

www.prosafebeef.eu

website re-launch



The brand new *ProSafeBeef* website was launched in October 2010. The website has been completely rejuvenated with a stylish new user interface and increased functionality making browsing, data access and connection with the concepts, science and people of the project far easier.

In this strive toward increased accessibility we have added a number of new sections and significantly more content reflecting the innovative research and results emanating from *ProSafeBeef* and the contemporary needs of our stakeholders. The most significant additions are the Industry and Technologies Platform, Consumer, Science, and Events sections. In addition, all sections have new page link features making it possible to access any page at one click.

Please visit us at www.prosafebeef.eu or contact Project Manager, Robert Mooney at robert.mooney@teagasc.ie for more information.

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EU Commissioner visits Teagasc Research Facility in Dublin

EU commissioner for Research, Innovation and Science, Máire Geoghegan-Quinn, with responsibility for the EU Framework programme visited Teagasc, Ashtown Food Research Centre on the 19th November 2010.

The event was also attended by 120 stakeholders from academia and industry and highlighted EU framework activities at Teagasc. A demonstration event in the Meat Industry Development Unit (a pilot scale abattoir) was used to showcase key knowledge and technologies emerging from *ProSafeBeef* including technologies to reduce microbial contamination of the bovine hide, a new method to detect

anti-parasitic agents in beef and novel active packaging systems. In her keynote address the commissioner highlighted the importance of the Knowledge Based

Bio Economy for innovation and development and the role of research and innovation in tackling Europe's economic problems.



Left to right: Dr. Geraldine Duffy (Project Coordinator *ProSafeBeef* and Head of Food Safety, Teagasc,) Prof Paul Ross (Head of Food Research Programme, Teagasc), Prof Gerry Boyle (Director, Teagasc) and Máire Geoghegan-Quinn (EU commissioner for Research, Innovation and Science)

Highlights from the 2010 *ProSafeBeef* conference

The 2010 *ProSafeBeef* conference "Advancing beef safety and quality through research and innovation" was held on the 6th and 7th October. Aberystwyth University's Institute of Biological, Environmental and Rural Sciences (IBERS) hosted the event, which was attended by around 100 delegates.



***ProSafeBeef* conference delegates**

The conference was opened with presentations from Noel Lloyd, Vice-Chancellor at Aberystwyth University and Rees Roberts, Chairman of Hybu Cig Cymru – Meat Promotion Wales, along with Nigel Scollan (Pillar 3 leader) IBERS, Aberystwyth University. Jeff Woods from Bristol University gave the keynote presentation on "Future perspectives in beef quality and safety".

The first session of the conference focused on consumer issues with presentations from Lynn Van Wezemael, University of Ghent, Belgium and Jens Kluger, MAPP, Aarhus University, Denmark on research conducted in Pillar 5 (Consumer need for beef safety, information and acceptability of novel processed beef products). Jonathan Bernie from Dunbia, UK also presented on consumer requirements and the impact of beef production and processing.

The second session focused on future industry challenges in meat safety and included several interesting presentations, beginning with

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Left to right: Prof Nigel Scollan of IBERS, Mr Rees Roberts, Chairman of Hybu Cig Cymru (HCC, Meat Promotion Wales), Prof Noel Lloyd, Vice Chancellor of Aberystwyth University, Mr Tim Rowe of Celtic Pride

Mary Howell from the Food Standards Agency, UK who spoke about the development of risk based proposals to support applications for change to current EU meat hygiene legislation.

"Nutrition challenges for the meat industry" was the title of the third session. Maureen Strong, BPEX, UK presented on the implications of red meat for nutrition and health. The other presentations in this session focussed on the impact of *n-3* polyunsaturated fatty acid (PUFA) enriched beef on the development of atherosclerosis in mice; the effect of concentrate finishing of grass fed steers on the fatty acid profile of meat; sensory characteristics of meat from cattle given a supplemental diet to enhance fatty acid profile of the muscle; *in vitro* assessment of rumen protection of technologically treated lipid sources; and new insights on ruminal lipolysis, (which is the first step in rumen lipid metabolism) that is key to reducing subsequent biohydrogenation, thereby improving PUFA content of ruminant products.

