DID YOU BECOME A FISHERMAN?

There weren't a lot of opportunities in the north of Donegal in the 1970s. The only people making money were fishermen so I became one at the age of 17. I'm 35 years at it now.

HOW DID YOU BECOME A SKIPPER?

If you want to move ahead, you look at the man at the wheel and say to yourself that you wouldn't



A DAY IN THE LIFE

CARA RAWDON IS THE OWNER AND SKIPPER OF *THE CATHERINE R*, A 28-METRE FISHING TRAWLER BASED IN GREENCASTLE, CO DONEGAL.

WHAT KIND OF FISH DO YOU CATCH?

We go out for six or seven days at a time and hunt for what are called demersal species, which include whiting, haddock, cod and anything that swims along the bottom of the sea.

At sea we number each fish we catch, so when we land, people know how old it is and it doesn't get wrongly rotated.

HOW DO YOU SELL WHAT YOU CATCH?

I am part of the Foyle Fisherman's Co-op in Greencastle in Co Donegal, which 12 of us started 25 years ago when fish was becoming a difficult sale and there were gluts in the market.

Now, before we even land, the co-op manager has sold the fish all over Europe, especially to big buyers in France and Spain. We prepare and pack the fish in eight-kilo boxes and ship them to the buyers.

mind doing that. I bought my first boat for €30,000 at the age of 22 and have kept going ever since.

WHAT IS THE BIGGEST CHALLENGE OF YOUR WORK?

The paperwork! The rest is second nature. It becomes almost overpowering at times keeping track of everything. There are lots of checks to ensure everything is in order and the penalties for getting it wrong are huge.

Control and enforcement rules are strict. I must inform the Sea Fisheries Protection Agency each time I leave the port and must have an activity report outlining what I'm going to be doing. Then, each night I must report exactly what fish I've caught and where I've caught them.

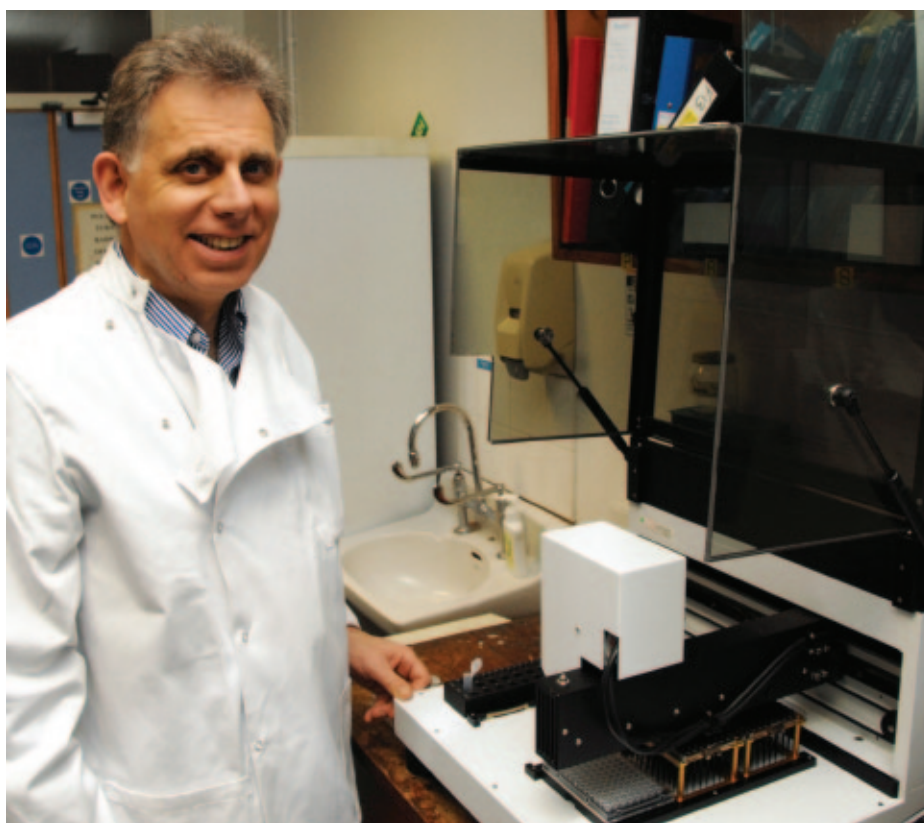
To learn more about those working in fishing, visit the websites of the Federation of Irish Fishermen (fif.ie) and the Anglo North Irish Fish Producers' Organisation (anifpo.com).

