



MED-VET-NET NEWS

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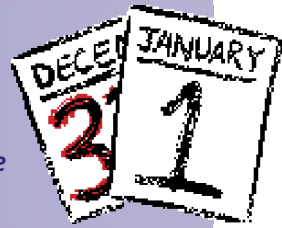
Med-Vet-Net Communications Unit

In this final issue of 2007 we highlight some of the scientific achievements of Med-Vet-Net in Year 3 of the project.

Diane Newell reminds us of the risks of zoonotic infections from our pets.

We have news of a new online microbiology blog and podcast; opportunities for collaboration and links with the European Community Project Managers' Association; and dates of external congress.

We wish you all a happy New Year and the very best for 2008!



Scientific Achievements

Med-Vet-Net Scientific Achievements: Year 3

As we reach the end of 2007, we look back a few selected scientific achievements of Med-Vet-Net in Year 3 of the project.

A fully harmonized and standardized, real-time surveillance database system to detect disease clusters of *Salmonella*, *VTEC* and *Listeria monocytogenes* for food, public health and veterinary laboratories has been delivered to ECDC.

PulseNet Europe – Med-Vet-Net's Workpackage 4 – developed a network of public health, veterinary and food laboratories for molecular surveillance of food-borne infections in Europe. This network has established a customized, web-based database system to detect disease clusters and investigate outbreaks of *Salmonella*, verocytotoxin-producing *E. coli* and *Listeria*.

Now that this Workpackage is complete, all PulseNet Europe

activities and molecular databases will be transferred to the European Centre for Disease Prevention and Control (ECDC) in Stockholm. This transfer is also supported by the European Food Safety Authority, which is important as PulseNet Europe has many partners from food and veterinary laboratories.

A web-based 'atlas' of the incidence of salmonellosis in Europe has been developed in collaboration with EnterNet.

Workpackage 6 aims to establish a geographical informations systems (GIS) network and build up GIS capacities for analysing exposure to major bacterial food-borne pathogens within various epidemiological contexts.

The first GIS project has now been

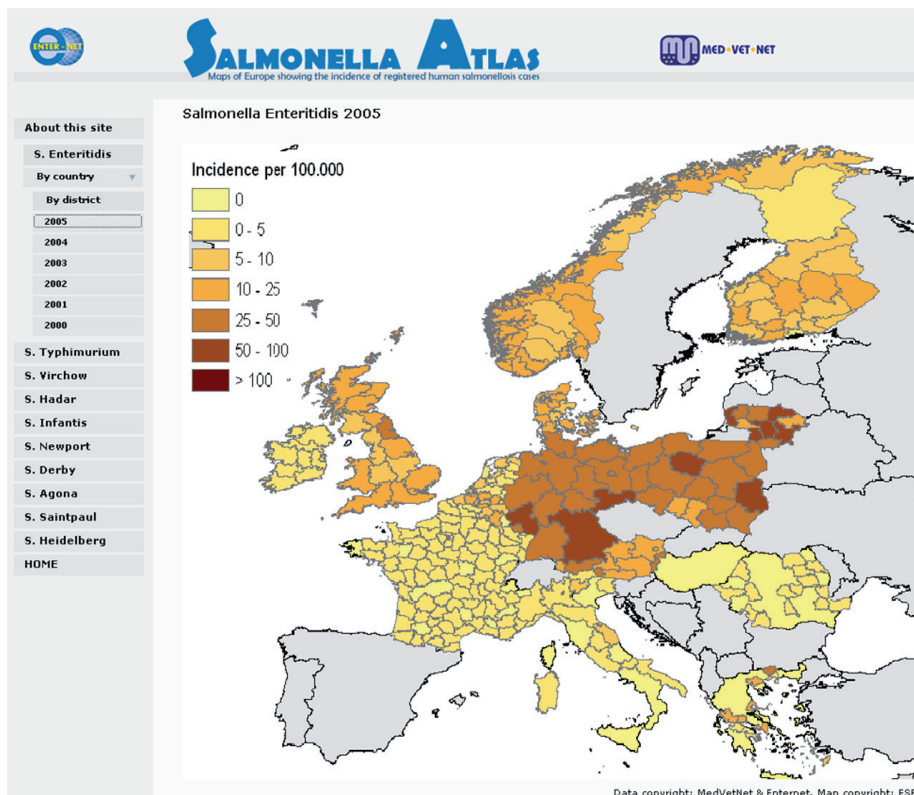
completed. An Internet-atlas of salmonellosis in Europe with a series of maps showing the incidence of laboratory-confirmed human cases by region and year for the 10 most common serotypes. The atlas is available at: www.epigis.dk

Standardized rapid methods for the detection and characterization of *Salmonella* Genomic Island 1 have been delivered.