Duncan Sinclair, Waitrose, UK began an interesting final session, which focussed on the retail perspective by presenting the challenges for the retail sector.

Overall, the conference highlighted the valuable and interesting research and developments emerging from the *ProSafeBeef* project. The conference also included an afternoon of practical demonstrations (see: Farming Connect Industry Event).

Farming Connect Industry Event

Farming Connect helps Welsh farmers and their families to run their business more efficiently. It is funded by the European Agriculture Fund For Rural Development and the Welsh Assembly Government. On the afternoon of the 6th October, the *ProSafeBeef* conference linked up with the Red Meat Development Programme, which is delivered by Hybu Cig Cymru – Meat Promotion Wales on behalf of Farming Connect. Conference delegates and farmers were invited to attend practical demonstrations on IBERS Gogerddan Farm addressing major issues affecting beef safety and quality. The demonstrators were interviewed on the technologies and how *ProSafeBeef* has been involved.

Maximising value of beef carcasses – meat muscle profiling



Muscle profiling can be described as a technique involving the anatomical cutting of beef carcasses based on the muscles' tenderness. Dr Ian Richardson (Bristol University, UK) gave a short presentation on the hypothesis behind this technique. Bjorg Narum, (Nofima, Norway) described how this technique has been successfully applied by Norwegian butchers. This has resulted in a change in the butcher's handbook to include more muscles of value during the cutting of beef carcasses.

Dr Ian Richardson, University of Bristol talks about muscle profiling.

Can you give a brief description of the technology?

A similar project has been carried out in the USA and we wanted to see if this could be applied in Europe. The Norwegian group in particular took a lot of large muscles that were traditionally

minced and performed various laboratory tests for tenderness among others, and found some of the muscles on the shoulder are actually more tender than sirloin muscle.

What is the main advantage of this technique?

By using this technique the value of the carcass can be increased by up to €31 per head. In addition, a wider range of meat cuts can be offered to clients, for example Flat Iron Steak is now available in shops and restaurants in the USA.

How has *ProSafeBeef* been involved?

By being involved in *ProSafeBeef* the Norwegian group have been able to carry out this project and have yielded some good results. Pillar 6 of the project has given demonstrations to industry promoting this technique.

Controlling for Pathogens in the farm environment



Dr Johanne Ellis-Iversen (veterinary epidemiologist) presented on practical ways to reduce two common pathogens in the farm environment: verocytotoxin-producing *Escherichia coli* (VTEC) 0157 and *Campylobacter jejuni*.

Dr Johanne Ellis-Iversen, veterinary epidemiologist talks about practical ways to control for pathogens in the farm environment.

What is the reasoning behind controlling for pathogens?

To reduce public health threats by using normal everyday practices to control for VTEC 0157 and *Campylobacter jejuni*.

Dose contamination of livestock by VTEC 0157 pose a problem to industry?

In the United Kingdom, VTEC 0157 is linked to cattle in consumer minds; however, it is more an open farm problem especially in the UK. In the USA, contamination of beef and beef-products with VTEC 0157 is prevalent, and food is often recalled from supermarket shelves. A greater number of beef cattle in the UK are contaminated with VTEC 0157 as compared to mainland Europe. However, the causes are not fully understood although we have a greater proportion of young beef cattle (3-18 months) in which this bacterium is commonly found.

What are the benefits of being involved in ProSafeBeef?

Being involved in ProSafeBeef has enabled me to present my data to researchers in my area. In order to control these organisms you need to have a strong evidence base and no one study group can do that. ProSafeBeef enables researchers all over Europe to investigate and find a good control measure and validate this in other European countries. It also provides an opportunity to learn a lot about what other researchers are doing through ProSafeBeef events. Another benefit of being involved in ProSafeBeef is that the science is disseminated to those people who need to adopt the control measures to control these organisms, i.e. the farmers present at this demonstration.

