

Science Community Focus

Raising and Harmonizing Standards in International Food Integrity

Imogen Foster, Fera IFSTL Manager

The Fera International Food Safety Training Laboratory (IFSTL) opened its doors to its first clients at the beginning of February 2013. Imogen Foster, Fera IFSTL Manager, provides an update on the year and gives us an insight into one or two other topical developments from the integrated approach to food integrity across The Food and Environment Research Agency (Fera).



Dr Sadat Nawaz, Senior Analytical Chemist at Fera, explains how to assess chromatographic data to ensure good quality

Improving Compliance

The training laboratory is the result of Fera's collaboration with analytical equipment manufacturer Waters® and is aimed at improving compliance with EU food import standards. A significant proportion of food safety incidents reported in the EU are due to imports, therefore ensuring the legal compliance and safety of imported food is vital for protecting consumers. The EU has recognised the value of improving food safety testing globally, so that risks can be identified and tackled at source. In the EU alone the value of exports and imports of foodstuffs today exceeds £690 billion (over 860 billion Euros).

The Fera IFSTL is one of a planned network of training laboratories instigated by Waters® with the first opened at the University of Maryland in 2011 – the JIFSAN-IFSTL. Waters' initial interest in food safety capacity building developed from numerous requests from customers asking for help and support in understanding the diverse standards that exist in regulated global food trade. Waters believes that the creation and support of a partner-based International Food Safety Training Laboratory network can have a real impact by expanding training capability and creating a platform for exchange of ideas and sharing best practice.

Based near York, Fera IFSTL primarily trains scientists from around the world concerned with exporting foods to Europe from outside of the EU. Experienced scientists from Fera's food quality and safety programme lead the intensive, hands-on training courses and teach best practice methods using state-of-the-art technology and equipment, drawing on Fera's 100-year history in the application of analytical chemistry and molecular techniques to food safety testing. Subject areas range from pesticide and veterinary drug residue analysis to the testing of food contact materials, with topics covering sample preparation and extraction, practical LC-MS/MS and GC-MS methods and data processing. As Fera is also the UK National Reference Laboratory for chemical contaminants in food and animal feed, pesticide residues and veterinary drug residues, its scientists are well placed to advise

trainees on quality control and the interpretation of EU regulations. All this training is aimed at enabling food producing countries around the world to implement their own solutions and gain access to the opportunities offered by trade with Europe.

Since the day in February 2013 when the training laboratory opened its doors, ten training courses have been delivered, spanning a selection of some of the most critical and challenging international food contaminants issues. Trainees have attended from all over the world including South America, North America, Europe, South Africa, Malaysia, Indonesia, China, Saudi Arabia, India, Australia, New Zealand, Saudi Arabia and South Korea.

Key to IFSTL's success is the flexibility and customisation of course material and instruction to participants' needs; and the networking opportunities, knowledge-sharing, and new relationships forged, both between trainees and Fera specialists, and peer to peer amongst delegates, with overwhelmingly positive feedback.

One international course participant spent ten days in November with specialists from Fera's Pesticide and Veterinary Drugs teams;

"The Fera IFSTL has delivered a comprehensive, current and customisable training course providing a wealth of information and practical applications of the principles from many recognised technical experts. It has truly furthered international information sharing on residue issue," commented Susan, Australia.

"The training I received was invaluable. I had a lot of questions regarding pesticide analysis before attending the course. I am now more confident that I will be able to perform the analysis and produce accurate results very efficiently," said fellow course participant Estelle, South Africa.

Horizon Scanning

Training courses are often informed by emerging issues and Fera, in collaboration with Leatherhead Food Research, has established a global monitoring system for incidences



of food contamination called HorizonScan. This is currently the only tool available whereby food importers, processors, manufacturers and retailers can access a rapid overview of potential and emerging food safety issues. HorizonScan provides recall, alert and food safety information at a global level on a daily basis and categorises it in detail including commodity, exporting country, issue and risk. Reports from major food importing countries and others are all monitored.

Towards the end of 2013 the HorizonScan database received an increased number of reports of the mycotoxins aflatoxin and ochratoxin A in figs and nuts from various countries, with Turkish imports being particularly affected. Mycotoxins are a group of naturally occurring chemicals produced by certain moulds. They can grow on a variety of different crops and foodstuffs including cereals, nuts, spices, dried fruits, apple juice and coffee, often under warm and humid conditions. Findings on imported dried figs and nuts tend to increase in the run up to and during the Christmas period because more of them are traditionally consumed then.

Mycotoxin analysis is usually based on LC-MS and the method used varies depending on the mycotoxin of interest. The Fera IFSTL has developed practical basic and advanced training for methods routinely used in the EU for the analysis of mycotoxins in food.