Salmonella Genomic Island 1 is a gene cluster found in *S. Typhimurium* DT104, which is zoonotic in origin and causes numerous infections in humans. DT104 is associated with an enhanced ability to cause disease (virulence) and multi-drug resistance. Workpackage 21 has developed a phenotypic method to detect SGI1-positive isolates from

strain collections, based on their resistance profile. A real-time PCR protocol for the sensitive and specific detection of SGI1 has also been optimized. And, a novel fingerprinting method to characterize the non-multi drug resistance region of SGI1 has been developed.

A paper on the results of the molecular analysis of a strain collection of 445 multi drug-resistant European isolates of *Salmonella*, *Shigella* and *Proteus* will be published in 2008.



An image from the Internet atlas of salmonellosis in Europe developed by Workpackage 6

Harmonized and standardized PCR-based methods for the detection of *Cryptosporidium* and *Giardia* have been established.

Zoop-Net – Workpackage 22 – aims to implement expertise on the detection and control of *Cryptosporidium* and *Giardia* at the European level.

A common molecular platform has now been established in Europe and comparable data on *Cryptosporidium* and *Giardia* can now be generated to investigate the epidemiology of these infections and to study the role of potential animal sources in human disease.

The dynamic database, containing DNA sequences and genotype data linked to epidemiological data, is available at: <https://hypocrates.rivm.nl/bnwww/MedVetNet/>

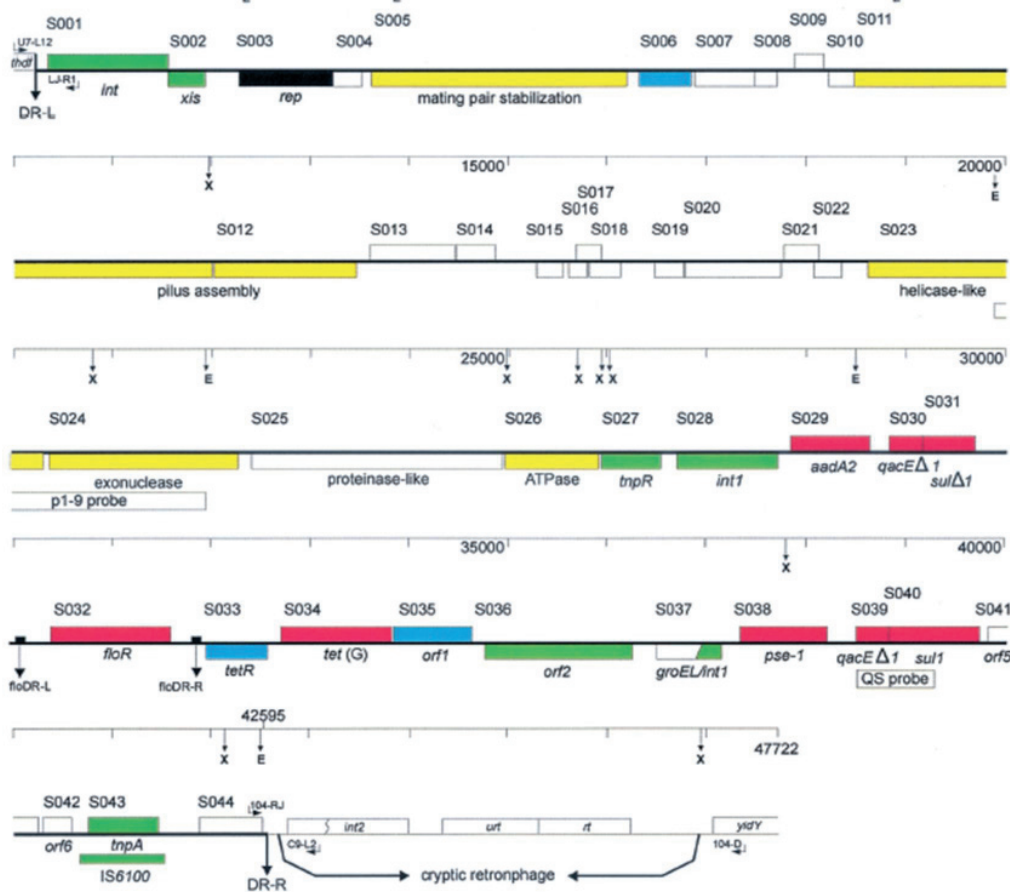
A strategic document 'Methodological choices for calculating the disease burden and cost of illness of food-borne zoonoses in European countries' has been adopted.