Palatability Acceptability Critical Control Point Model (PACCP)



Dr Paul Allen (Teagasc, Ireland) presented his research results demonstrating the application of the Meat Standards Australia (MSA) prediction model for grading palatability of Irish beef eating quality among Irish consumers.

Dr Paul Allen, Teagasc talks about the Palatability Acceptability Critical Control Point Model.

Can you explain the Palatability Acceptability Critical Control Point Model (PACCP)?

PACCP is based on the MSA model for grading on palatability of meat products. PACCP can be used to select meat of

more consistent quality, so that meat with a quality guarantee can be sold to consumers. PACCP is a system that covers the whole food chain from processors to farmers. MSA-trained processors grade the meat and collect information on pH, for example. The model uses this information to predict the eating quality of each cut by about five different cooking methods. Each cut is then graded on a 5-star rating scale.

How likely will this be used in Ireland and other European projects?

The MSA model has been applied to Irish consumers and results showed that the model fits to this population as to Australian consumers of beef. However, when our final results were presented to the beef industry very little interest was shown. They explained to me that they are already implementing systems as required by the retailers. I believe that it will be introduced in Ireland and other European countries when the retailers say they want it.

What are the benefits of being involved in ProSafeBeef?

While this work started with national funding, through ProSafeBeef I have liaised with the French partners of the project. Jean-Francois Hocquette (INRA) and I are now collaborating together and sharing data that may be used to develop a new French or European MSA model.

Method for immobilisation of bacteria on hides



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This technique works to immobilise bacteria to the hide of a bovine carcass before skinning. Dragon Antic (University of Novi Sad, Serbia) gave a presentation on the method of this technique and results from a commercial beef abattoir where the Shellac was applied to beef carcasses.

Dragon Antic, University of Novi Sad, Serbia talks about a method of reducing pathogens in meat and meat products.

Can you give a brief description of the technology?

Hide decontamination treatments are already used in some abattoirs (e.g. USA) but not in Europe. These treatments aim to eliminate or kill as many bacteria as possible from carcasses. Our treatment is a completely new preventative approach to hide decontamination strategies. Bacteria are essentially 'glued' onto the hair of hides, preventing their transfer onto meat carcasses during the skinning operation. The ultimate goal of all treatments is to prevent transfer of bacteria from hides onto carcasses in the dehiding point of the slaughter line.

Does this technology have any benefits to industry?

This technology, if applied by industry, will improve the microbial safety of beef meat. Carcass contamination can occur during slaughter and dressing operations from faecal material among other sources, including the hide. If the transfer of bacteria from the hide to the meat can be prevented, then contamination of meat products will be reduced.

How has being involved in ProSafeBeef helped you do this work?

This work was funded as a part of the ProSafeBeef project and was crucial to carry out this work.

Identifying exposure to pathogens in beef and beef products across Europe

Dr Geraldine Duffy (Pillar 1 leader and Head of the Food Safety Department at Teagasc, Ashtown Food Research Centre) describes her research work on tracking and characterising pathogens in the beef chain.



Swabbing hide

Research carried out by Pillar 1 leaders found that the levels of four common beef pathogens (verocytotoxigenic *Escherichia Coli* (VTEC serogroup 0157), *Listeria monocytogenes*, *Salmonella* and *Campylobacter*) on bovine hide and pre-chill carcasses of animals at slaughter and in beef products at the retail level were generally low.

Results showed that VTEC 0157 prevalence on hides ranged from 7-15% and on pre-chill carcasses 1-4%, while non 0157 serogroups were lower, ranging from 1-6% on hides and 0-1% on carcasses. *Campylobacter* had a highly variable prevalence on hide (28-51%) and on carcasses (0-15%). *L. monocytogenes* was present on 13-27% of examined hides and 3-14% on carcasses. *Salmonella* was present on 1-7% of hides and less than 2% of carcasses. The rate of cross transmission from hide to carcass was less than 10%.

