

Advancing beef safety through research and innovation

This issue is the third of a series of newsletters, which aim to update project partners and stakeholders on progress and key outputs from the ProSafeBeef project, together with news and events related to the European beef industry. Through research and innovation, ProSafeBeef aims to advance beef safety and quality across Europe. ProSafeBeef has now been running for two years, and will continue until 2012. The project involves 41 leading research and industrial organisations working in 18 different countries.

ProSafeBeef is a multi-disciplinary project; it involves researchers from a number of disciplines, including food safety, microbiology and risk assessment. A major strand of work within ProSafeBeef involves developing and applying quantitative risk assessment models to monitor, trace and reduce microbial and chemical contamination in the beef chain, and establishing novel control and intervention strategies for microbial pathogens at key points in the chain. This work will drive confidence in the safety of beef across Europe. ProSafeBeef's work on food safety is coordinated in Pillars 1 and 2 of the project.

To celebrate the progress and findings on beef safety to date, ProSafeBeef organised an international conference on "Advancing Beef Safety through Research and Innovation" which was held at Ashtown Food Research Conference Centre, Teagasc, Dublin, Ireland on 25th to 26th March 2009. This issue provides a full report from this successful conference, as well as an interview with Dr Geraldine Duffy, leader of Pillar 1.

Below: (from left to right) Mr Ian Jensen, Dr Geraldine Duffy, Dr John Luchansky and Dr Marta Hugas at the ProSafeBeef safety conference held in Dublin during March 2009



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ProSafeBeef international conference on beef safety

The *ProSafeBeef* project team are delighted with the success of their international conference *Advancing Beef Safety through Research and Innovation* held at Ashtown Food Research Centre, Teagasc, Dublin, Ireland on 25-26th March 2009. The conference attracted over 100 delegates from across Europe, including representatives from Austria, Belgium, Denmark, France, Italy, Norway, The Netherlands, the UK, Ireland, Serbia, Greece and Poland, and also from further afield, including delegates from Australia, Brazil, USA, Canada, Iran, and New Zealand.



Professor Gerry Boyle, the Director of Teagasc, and Mr Brendan Smith T.D., Irish Minister for Agriculture, Fisheries and Food

The conference brought a multi-disciplinary international team of researchers together with stakeholders from across the beef farm to fork chain to discuss the latest innovations in beef safety research, and to consider how these can be applied to improve beef safety. The control of microbial pathogens in meat requires an integrated total food chain approach which takes into account where and how microbial pathogens enter the beef chain and how they survive the various controls/interventions applied during production, processing and distribution, allowing them to reach the consumer. The beef chain must be treated as a continuous chain and controls are needed at key points along that chain which will collectively reduce microbial contamination and consumer exposure.

The topics addressed at the conference ranged from detection and tracking of microbial pathogens and chemical residues in the beef chain; development and application of quantitative risk assessment models to manage beef safety; development of novel and innovative approaches to control pathogens at key stages along the farm to fork beef chain as well as consumer attitudes and perception to beef safety. The conference showcased many of the latest findings from research conducted as part of the *ProSafeBeef* project, and provided a stimulating and lively forum for networking and debate.

The conference was formally opened by the Irish Minister for Agriculture, Fisheries and Food, Mr Brendan Smith T.D. The Minister highlighted that safety of the food supply is paramount not only for the consumer and to protect public health but also for the sustainability of the food industry. The beef sector in Europe is valued at €75 billion. It faces various challenges among which is the need to respond to an increasingly sophisticated, health-conscious consumer who requires the industry to produce beef and beef products that are convenient, traceable, nutritious and of consistent quality, and above all, safe. In particular, he highlighted the value of the beef industry to Ireland, which has an export value of some €1.7 billion with a stock of almost 6 million cattle.

By bringing together *ProSafeBeef* partners and representatives of so many countries to address global issues in

relation to food safety, this conference has played an important part in enhancing the beef industry in Europe. Mr Brendan Smith T.D also discussed the potential impact of a food scare linked to a particular commodity or brand. Concerns regarding the safety of beef could be catastrophic for any company implicated and indeed for the wider industry and the economy if consumer confidence and trust is lost. It is therefore in Europe's interest to be at the forefront in supplying safe, high quality and nutritious beef products.