HorizonScan has also reported recent increases in the number of reports of issues with foodborne viruses and this is a new area for which the Fera IFSTL is currently considering offering courses later in 2014. For example, Norovirus and hepatitis A can cause gastroenteritis and liver disease respectively. These viruses can be transmitted through contact with infected persons, and also through consumption of contaminated food. Foods like berries can become contaminated through being handled by infected persons, or through exposure to sewage-contaminated water used for irrigation. In recent years in Europe there have been large outbreaks of Norovirus gastroenteritis which have been attributed to eating contaminated berries. Another example is the Hepatitis E virus which can cause liver disease. It has recently been recognised that hepatitis E virus can be found in pigs, and it may contaminate pork products such as liver and sausage meat. In recent years there has been an increase in the numbers of cases of hepatitis E in the UK. Scientists at Fera use standardised methods to concentrate the virus particles before extracting their nucleic acids and using sophisticated analytical assays to identify the genetic sequences unique to each virus.

Proficiency Testing

A big part of each Fera IFSTL training course lies in explaining how scientists can demonstrate proficiency in their analytical methods for the benefit of their clients and customers. Proficiency testing is an essential part of laboratory quality procedure. Taking part in proficiency tests gives users confidence in their laboratory equipment, methods



David Sanderson from the Agri-Food and Biosciences Institute (AFBI) attends the first pesticide residues training course

and staff, and assurance that they are delivering the quality results demanded by their customers. Fera is home to the independently accredited FAPAS® proficiency testing scheme - the largest and most comprehensive analytical chemistry proficiency testing scheme in the food sector, with more than 4000 participants in over 100 countries. Each year FAPAS® publishes a programme of approx. 700 tests and laboratories from around the world can select which tests they wish to participate in. When the start date of a test approaches, FAPAS® sends out an identical sample to all laboratories involved, they test that sample and send the results back to FAPAS® scientists. The results from each individual lab are compared to the nominally correct value and in order to pass, a laboratory's result must be within a set tolerance from this correct value.

Specialists from FAPAS® provide Fera IFSTL trainees with an overview of PT and an outline of what PT schemes are available.

Again these schemes can be set up in response to food and feed contingencies. For example, when undeclared horsemeat was found in certain foodstuffs recently, FAPAS® was able to offer a scheme for the measurement of horsemeat in fresh and processed meat. A separate scheme for the detection of fish species was also established to support fish authenticity measurement claims when concerns about fish species labelling arose.

Looking Ahead

The Fera IFSTL aims to train food safety scientists from around the world on the best food safety practices in order that they can better detect food borne contamination and better understand what they have to do to meet EU regulatory standards. This training will, in turn, enable regulators, food producers and food processors to more easily detect and manage food contamination incidents anywhere in the production and supply chain and will increase compliance with food regulations.

The combination of skills available to the Fera IFSTL means that training in the detection and analysis of food contamination incidents is as comprehensive as it can be, enabling it to play a key role in ensuring that, ultimately, food safety and quality improves globally.

Details of Fera IFSTL training courses for 2014 can be found in the table below and on the website (www.ifstl.eu). New for 2014 is a special offer for bookings onto the forthcoming Fera IFSTL Mycotoxins in Foods and Advanced Mycotoxins training courses being held in March 2014. Candidates can benefit from a 10% discount when both courses booked together and each participant receives a complimentary FAPAS Proficiency Test and 3 months free subscription to HorizonScan.

IFSTL Training Course Details

Start date	Title	Length (days)
13-Jan-14	Materials & articles in contact with food	5
27-Jan-14	PAHs in foods	5
03-Feb-14	Veterinary drug residues in foods	10
03-Mar-14	Mycotoxins in foods	5
10-Mar-14	Advanced mycotoxins in foods	5
23-Apr-14	Pesticide residues in foods	8
12-May-14	LC-MS/MS analysis of residues and contaminants	5
02-Jun-14	Food virology	5
12-Jun-14	Managing the unknown in food safety (Risk Workshop)	2
18-Jun-14	Food microbiology for industry analysts	3
23-Jun-14	Methods of Identification for Salmonella & Campylobacter	3
26-Jun-14	Methods of Identification for Listeria	2
15-Sep-14	Stable Isotope Analysis for food authentication	5
06-Oct-14	Veterinary drug residues in food	10
17-Nov-14	Processing contaminants	5
08-Dec-14	Trace elements in food	3
19-Jan-15	PAHs in food	5
02-Feb-15	Multi-residue methods (pesticides and vet drugs) – advanced course	10



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