At retail level, data from raw minced beef indicated that the prevalence of the selected pathogens were higher than those on carcasses, particularly for

L. monocytogenes where prevalence and numbers increased significantly in samples at the retail stage of the chain. Some regional differences in pathogen characteristics were noted in relation to antibiotic resistance and virulence. In relation to VTEC, although there is a huge diversity of serotypes only a small portion have human virulence potential.



E.coli 0157 and E.coli 0111

This study was undertaken as part of the ProSafeBeef project to quantitatively track pathogens through the beef chain in four different countries (Ireland, Poland, Brazil and Greece). Isolates were recovered from the bovine hide and pre-chill carcasses of 1,200 animals, ground raw beef products, and ready-to-eat beef products, and characterised to gain knowledge of the diversity and human virulence of common beef chain pathogens.

Foodborne pathogens are of major public health concern worldwide, and can lead to significant economic losses for the agri-food sector. Beef can be a vehicle in the transmission of food pathogens and this study adds to the limited number of studies that have tracked pathogen progression through the beef chain or assessed the clinical significance of strains transmitted by this vehicle. This data is feeding into the development of quantitative risk assessment models for these pathogens in beef.

ProSafeBeef demonstrations and training sessions

Previous demonstrations and training sessions

On the 19th November at Ashtown Food Research Centre, Dublin three demonstrations were presented:

Shellac-immobilisation of bacteria on hides

The hide is a key source of microbial contamination of beef carcasses. Even when best hygiene practices are followed, some microbial contamination of the carcass including foodborne pathogens can occur. Shellac is a food-grade, insect-produced natural resin and a Shellac solution is sprayed on to the hides along the initial skinning cuts. Results from studies using this Shellac-based treatment showed a reduction in microbial contamination of beef carcasses more so than other hide decontamination treatments. The use of Shellac-based treatment to reduce transmission of bacteria from cattle to hide is promising.

Modified atmosphere packaging

It is known that consumers normally judge meat at point of purchase primarily on its colour. Meat packed under high oxygen in modified atmosphere packaging (MAP) produces a bright red colour which is attractive to the consumer. Disadvantages of the system are that the colour has a limited duration (well before the product shelf-life), oxidation may occur leading to rank odours and flavour, the meat is less tender and the packaging is relatively bulky. Vacuum packaging avoids the majority of these issues but has the disadvantage that the meat is darker in colour and thus less acceptable to the consumer. This demonstration showed a comparison of steaks which had been packed in high-oxygen MAP or vacuum packed and steaks which had been pre-treated before vacuum packing. The pre-treatment involved treating the meat with a protective atmosphere for three different periods of time, removal

of the protective atmosphere and then vacuum packing. The pre-treatment step resulted in vacuum packed steaks which were of a similar colour to the normal high oxygen MAP packaging and thus will be much more acceptable to the consumer.

Detection of anathematic residues

The QuEChERS (quick, easy, cheap, effective, rugged and safe) extraction method was developed for the detection of 38 anthelmintic drug residues in beef. The development of this technique has increased sample through-put, reduced solvent waste (by 10 fold) and analysis time (by 5 fold). The technique provides high recoveries and has improved food safety.

Upcoming demonstrations and training sessions

Reduction and detection of carcass contamination on the slaughter line

This demonstration will take place on 9th February 2011, in Clermont-ferrand, France.

On-line measurements for fat composition

This demonstration will take place on 15th February 2011 in Oslo, Norway.

Added value in muscle profiling

This training session will take place on 18th January in Bristol, UK.



Added value in muscle profiling training

ProSafeBeef partners are invited to contact Catherine Souty-Dametto by email (catherine.dametto@adiv.fr) if they would like to propose a training session to be organised in their country.