This document from Workpackage 23 – Prioritizing food-borne and zoonotic hazards at the EU level – indicates that disease burden and cost-of-illness calculations make several choices about the exact methodology. These choices have an impact on the final results and must be appropriate for the decision context of the study, and should reflect the values that exist in the societies under study.

The document is available at: www.medvetnet.org/pdf/Reports/Report_07-002.pdf

A comparison of the European *Campylobacter* risk assessment has been completed.

Workpackage 24 aims to compare



Linear representation of *Salmonella* Genomic Island 1 – the subject of study in Workpackage 22.

existing national quantitative risk assessment models on *Campylobacter* in broiler meat in Europe, and to develop a European consensus approach. For a comparison of models.

For a comparison of models, expert partners held three subgroup meetings covering: (1) the farm phase; (2) the processing and retail phase; and (3) the consumer preparation and illness phase. Models were discussed in detail to identify the important differences and similarities, and to find the strengths and weaknesses in the available risk assessments. Results have been presented and discussed in a meeting with risk managers and other interested parties. This has resulted in a report (www.medvetnet.org/pdf/Reports/D24-1.pdf) and a review paper on *Campylobacter* risk assessments in Europe has been prepared.

The virulence gene content of 1021 strains of *E. coli* and *Salmonella* from eight partners in seven countries has been investigated and analysed by standardized PCRs.

The identification of new and emerging pathotypes of *Salmonella* and verocytotoxin producing *E. coli* (VTEC) is essential if intervention strategies are to be developed. In Workpackage 26, a number of virulence-associated genes have been selected for the screening of strains.

Criteria for the PCR of these genes (virulotyping) including primers and conditions were distributed to partners along with control DNA. In total 1021 isolates have been selected and tested.

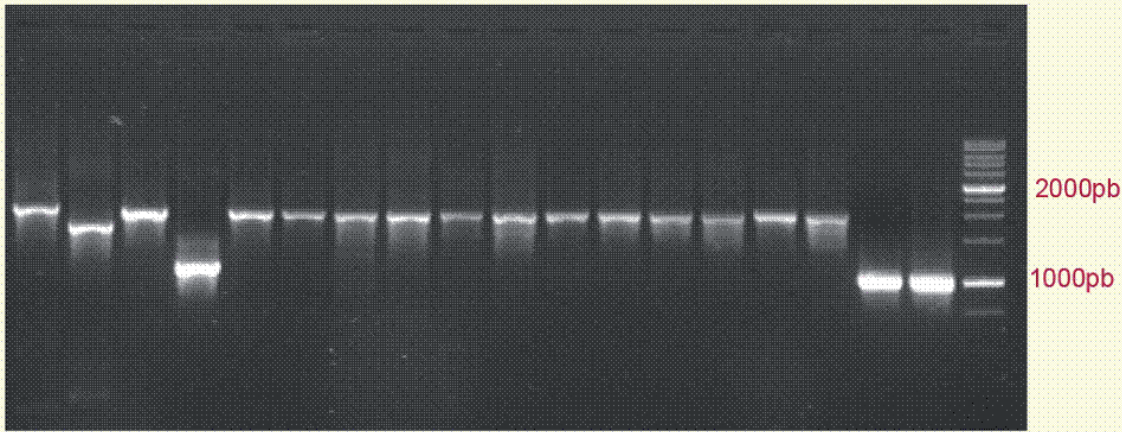
All the isolate and PCR data have been curated in a database and some exploratory analysis has been performed. The data have been re-validated to ensure there were no transcriptional errors in the database. The preliminary analysis indicates significant differences in the distribution of virulence genes in *E. coli* and *Salmonella* strains across Europe.