MY RESEARCH

MALCOLM TAYLOR, AFBI

MALCOLM IS THE FOOD HYGIENE UNIT PROJECT LEADER IN THE FOOD SCIENCE BRANCH OF THE SUSTAINABLE AGRI-FOOD SCIENCES DIVISION (SAFSD), AGRI-FOOD AND BIOSCIENCES INSTITUTE (AFBI), BELFAST

"MOLECULAR BIOLOGY HAS BEEN AVAILABLE AS A TOOL FOR MICROBIOLOGISTS AND RESEARCHERS FOR MORE THAN 20 YEARS, BUT ITS ADOPTION BY LABS WAS LIMITED IN THE PAST"



AS A PROJECT LEADER, I'm involved in several areas of commercial research and testing, as well as government and publicly-funded research, primarily with the red and white meat sector. We provide molecular diagnostic testing as well as molecular research in the area of food microbiology.

Molecular biology has been available as a tool for microbiologists and researchers for more than 20 years, but its adoption by laboratories was limited in the past for various reasons. However, such analysis can now be undertaken at comparable costs to traditional culture.

One of the limiting factors of molecular diagnostics has been cost and the number of samples one can deal with. In the past, robotics equipment was more expensive (£100,000 per robot), but now you can get units for £20,000.

The adoption of automated liquid-handling systems means that we can process several hundred samples a day, whereas in the past one operator could only do 50 samples. This has led to significant cost reductions and more rapid notification of results.

RAPID ON-FARM TESTING FOR *CAMPYLOBACTER*

One example of our work was a response to a research call from the Food Standards Agency (FSA), to evaluate assays that could be used to detect *Campylobacter* on the farm.

Our laboratory was successful in being awarded a £360,000 project for the development of a rapid on-farm test for *Campylobacter* in broilers.

After looking at a number of different approaches, we came to the conclusion that instead of doing an on-farm test, it was more effective if a sample was collected by the farmer and sent in the post to a central lab where it was processed.

In brief, this method involves a farmer putting on a sampling sock over his wellington boot. He then walks up and down the poultry house. The sock is then put into a sealed bag inside a stamped, addressed, tear-proof envelope and sent for analysis. A report of the results is sent directly to the farmer's phone by text.

This solution means that samples can be collected and results can be reported within 24 hours, if not sooner. Handling specimens at a central laboratory also ensures consistent quality control, which can be a problem with on-farm tests.

TESTING SCHEME FOR INDEPENDENT FARMERS

We're currently working with the FSA and the National Farmers Union (NFU) across the UK on a *Campylobacter* testing scheme for independent farmers. Around 20 per cent of the UK broiler industry is independent. One of the things I'd like to do is roll this scheme out to the Republic of Ireland broiler industry.

Under this scheme, free testing is being offered to farmers who register online at www.act-nfu.org and input information anonymously into a national database.

Farmers can benchmark their performance against national baselines and a statistical analysis will identify *Campylobacter*-reducing trends.

REAL BENEFITS FROM THE SAFEFOOD TRAINING & MOBILITY PROGRAMME

KEVIN HUNT is a Microbiology Analyst at the Marine Institute in Galway. He is also undertaking a research Masters at University College Dublin, investigating how the risk of viral contamination is assessed in commercial shellfish.

The **safefood** Training & Mobility Programme funded him to attend a four-day workshop on predictive modelling in food microbiology at the Polytechnic Institute of Braganca in Portugal in September 2014.

The workshop's aim was to show how mathematical models are used to predict the reaction of food-related pathogens to changes in the environment, something Kevin found highly relevant.

"These models could describe how bacteria or other micro-organisms respond to different stimuli and different conditions within food, which is crucial to understanding the risk of contamination," he said.

"They were teaching a set of tools or methods with a wide variety of applications. They are quite powerful once you know what you're doing with them. That's exactly why I went to the workshop – to find out how to use them."

The workshop involved theoretical lectures and practical sessions that tackled real implementations

of the theory, using the statistical language R. It also included lectures by Dr Vijay Juneja, a lead scientist with the US Department of Agriculture, on how these models are used in everyday agriculture and food science.