The broad and stimulating programme allowed international experts to present their latest research findings on the control and management of microbial and chemical contaminants in beef. In total, the conference programme included presentations from 14 invited speakers, 14 selected short oral presentations and 42 poster presentations. Early presentations in the programme provided some context from European agencies. The first speaker, Dr Marta Hugas, presented perspectives on the microbial safety of beef from the European Food Safety Authority, and then Dr Kenneth Elliot presented the role of the EU Food and Veterinary Office in relation to chemical contaminants in meat. Other highlights of the day included a presentation by Mr Ian Jensen, of Meat and Livestock Australia, who discussed the challenges and opportunities for transfer of knowledge from research to the beef industry, a pertinent subject considering that the research innovations coming out of the *ProSafeBeef* project are critically important to the development of the European beef sector. Other highlights include findings coming out of research being done within the *ProSafeBeef* project such as the presentations on

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meat spoilage by Professor George Nychas (Agricultural University of Athens) and on spectroscopic imaging by Dr Mike Lee (University of Aberystwyth). Furthermore, a novel method to detect 38 different anti-parasitic drug residues in meat was presented at the conference. This new technology, which was developed by Dr Martin Danaher and colleagues at the Teagasc Food Research Centre, will now allow meat samples to be monitored for a wider range of anti-parasitic drug residues. The many research findings presented at the conference were put into

context by Professor Wim Verbeke, who described consumer perception of beef safety.

Organisers of the event were very pleased to be able to welcome several exhibitors to network and provide useful information to delegates; the event was attended by representatives from Biodetection systems BV, Technopath, Fisher Scientific and Roche. There was also some press interest in the event. An article in the Irish

Independent newspaper, published on the 31st March 2009, featured an interview with one of the speakers at the conference, Professor Wim Verbeke. The article focussed on findings on consumer attitudes to beef safety, which were presented at the conference.

The conference was supported by the European Commission, through its funding of the *ProSafeBeef* integrated project within the Framework Programme 6, and also the Food Safety Authority of Ireland.

Right: Following the address by the Irish Minister of Agriculture, Fisheries and Food Mr Brendan Smith T.D., delegates were also welcomed by *ProSafeBeef* coordinator, Mr Declan Troy, Professor Gerry Boyle, the Director of Teagasc and Dr Geraldine Duffy, Head of Food Safety at Ashtown Food Research Centre, Teagasc



An interview with Geraldine Duffy: Pillar 1 leader

Geraldine Duffy has been Head of the Food Safety Department at Teagasc, Ashtown Food Research Centre since 2005. Here, she talks about her work in the *ProSafeBeef* project.



Dr Geraldine Duffy

What is your background and how did this lead to your involvement in *ProSafeBeef*?

I hold a Bachelor of Science Degree from University College Dublin and obtained a PhD in Food Microbiology from the University of Ulster, Northern Ireland in 1994. Following some international post doctoral fellowships, I joined the research staff in Teagasc in 1996, and have been Head of the Food Safety Department since 2005. My research has focused on micro-organisms that can cause food borne illness, particularly the transmission and behaviour of microbial pathogens in the meat, farm to fork chain and on the development of safety

management systems including quantitative risk assessment models and novel interventions to control pathogens in meat and meat products. Since the start of my research career I have been involved in international research programmes and have co-ordinated projects under Framework IV and V on *E. coli* O157:H7 and *Cryptosporidium parvum*. *ProSafeBeef* has created an excellent opportunity for myself and international colleagues working in the area of beef safety to put together the Pillar 1 research programme on the development and application of quantitative risk assessment models to strategically manage microbial and chemical contaminants in the beef chain.

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As the leader of Pillar 1 in the ProSafeBeef project, what does your job involve?

My role as Pillar leader is to manage and direct the research in Pillar 1 which focuses on the development and application of quantitative risk assessment models to manage microbial and chemical contaminants in the beef chain. A key part of the role of pillar leader is to ensure that the research is progressing well and in accordance with the programme of work agreed with the Commission. I must also ensure that the latest developments in science, emerging issues in beef safety and indeed wider impacting socio-economic factors are incorporated and taken account of in the research programme.

How is this important in terms of the whole ProSafeBeef project?

As Pillar leader, I am also a member of the ProSafeBeef Governing board and I report to the Board on all activities in Pillar 1, and communicate the issues arising at Governing Board level to the partners in Pillar 1. The role of Pillar leader is key in the management structure and successful delivery of the ProSafeBeef project.

What other projects are you currently involved in?

I am currently involved in a number of projects at both national and international level. In the European Framework VI programme I am involved in a network on Pathogenic *E. coli* which is co-ordinated by my colleague, Dr Declan Bolton at Ashtown Food Research Centre and am about to start work on a new Framework VII project called *Baseline* which focuses on developing a range of new tools to improve risk assessment throughout the food and feed chains from "fork to farm".

On a national level I am involved in 8 projects funded by the Food Institutional Research Measure (FIRM) administered by the Irish Dept of Agriculture, Fisheries and Food. These include projects on the genomics of gram negative food pathogens, and the use of molecular tools to track microbial pathogens in the total food chain and assess their virulence potential for humans. I am also involved in projects on the development of Irish Quantitative risk assessment models for Verocytotoxigenic *E. coli* in Beef, *Salmonella* in pork and *Enterobacter sakazakii* (*Chronobacter*) in infant milk formula. I am also working on novel biocontrol agents such as bacteriophage and essential oil extracts which could be used to control VTEC shedding in cattle or in meat products. A recently commenced project will investigate the resistance of pathogenic bacteria in the food chain to anti-microbial agents and biocides.