Significant progress has been in the detection and epidemiology of *Trichinella* using novel diagnostic reagents and tests as well as risk assessment approaches.

Workpackage 27– TrichiMED – looks at harmonization of *Trichinella* infection control methods, quantitative risk assessment in pigs and an early diagnosis in humans to increase treatment efficacy. The workpackage has developed serodiagnostic tests for the early detection of *Trichinella* infection, including methods for recombinant antigen expression.

TrichiMED also works on harmonizing veterinary control methods for *Trichinella*, particularly between National

1S 1M 2S 2M 3S 3M 4S 4M 5S 5M 6S 6M 7S 7M 8S 8M 9S 9M



PCR results illustrating the presence of the transposon bearing *armA*. Lanes marked S are from *E. coli armA* transconjugants; lanes marked with M correspond to control plasmid pMUR050 from Spain.

Reference Laboratories, in light of new EU regulations. Proficiency samples were distributed in two ring trials to compare the sensitivity of different official detection methods.

In addition, ISS, a partner in Workpackage 27, has developed and validated an indirect ELISA test based on the *T. spiralis* excretory/secretory antigens. This ELISA was evaluated by a ring trial involving 23 European laboratories. Results indicate that the test is reproducible and robust suggesting that it can be used in active surveillance.

Poland has been identified as potential European reservoir of the 16S rRNA methylase, *armA*, conferring resistance to aminoglycosides.

In order to determine the prevalence of isolates containing gene *armA* (one of a family of determinants for aminoglycoside resistance via 16S rRNA methylase), Workpackage 29 partners used their respective electronic databases to screen any organisms for suspect resistance phenotype patterns (as indicated by high-level aminoglycoside-resistance). In total, nearly one million strains from 12 countries were analysed in this way. Those isolates that fulfilled this criterion were then tested by PCR using a harmonized PCR-protocol. The results showed that none of the approximately 500 000 animal isolates stored in the database bore evidence for aminoglycoside-conferring 16SrRNA resistance. However, out of the approximately 500 000 human isolates investigated in the electronic database, subsequent genetic analysis of potentially positive isolates revealed that 27 carried the *armA* gene. Five of these strains, investigated at HPA,

were strains originating from a hospital outbreak in Poland. The remaining 22 isolates were all identified at the PZH in Poland. These results indicate that, of the 12 EU countries tested, Poland is the only major reservoir to date of this antimicrobial resistance determinant.

Serological tests for zoonotic viruses such as HEV have been improved with the use of recombinant antigens.

Workpackage 31 aims to generate knowledge and methodologies on *Hepatitis E virus* (HEV), *Anellovirus*, and *Encephalomyocarditis virus*. There are currently no methods for the culture of HEV. However, the cloning and expression of antigens and capsid proteins, by molecular engineering techniques has been undertaken. Several cDNA clones from swine genotype 3 and human genotype 1 (Sar-55) viral strains have been generated by various partners in Workpackage 31 and work is in progress to express these proteins in large amounts and in antigenically conserved forms. In particular, using a baculovirus expression system, significant amounts of *virus-like particles* (VLP) of a French genotype 3 HEV have been synthesized by AFSSA. These VLP appear well preserved by electron microscopy, and react efficiently in both ELISA assays and western blotting with the sera from infected humans, swine and wild boar. Major production of a truncated form of G1 HEV has also been achieved at the VLA. These antigens, in either assembled or soluble forms, appear suitable for establishing sensitive and specific immunoassays for HEV antibody identification.

The assembled VLP preparation is being used, in collaboration with ISS, to produce monoclonal antibodies (MAbs)

to conformation-dependent antigenic sites of the HEV capsid.