The notes and problem sets provided were comprehensive, said Kevin, and what he learned while in Portugal will prove useful to the Marine Institute in keeping up with advances in microbiological risk assessment.



KEVIN HUNT

It has also helped his own research and should bring him closer to publication of data, he says. He also expects to stay in touch with the academic instructors.

Kevin also found it beneficial to meet people from other disciplines.

"There was a wide range of people present from multinational manufacturing companies or food companies and from other academic backgrounds. It was nice to be able to talk to people about the questions I was trying to answer in my own research."

"I found the Training & Mobility Programme very useful and the application process straightforward. It was a very positive experience I would absolutely recommend to other people."

Learn more about the Training & Mobility programme at <http://safefood.ning.com/page/training-and-mobility>



Kevin (fourth from right) with fellow workshop participants at the Institute of Braganca, Portugal

RECENT CLIMATE CHANGE REPORT RAISES FOOD CONCERNS

A RECENT **safefood** report on climate change and food safety predicts that local ecosystem changes will result in changes in land use and, potentially, agricultural land abandonment in some places.

Climate Change Ireland: The potential impacts of climate change on food safety from an island of Ireland perspective provides the most comprehensive assessment yet of the potential impacts from an island of Ireland perspective, said Dr James McIntosh, a Toxicologist with **safefood**. He added that climate change could cause significant disruption to this economy.

The Institute for Global Food Security at Queen's University Belfast (QUB) conducted research for the report. It took into account the findings of a whole range of models for predicting climate fluctuations and for risk assessment of specific food safety hazards.

Climate change could cause major local upsets by affecting all aspects of the ecosystems in an area, says James. "Since all agricultural production is ultimately plant-based, it will be influenced by these changes."

One of the report's main concerns was the potential increase in pests and invasive species, and it recommended a stepping up of biosecurity.

"Biosecurity is any measure that is taken to prevent the introduction of diseases or disease-

causing organisms," says James. "Everyone along the food chain must play their part in making sure current and emerging threats to food safety are monitored and detected in time."



JAMES McINTOSH

Toxin accumulation in both plants and animals could also become a problem in aquaculture. "Researchers are developing systems that will permit continuous monitoring of the aquatic physical environment and the concentrations of phytoplankton species present," he says.

This data will be combined with surveillance data on harmful phytoplankton blooms and enable the development of predictive models. Aquaculture managers can respond rapidly if the risk of toxin contamination of shellfish is high, thereby preventing contaminated product from entering the food chain.

Dr Jack Lennon from QUB worked on the report. He says scientists and policymakers must work together to identify and deal with potential problems in advance and avoid the need for much more expensive firefighting.

"There is an urgent need to establish a coherent body of expertise for evidence-based food security threat assessment, focusing on climate and environmental change both within and across political boundaries," he said.

The full report is available online from safefood.eu/Publications/Research-Reports.

OWEN'S LIFE AND LIKES

LIVES: County Meath, three miles from Slane, which Owen says is a beautiful part of Ireland

HOBBIES: Fishing, shooting, hunting and any horse-related sports

PETS: Eight dogs

FAVORITE TYPE OF BOOK: History. Owen is currently reading about Napoleon

FAVORITE MUSIC: A wide range from Handel's Messiah to Johnny Cash

INTERESTING FACT: Owen plans to do a sponsored trek in Southern Ethiopia next November, to raise funds for Farm Africa, a charity that works on community projects from aquaculture to environmental renewal. Separately, Devenish has a partnership with Farm Africa to help farmers in Uganda establish pig production enterprises.



“AGRICULTURE AND FOOD IS A PRETTY GOOD PLACE TO BE”

WHEN IT COMES TO tackling issues in the food industry, Owen Brennan cuts quickly to the chase: from farmer to consumer, we need to stop looking at food as a commodity and instead see it as a source of nutrition.

“The words food and commodity don’t fit together,” says Owen, a co-founder of Belfast-based agri-tech business and animal feed manufacturer Devenish Nutrition. The company produces products for pigs, poultry, cattle, sheep, horses and companion animals.

“Food is elemental. It is at the level of water and fresh air. While I am very much for affordability, if we go down the ‘cheapest price’ route, it leads us into all sorts of problems with sustainability.”

Growing up on the family farm in Carlow, Owen developed an interest in food production, and he studied agriculture at the now-closed Warrenstown College in Co Meath and University College Dublin before working as a nutritionist.