Upcoming events: dates for the diary

Food and Beverage Test Expo

8th – 10th February 2011

Cologne, Germany

The Food and Beverage Test Expo will be held from the 8th to the 10th February 2011, at the Koelnmesse exhibition centre in Cologne, Germany. This trade fair will provide information on a full range of test and evaluation technologies, solutions and services, ranging from nutritional analysis and food composition, authenticity and origin testing, to microbiological testing, GMO detection, allergen testing, vitamin testing, food irradiation testing, residue and contaminant testing at all levels. For more information please visit: <http://www.foodtestexpo.com/index.php>

Food Integrity and Traceability Conference

21st – 24th March 2011

Queen's University, Belfast, Northern Ireland.

The Food Integrity and Traceability International Conference will be held from the 21st to the 24th March 2011 at Queen's University Belfast. The conference will focus on three key themes: reviewing recent progress in delivering safe and authentic food to the consumer; identifying the greatest current and emerging threats to the integrity of the agri-food supply; and delivering new analytical means of verifying the integrity of the agri-food supply chain. For more information please visit: <http://www.qub.ac.uk/sites/ASSET2011/>

57th International Congress of Meat Science and Technology (ICoMST)

7th – 12th August 2011

Ghent, Belgium

The 57th International Congress of Meat Science and Technology (ICoMST) will be held from the 7th to the 12th August 2011 at Ghent University, Belgium. ICoMST is the annual forum for the international exchange of new scientific ideas in meat science and technology. The key theme of the 2011 ICoMST is 'Global challenges to production, processing and consumption of meat'. For more information please visit: <http://www.dda.ulg.ac.be/documents/pdf/57thICoMST.pdf>

62nd Annual Meeting of the European Association for Animal Production

29th August – 1st September 2011

Stavanger, Norway

The 62nd Annual Meeting of the European Association for Animal Production (EAAP) will be held on the 29th August to the 1st September 2011 in Stavanger, Norway. The conference programme will cover all aspects of scientific achievement within animal production, including animal genetics, physiology, nutrition, management and health. For more information please visit: <http://www.eaap2011.com/>

7th International Conference on Predictive Modelling of Food Quality and Safety (ICPMF7)

12th – 15th September 2011

Dublin, Ireland

The 7th International Conference on Predictive Modelling of Food Quality and Safety (ICPMF7) will be held from the 12th – 15th September 2011 in Dublin, Ireland. This conference will bring together leading academics, research scientists and food professionals who are currently developing and using simulation and optimisation tools to enhance the quality and safety of food. It will highlight the diversities, commonalities and future challenges that we face as predictive modellers in food. The conference will include plenary sessions by high profile international speakers, opportunities to present original research and a comprehensive social program. A separate optional workshop will also be held on the 16th September 2011, following the conference, focusing on predictive modelling applications and the use of powerful software tools. For more information please visit: <http://www.eventelephant.com/pmf7>

ProSafeBeef student wins National Award

ProSafeBeef post-graduate student, Michelle Whelan won the Royal Dublin Society student medal for presenting her paper on 'Determination of anthelmintic residues in milk using UPLC-MS/MS with rapid polarity switching'. A new analytical method for determining the major classes of anthelmintic drug residues in beef and milk was described.

Michelle Whelan is a post-graduate student at the Teagasc Food Research Centre, Ashtown, Dublin, Ireland. Michelle was also awarded the Institute of Food Science and Technology Ireland (IFSTI) Presidents Medal for best food presentation. On behalf of *ProSafeBeef* dissemination team we wish you congratulations Michelle and well-done on flying the *ProSafeBeef* flag so high!



Chairman, RDS Committee of Agriculture & Rural Affairs, Jim Flanagan, with Michelle Whelan, Teagasc Ashtown Food Research Centre, Walsh Fellow of the Year and winner of the RDS medal, and Teagasc Director Professor Gerry Boyle

ProSafeBeef, Advancing Beef Safety and Quality through Research and Innovation: European Framework Programme 6: (FOOD-CT-2006-36241)

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 coordinated by Dr. Geraldine Duffy at Teagasc, Ashtown Food Research Centre, 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