What do you most enjoy about your involvement with ProSafeBeef? What has been your personal highlight from the project to date?

I particularly enjoy the international dimension, the diversity of the project and the opportunity that it allows for scientific development and for new collaborations with colleagues in many different disciplines. The cross disciplinary aspects to the project which link safety concerns with product and process, and innovation and consumer concerns, is a challenge but this approach has huge potential to really impact upon the beef industry. The highlight for me to date has been getting to know and build collaborations with colleagues in the project. At two years into the project we are now seeing the scientific endeavours delivering results.

ProSafeBeef has recently held a successful scientific conference on beef safety – what were the highlights of this for you? What did you learn from this event?

The recent international conference on beef safety in Dublin was a great opportunity to showcase the results which are being generated from the ProSafeBeef project. The conference provided an opportunity to see not only some of the developments that have already taken place within the project but also the current state of art with respect to beef safety. I was particularly delighted with the enthusiastic response and the level of attendance from the beef industry, the regulators and policy makers at the event. While this conference focused on beef safety it has shown there it is a real demand for such events and hopefully in 2010 an international conference focusing on innovations in beef products and processing will be organised by the ProSafeBeef project.

What plans do you have for the work of Pillar 1 for the remainder of the project?

In relation to chemical contaminants, we have been focusing on development of methods for detection of anti-parasitic drug residues agents in beef and we are now applying these methods to assess the levels of the drug residues in beef in Europe and South America. Over the remainder of the project this data, alongside other data on a wider range of veterinary drug and environmental residues, will be used to develop risk assessment models.

We have also been generating qualitative and quantitative data on key microbial pathogens in beef and of practices in the beef chain which impact on levels of pathogens. In the next phase we will be completing work on data collection and using molecular tools to characterise bacterial isolates

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recovered from the beef chain to assess their human virulence potential and their resistance to stresses and controls they encounter in the beef chain. This data will feed into quantitative microbial risk assessment models which can be used to manage risk and assess risk reductions from new interventions developed in Pillar 2.

How do you think the work of Pillar 1, as well as that of the whole project, will impact upon the beef industry?

It is expected that *ProSafeBeef* will enable the beef industry in Europe to deliver innovative, novel and improved fresh beef and beef products that are safe, high quality and consumer driven for national, regional and global markets, thus allowing for a more competitive and sustainable beef industry. The project will develop beef safety management systems, and will satisfy consumer demand for choice and both invigorate and add value to the beef chain by developing innovative beef processing techniques and innovative beef products that are safe, attractive to the customer and of high nutritional quality. By continuing to engage with SME's, expert collaborators from third countries and INCO partners with a vested interest in beef export, *ProSafeBeef* will ensure effective delivery of the project's technological and research outputs to end users and wider stakeholders throughout the beef industry.

The *ProSafeBeef* ICoMST workshop

The 55th International Congress of Meat Science and Technology is this year taking place in Denmark, Copenhagen, from 16-21st August. A *ProSafeBeef* satellite session will be held at this congress, on 'Advancing beef safety and quality through innovation'. The session will take place on the morning of Friday 21st August. Please find a draft programme for this event below. For further information on this event, please contact Robert Mooney (Robert.mooney@teagasc.ie).

ICOMST 2009, Copenhagen

Prosafebeef Symposium on August 21st, 2009, Copenhagen

Advancing beef safety and quality through research and innovation

9.00 am	Introduction to <i>Prosafebeef</i> Mr Declan Troy, Teagasc, Ashtown Food Research Centre, Ireland
Session 1: Emerging topics in beef safety	
9.15 am	Dr Geraldine Duffy, Head of Food Safety, Teagasc, Ashtown Food Research Centre, Ireland <i>Quantitative microbial risk assessments for beef pathogens</i>
10.05 am	Dr Martin Danaher, Teagasc, Ashtown Food Research Centre, Teagasc, Ireland <i>Novel methods for detection of chemical contaminants including dioxins in beef</i>
9.40 am	Dr Wim Verbeke, University Ghent, Belgium <i>European consumers' interest in beef safety and beef safety information</i>
10.30 am	Coffee/Tea break
Session 2 Emerging developments in healthy beef and innovation	
10.50 am	Dr Marcia Dutra de Barcellos, Aarhus University, Denmark <i>Beef healthiness and nutritional enhancement in beef as perceived by European consumers</i>
11.15 am	Prof. Nigel Scollan, Aberystwyth University, Wales <i>Impact of the rumen in influencing fatty acid composition of beef</i>
11.40 pm	Dr Oydis Ueland, Nofima Food <i>Consumer acceptance of novel beef processing technologies</i>
12.05 pm	Dr Alain Kondjoyan, INRA <i>Modelling the kinetics of formation of heterocyclic amines (HA) in slices of beef muscles subjected to heat treatments</i>
12.30 pm	Close