In 1997, Owen and two colleagues bought Devenish. Since then, the company has expanded to include manufacturing sites in the Northern Ireland, Britain and the US, and has established a presence in the Middle East.

“Agriculture and food is a pretty good place to be,” says Owen. “Anything that preoccupies people at least three times a day, 365 days a year, would strike you as being something of real significance.”

However, he stresses that the abiding notion of food being cheap and plentiful needs to be challenged, particularly in light of global population growth and dwindling resources. And even in economically challenging times, food quality and respect for the environment should be non-negotiable.

“Nutrition and health are not demarcated, separate issues, they are a continuum,” says Owen. “There’s a lot of noise out there about cost, but you can choose to buy good food very affordably.”

A former president of the Northern Ireland Grain Trade Association and a former chairman of the Livestock and Meat Commission, Owen praises the work done by these and other organisations through education programmes directed not just at schools and the community, but also at farmers and suppliers.

“We have been highlighting to people they are not in the farming

A WIDER VIEW OF FOOD PRODUCTION

ACROSS THE FOOD CHAIN, FROM FARM TO CONSUMER, WE NEED TO SEE THE BIGGER PICTURE TO ENSURE FOOD IS BOTH NUTRITIOUS AND SAFE, ACCORDING TO **OWEN BRENNAN**, EXECUTIVE CHAIRMAN OF THE DEVENISH GROUP.

business, they are in the food business,” he says.

Seeing the value of food as a source of nutrition – with cost as just one

element of that value – could help everyone in the food chain to make the connection between food and health in a more meaningful way, according to Owen.

SCANDINAVIAN LESSONS ON CAMPYLOBACTER CONTROL

GIVEN THE HIGH levels of *Campylobacter* found in farmed poultry on the island of Ireland, what can we learn from other countries dealing with flock contamination?

The recent **safe food** Knowledge Network conference 'Campylobacter: The poultry control programmes in Norway, Sweden & Denmark', heard about control programmes in these countries. Those present heard insights into microbiological, hygiene and process criteria, and new technology to test for contamination on the broiler farm.

"There are an estimated 9.2 million cases of campylobacteriosis in the EU every year costing the European economy €2.4 billion," says conference chair Dr Declan Bolton, the facilitator for the **safe food** Campylobacter Knowledge Network. "The corresponding figures for the island of Ireland are about 100,000 cases and €26 million, but many consider this an underestimate."

The Republic of Ireland fares particularly poorly for poultry contamination, notes Declan, a Principal Research Officer at Teagasc. "The only comprehensive surveillance study undertaken to assess the prevalence of *Campylobacter* was conducted throughout Europe in 2008. The Republic of Ireland was bottom of the league table with 83.1 per cent of broiler batches and 98.3 per cent of carcasses contaminated. The figures for contamination in the UK, which includes Northern Ireland, were 75.3 per cent for broiler batches and 86.3 per cent for carcasses."

Any *Campylobacter* control strategy in broilers would need to actively engage key stakeholders, including media, the attendees heard.

It should also include farmer education and training, support for biosecurity infrastructure, audits, *Campylobacter* monitoring of every batch (and appropriate action based on that information), consumer education and smart use of packaging – possibly branding to acknowledge the work invested and to assure the consumer.

"Each of these activities will have to be considered from the economic, political and science point of view," Declan says.



L-R: Declan Bolton, Teagasc; Merete Hofshagen, Norwegian Veterinary Institute; Ingrid Hansson, National Veterinary Institute, Sweden; Marianne Sandberg, Danish Agriculture and Food Council

FOCUS ON WATER AT VTEC CONFERENCE



L-R: Evonne McCabe, Teagasc; Fiona Brennan, James Hutton Institute, Scotland; Geraldine Duffy, Teagasc; Anne Carroll, Dublin Public Health Laboratory

INTERNATIONAL AND LOCAL experts presented new research to 120 delegates at the **safe food** VTEC Network Annual Conference held in Blanchardstown, Dublin, recently.

"We focused on the role of the production environment and water in the transmission of VTEC," says Dr Geraldine Duffy, facilitator of the **safe food** VTEC Knowledge Network. Keynote speakers included Dr Eelco Franz (National Institute for Public Health and the Environment (RIVM), The Netherlands), Dr Fiona Brennan (James Hutton Institute, Scotland) and Dr Paul Hynds (FoodNet Canada, Centre for Foodborne, Environmental and Zoonotic Infectious Diseases, Canada).