A novel approach has been delivered, using sero-epidemiology, to determine more accurately the public health burden of food-borne disease.

The main objective of Workpackage 32 is to provide estimates of the population-based incidence of *Campylobacter*

and non-typhoid *Salmonella* infections in European countries, which are independent of the sensitivity and specificity of the respective countries' surveillance systems, in order to allow a comparison of the population burden of infections across these countries. The methodological approach to achieve this is sero-epidemiology: from measured levels of specific antibodies in population-representative serum collections, estimates of the incidence of infection are generated with the help of a mathematical back-calculation model.

During the first year of the Workpackage, the methodology has been refined and finalized. The model development and its preliminary use to determine exposure to *Salmonella* using Danish sera has been published (Simonsen et al. 2007; *Epidemiol. Infection*; Online 3 Aug; <http://tinyurl.com/3yoqgn>). A protocol for a European pilot study involving sera from at least six EU countries has been agreed and suitable serum collections have been identified in Denmark, Netherlands, France, Finland, Poland, Romania and the USA (as an external partner).

Further details of these and other scientific achievements of the Network in Year 3 of the project are available in the Med-Vet-Net Annual Report, September 2006–August 2007. Printed copies will be available in the New Year; to request a copy, please contact the Communications Unit.

Dogs, bugs and Christmas Turkey

Those of you who know me, know how much I love my dog Jani. Over the last few weeks Jani had started continuously scratching and without obvious evidence of small motile multi-legged visitors, I got worried. A rare trip to the local vet was organized. The young vet (she surely couldn't have graduated yet!?) diagnosed some sort of anonymous skin infection and pointed a finger at poor Jani shivering in the corner. 'You will have to bath him and don't forget to leave this (very expensive) shampoo on for at least 10 minutes!' Now Jani is a golden retriever and as such would not hesitate to leap into a freezing cold river in the middle of winter snows, but show him a warm bathroom and he will run a mile. As he weighs nearly 30 kilos lifting him in and out of a bath was beyond my abilities – so picture, if you must, me in underwear and shower cap, with very resistant dog in my brand new shower room. Ten minutes is a long time to keep a wet and reluctant dog in one place – especially one slippery with soap bubbles – but it was nearly Christmas so I sang him carols as we sat there under the warm water! It is a good job no one else was around to laugh.

The incident has a serious side though. How much do we think about the hygiene of our close animal companions? Most of us would worry if we were unable to bathe daily but we think nothing of having a pet in the house that is probably not bathed from one year to another. We willingly share our environment with these walking, furry, reservoirs of bacteria, viruses, fungi and parasites and yet direct contact with animals as a source of zoonotic disease goes unrecognized by the general public and largely underestimated by public health authorities.

Fussing over our pets provides us with stress-releasing pleasure but fur from cats, dogs and even hamsters etc. harbours pathogens such as toxoplasma, ringworm, and campylobacters; feathers from cage birds carry the agents of pittsacosis and chlamydiosis and even the scaly surface of reptiles carry salmonellas. We treasure our pets but sometimes they can be less than friendly and bites and scratches can transmit serious, sometimes life-threatening, systemic infections from bacteria such as *Bartonella* and *Pasturella*. The range of potential pathogens carried in the oral cavity of such animals is incredible. In a sentinel study (Talan et al., 1999) of 107 patients presenting at an emergency room with dog and cat bites as many as 16 different bacterial agents were recovered per bite. So if your dog refuses to let go of the Christmas turkey you accidentally left on the kitchen

table and within his teeth range – then don't argue with him!

Perhaps more worryingly is the recent association between antimicrobial

How much do we think about the hygiene of our close animal companions?

resistant bacterial infections in humans and exposure to dogs and cats. At the recent EUUS-Safefood meeting on the Ecology of Antimicrobial Resistance in Segovia, the expert, international group present recognized that the non-human use of antimicrobials in animals is an increasing threat to public health. Although the right of sick animals to be treated with antimicrobials was acknowledged on ethical grounds (at least by the majority), strategies to limit resistance spread via this route were strongly recommended. This need is supported by several recent outbreaks in which pet owners and animal health workers became infected with multidrug-resistant *Salmonella* Typhimurium. In each case, isolates from associated dogs and cats were identical to those from the humans. Of course the direction of the transmission route is debatable but clearly we need to consider the pets in our environments as potential reservoirs of such agents.