A demonstration on detection of foreign bodies/unwanted carcass components

The latest *ProSafeBeef* dissemination workshop took place on 3rd March 2009 in Denmark. The workshop was hosted by the Danish Meat Association and attended by 20 delegates. During the morning session, delegates heard talks from a variety of speakers, including representatives from the Danish Meat Association, on topics including detection of foreign bodies in meat, x-ray as process control, and multifrequency metal detection.

During the afternoon workshop delegates participated in a demonstration on the detection of foreign bodies/unwanted carcass components. Over recent years emerging technologies and the ever increasing level of computing power have allowed for better detection of foreign and unwanted material in meat and meat products. By altering the x-ray systems used in this method, a greater range of detection can be provided. In the first part of the workshop, vendors of

technical solutions shared the newest achievements in the area of detection of foreign bodies, with special focus on the challenges in meat and meat production. The second part of the demonstration provided delegates with a more hands-on session, with state of the art solutions demonstrated on real meat products.

For more information on this demonstration, please contact Bjørg Narum (bjorg.narum@nofima.no)



Delegates watch the demonstration



Demonstration attendees

Upcoming events: dates for the diary

Global Trends in Meat Production: implications for the UK

The 12th annual Langford Food Industry Conference on 13-14th May 2009 at the School of Veterinary Science, Langford, Nr Bristol, UK.

The University of Bristol is hosting this conference held in collaboration with the British Society of Animal Science. The UK meat industry is facing many pressures at present, caused by the economic upheavals, increasing raw material and other costs and challenges from the contribution of meat production to global warming. This year's conference considers these underlying factors affecting world trade in meat. We hear about recent changes in meat trade patterns and how different parts of the UK industry are responding positively to the new situation.

For further information contact Langford Continuing Education Unit:
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Meat – Muscle, Manufacturing and Meals

The 55th International Congress of Meat Science and Technology (ICoMST) meeting on 16-21st August 2009 in Copenhagen, Denmark.

The Danish Meat Research Institute (DMRI) and Centre for Advanced Food Studies (LMC) are pleased to announce plans for the 55th ICoMST meeting. The key theme of the 2009 ICoMST in Copenhagen is 'Meat – Muscle, Manufacturing and Meals' with focus on disseminating the latest research, innovations and visions within the field

of meat science and technology. The congress comprises discussions of scientific and practical approaches, and the state-of-the-art technology necessary to ensure a high quality production of meat and meat products.

For more information see <http://www.icomst2009.dk/>

Competitiveness Cluster InnoViandes

On the 17th and 18th November 2009 the first bi-annual European innovation conference MEAT'IN, dedicated to the meat and products industry, will take place in Clermont-Ferrand, France.

The aim of the event is to highlight meat companies and successful innovation projects, and allow exchanges between companies and research partners to boost innovation. Further information about this conference will become available on the *ProSafeBeef* website.

Advanced diary dates: forthcoming dissemination activities:

- July 2009 (subject to change)
 - Muscle profiling; maturing and tenderness of beef meat (location: Poland).
- September 09 (subject to change)
 - Good practices in slaughterhouses (location: Serbia)
- Before the end of 2009
 - Good practises in slaughter houses & muscle profiling and marination (location: Hungary)

Final plans will be available on the *ProSafeBeef* website towards the end of May 2009.

National network activities

As part of the activities within workpackage 6.3 (Technology transfer to SMEs), national networks have been set up in France, Norway and Spain.

Plans are underway for events on the following topics. Further information will be available by email and the *ProSafeBeef* newsletter from the end of May 2009.

- 1 National level network in France. In focus: carcasses contamination. This network will be organised by ADIV.
- 2 National level network in Norway. In focus: muscle profiling and new techniques. This network will be organised by Nofima Mat.
- 3 National level network in Spain. In focus: muscle profiling and cost-saving actions. This network will be organised by IRTA.

More Information

For more information on *ProSafeBeef* please visit our website at www.prosafebeef.eu or contact Robert Mooney, Project Manager, at robert.mooney@teagasc.ie.

ProSafeBeef is an Integrated Project supported under the 6th Framework Programme of the European Union.

It involves 41 leading research and industrial organisations working in 18 different countries.

ProSafeBeef is a five year project which commenced on March 1st 2007



Ashtown Food Research Centre