Verocytotoxigenic *E. coli* (VTEC) are bacteria that carry verotoxin genes as well as other virulence-related genes. They can cause serious illness, including kidney failure.

Attendees heard some *E. coli* can persist for many years in soil. "We don't know if that type of *E. coli* would cause human illness," says Geraldine, who adds this interesting question needs more research.

VTEC in water was the hot topic of the afternoon session. "We have a very high rate of VTEC infection on the island of Ireland and the reasons behind that aren't fully clear," says Geraldine, who is the Head of Food Safety in the Teagasc Food Research Programme.

Private well supplies were linked to some outbreaks in recent years; many were

contaminated by animal faeces carrying the toxigenic *E. coli*.

The Regulations on Household Food Waste and Bio-waste, which came into effect in 2013 and mandate waste separation, are likely to result in increased production of biodegradable municipal waste and this was identified as a future trend in agri-food. Discussions concentrated on the potential of pathogen survival in both composted and anaerobically digested waste.

Geraldine explains: "If the composting or digestion procedures are properly carried out, the pathogens shouldn't survive, but there's always a risk of recontamination after they've been treated, while they're in storage and before they might be applied back to crops".

The delegates also discussed current issues such as the application of PCR-based ISO 13136. "There are ongoing issues in the application of PCR as a detection tool" says Geraldine.

A frequent problem occurs when there is a positive PCR result, but bacteria cannot be cultured, she says. It is then unclear whether the genes identified by PCR were all present in the same bacteria, meaning it may or may not be pathogenic.

Delegates left with a good overview of emerging opportunities, future trends and research solutions to address in the coming year.

VTEC Network members can see presentations from the conference on safefood.ning.com.

CAMPAIGN EMPOWERS CONSUMERS TO REDUCE *CAMPYLOBACTER* RISK

A RECENT **safefood** campaign successfully used social media and targeted marketing to encourage consumers not to wash raw poultry before cooking it.

Despite evidence that potentially harmful bacteria such as *Campylobacter* can 'hitchhike' on water droplets to contaminate nearby surfaces in the kitchen, **safefood** discovered that up to 66 per cent of people still wash raw chicken and poultry under the tap before cooking it, according to Dr Linda Gordon, Chief Specialist Food Science at **safefood**.

The 'Don't Wash Raw Chicken' campaign, which ran in late 2014, encouraged consumers to think about the 'splash zone' around their sink, and where those bacteria might land, invisible to the naked eye. "It might be a fruit bowl, washed dishes, baby's bottles or dummies or even the person's own clothes," said Linda.

Rather than washing the chicken and splashing the bugs, the campaign encouraged consumers to cook chicken thoroughly to kill off potentially harmful bacteria, and to handle leftovers safely.

As well as placing the messages at 197 purchase points, on 7,500 trolley handles and on numerous LCD screens and on outdoor advertising on the island of Ireland, the campaign also engaged consumers through social media.

It reached more than 825,000 people on Facebook and engaged with more than 10,000 Twitter users. Vox pops and short videos proved a particularly engaging element of the approach, according to Dr Aileen McGloin, Communication Manager: Digital and Health at **safefood**.

"We are very happy with how this campaign performed in terms of both reach and engagement, and are doing further research to see how it has changed attitudes and behaviours," she says

Linda notes that everyone in the food chain, from producers to consumers, has a role to play in controlling *Campylobacter*. "Research is ongoing to try and keep *Campylobacter* out of broiler houses, but contamination rates on poultry are high and it is not a problem that is going to be solved very quickly," she says. "So we need to give consumers the best advice to lower the risk of *Campylobacter* causing illness."



UPCOMING EVENTS

For full event listings, see safefood.ning.com/events.

Thermal Processing Training Course
University College Cork
April 15th-16th, 2015

Salmonella Knowledge Network Conference
DAFM Laboratories,
Backweston, Celbridge,
Co.Kildare
April 16th, 2015

The theme this year is supply chain management in the meat and dairy industry.