This is even more evident with methicillin-resistant *Staphylococcus aureus* (MRSA) infections. Strains identical to EMRSA-15, causing disease in humans, have been found in dogs and animal hospital staff in the north of England (Baptiste et al., 2005) indicating that we can share a common pool of these bacteria with companion animals. However, in the case of MRSA, the zoonotic agent transmission flow is most likely from human to animal as clearly demonstrated by the recovery of a strain of MRSA in a dog infected by its owner (van Duijkeren et al. 2004).

The Christmas holidays are a wonderful time to share with your family and with your pets. Just remember that, as you feed you dogs and cats left-over turkey, you may all be also sharing your microbial flora. I, and a sweetly smelling Jani, send you best regards for a successful year in 2008.

Diane G Newell



Jani during a sunrise walk on a frosty December morning.



European Community Project Managers' Association

The European Community Project Managers' Association was established in early 2006 as a forum for Project Managers to exchange information and share experiences of issues and challenges relating to co-ordinating and managing FP6 projects. Through the Association, Project Managers can share their knowledge and expertise to tackle issues that continually arise in these projects. Association members are individuals who are active in the day-to-day project management within the context of co-ordinating European Framework Programme projects. The Association is based in the UK and welcomes members from other countries to join and attend its meetings. The Association meets three times per year in locations close to London.

Currently the Association has over 45 European Projects represented

and Med-Vet-Net has been an active member through current project managers Diane Newell and Trudy Wassenaar.

With the launch of FP7 and the expansion of the European Union, the Association looks forward to growing and developing links with more interested parties with the aim of sharing best practice and innovation within a supportive environment. The Association is also available as a communication partner for official bodies and as a resource for FP project management training activities.

The Association has a dedicated web-based email forum for members, which is extremely active. Access to the forum is password protected.

For further information about the Association please contact the Chairperson:

Mr Barry Yau
Project Manager
SAFE Network
Research Support Services
University of Warwick
Coventry CV4 8UW
United Kingdom

Email: b.c.yau@warwick.ac.uk
Tel.: +44 (0)24 7657 4305

Micropod Online

The Lucy Harper from the Society for Applied Microbiology and Lucy Goodchild from the Society for General Microbiology have joined forces to create 'Micropod Online' – a news website for Microbiology. From this site, you can download or subscribe to the microbiology podcast, read the latest microbiology news, comment on the blogs or email the two Lucys with any burning questions/pictures/comments/jokes/ideas.

The first podcast is: Festive fungi (...and bacteria, and viruses, and protozoa...)

This episode takes a look at Christmas from a microbe's eye view. Turkeys have it hard this year, those which didn't get bird flu got killed anyway and some of the rest could be giving us salmonellosis on the 25th of December. Will you be eating turkey this Christmas?

There is an interview with Lewis Dartnell, astrobiologist extraordinaire, about life in the snow and lots of other Christmassy stuff.

See: www.micropodonline.com

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The podcast

Episode 1: festive fungi (...and bacteria, and viruses, and protozoa...)
We take a look at Christmas from a microbe's eye view. Turkeys have it hard this year, those which didn't get bird flu got killed anyway and some of the rest could be giving us salmonellosis on the 25th of December. Will you be eating turkey this Christmas? We talk to Lewis Dartnell, astrobiologist extraordinaire, about life in the snow and lots of other Christmassy stuff.

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11–14 June 2008
Palais du Grand Large
Saint Malo
France



4th Annual Scientific Meeting on Zoonoses Research in Europe

11–14 June 2008, St Malo, France

**The 4th Med-Vet-Net Annual Scientific Meeting
will be held at Palais du Grand Large, in the
historic town of St Malo, in Brittany, France.**

Online registration will open in January 2008; please
look out for the announcement in the next
issue of *Med-Vet-Net News*.