11th International Association for Food Protection (IAFP) European Symposium on Food Safety
Cardiff City Hall, Cardiff, Wales
April 20th-22nd, 2015

Professional Certificate in Strategic Food Security Planning
The International Centre for Parliamentary Studies,
London
April 27th-May 1st, 2015

Listeria Knowledge Network Conference
Food Research Centre,
Moorepark, Fermoy
May 20th, 2015
This year's theme is managing and communicating risks related to pathogens in food. Topics will include:

- Hazard identification
- Risk assessment and management
- Risk communication

12th International Congress on Engineering and Food (ICEF12)
Québec City, Canada
June 14th-18th, 2015

MUSHROOM STUDY FINDS NO *LISTERIA*

RECENT CHALLENGE STUDIES carried out by Monaghan Mushrooms and researchers in Teagasc Food Research Centre, Moorepark, indicate that *Listeria monocytogenes* does not grow on refrigerated, pre-packed whole mushrooms during the shelf-life period.

Traditionally, the bacterium has not been an issue for mushroom growers, but in early 2014 *L. monocytogenes* was detected on a mushroom sample from one producer. The number of *L. monocytogenes* was not determined, and a concern arose that growth would occur and the numbers would exceed the regulations during the shelf life of the mushrooms.

A previous study conducted at retail level by the Food Safety Authority of Ireland in 2006 showed that 99 per cent of mushrooms were free of *Listeria*. In the remaining 1 per cent, the levels were within regulations and therefore safe for consumers.

This raised the question as to whether mushrooms support the growth of *L. monocytogenes* under normal shelf-life conditions, to the extent that the pathogen could grow above the safe level, according to Dr Juan Valverde, Research and Development Manager for Monaghan Mushrooms.

The company decided to conduct studies on the growth of *L. monocytogenes* on whole mushrooms, and to use conditions specified in a European Union Reference Laboratory for *Listeria monocytogenes* Technical Guidance Document published in June 2014.

The study was a **safefood** mini project and funded by the **safefood** Knowledge Networks. It was carried out with Dr Kieran Jordan, the *Listeria* Knowledge Network facilitator, who works at Teagasc, Moorepark.

The results showed that refrigerated fresh whole closed cap prepackaged mushrooms (*Agaricus bisporus*) did not support the growth of *L. monocytogenes* under these test conditions.

"As a result, detection of *L. monocytogenes* on a mushroom sample is not sufficient as the numbers will not increase during the shelf-life," says Kieran.

"Instead it is necessary to determine the actual numbers and the relationship between these numbers and the regulatory limit."

The results were presented at the **safefood** *Listeria* Knowledge Network conferences in Dublin (September 2014) and Belfast (November 2014) by Dr Avelino Alvarez-Ordóñez (Teagasc) and Dr Juan Valverde.

Juan says the results were welcomed, as it shows that Monaghan Mushrooms produces a safe product, but he cautions against complacency. "We have set a standard, and now we have to keep up to it," he says.

Since the occurrence of *L. monocytogenes* on mushrooms in 2014, the mushroom industry has taken the issue seriously and embarked on a strategy to address the issue, notes Kieran.

That includes: creating awareness about *L. monocytogenes* in all parts of the mushroom production chain; challenge studies to determine the ability of *L. monocytogenes* to grow on mushrooms; a survey of the occurrence of *L. monocytogenes* at growing facilities; and supporting a research project under the Food Institutional Research Measure to look at novel methods for control of *L. monocytogenes* in mushroom-growing facilities.



GET INVOLVED WITH THE FOOD CHAIN

We'd love to hear from you. Would you like us to feature your research or industry sector? What else would you like us to cover in the world of food safety? Send your article ideas, feedback and suggestions to networks@safefood.eu or contact one of our facilitators.

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JOIN THE SAFEFOOD KNOWLEDGE NETWORKS!

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COMPETITION

Siobhán Pyper (right) was the Issue 1 competition winner. Siobhán, the Senior Paediatric Dietitian at the Midland Regional Hospital in Mullingar, was delighted with her prize – a luxury hamper of gourmet food from the Arcadia Delicatessen in Belfast.



To be in with a chance to win an Arcadia Deli hamper this time around, answer our trivia questions!

1. What are nopales?
2. What can be a flatiron, a hangar or a skirt?
3. What is the common ingredient in Sassolino, Raki and Xtabentún?

Send your answers to networks@safefood.eu before May 1st, 2015. Good luck!