**For more information visit: <http://www.medvetnet.org/mvnconf08>
or email: MVNConf08@medvetnet.org**

External congress

Society for Applied Microbiology Winter Meeting, 9 January 2008, Royal Society, Carlton House Terrace, London, UK

Session A Quality assurance and accreditation issues in microbiology

Session B. The Microbiology of alcoholic beverages

For more information:
www.sfam.org.uk

Florence Conference on Phenotype MicroArray Analysis of Microorganisms, the Environment, Agriculture, and Human Health, 19–21 March 2008, Florence, Italy

The principal emphasis in the conference is on using phenotypic analysis and phenotypic data to gain a deeper understanding of the biology of microorganisms.

Further information:
<http://www.poloscitec.unifi.it/phenotype/>

Society for General Microbiology, 162nd Meeting, 31 March – 3 April 2008, Edinburgh International Conference Centre, Scotland

For more information see: www.sgm.ac.uk/meetings/MTGPAGES/Edinburgh2008.cfm

Society for Applied Microbiology Spring Meeting, 9 April 2008, Aston University, Birmingham, UK

'Broadening Microbiology Horizons'

For more information see: www.sfam.org.uk

Molecular Basis of bacterial infection: basic and applied research approaches, 11–17 May 2008, Wellcome Trust Genome Campus, Hinxton, Cambridge, UK

This course will introduce participants to concepts and techniques currently used in studies on the molecular basis of bacterial infection. Several themes will run throughout the week and these

will provide a framework for bench experiments, demonstrations, supporting lectures and discussion groups. Core themes will include mutagenesis, tissue-based assays, reporters, tissue culture assays, and microscopy (fluorescent and scanning/transmission electron microscopy).

Deadline for applications: 25 January 2008

American Society for Microbiology, 108th General Meeting, 1–5 June 2008, Boston, Massachusetts, USA

For more information see: <http://www.gm.asm.org/>

'The need for speed', 2nd Annual Meeting of EPIZONE, 4–6 June 2008, Brescia, Italy

The aim of this meeting is to inform both internal and external delegates about EPIZONE activities and to discuss recent issues and new developments concerning epizootic diseases. Control of animal diseases starts with a global awareness of risks, preparedness on introduction, and prompt actions in order to prevent or reduce economic losses.

There will be plenary lectures by keynote speakers in the fields of the EPIZONE themes: Diagnostics, Intervention strategies, Epidemiology and surveillance, and Risk assessment. Delegates are invited to send in abstracts to present their latest research results in the fields of the EPIZONE Themes. Oral and poster presentations will be selected from the submitted abstracts by the Scientific Committee.

For more information see: www.epizone.eu.net/annualmeeting/default.aspx

EPIZONE, Bluetongue Satellite Symposium, 7 June 2008, Centro Pastorale Paolo VI, Brescia, Italy

'Bluetongue in Europe, back to the future !!'

The Symposium will consist of lectures by invited keynote speakers, oral presentations as well as poster presentations. Abstracts will be divided into four topics:

- Intervention strategy and policy: Treatment of animals, control measures, and economic aspects
- Diagnostics: Detection of disease,

antigen, RNA, and antibodies

- Epidemiology/surveillance/risk assessment: Field and molecular epidemiology, monitoring, etc.
- Entomology/vectors: Culicoides research, insecticides and repellents

For more information see: www.epizone.eu.net/bluetongue/default.aspx

Future challenges to microbial food safety, an in-depth expert meeting to explore ways to address future challenges to microbial food safety, 9–12 June 2008, Bilderberg Hotel 'Buunderkamp', Wolfheze, Netherlands

The conference will be sponsored by the Dutch Food and Consumer Products Safety Authority (VWA) and the European Food Safety Authority (EFSA).

Those interested in attending the conference are invited to E-mail their application to:
VWAfoodmicrobiology2008@vwa.nl



Contact us

Med-Vet-Net News is published monthly by the Med-Vet-Net Communications Unit.

Editor: Jennie Drew

Email: communications@medvetnet.org

**Tel: +44 (0)1234 271020
Fax: +44 (0)1234 271025**

Society for Applied Microbiology Bedford Heights, Brickhill Drive Bedford MK41 7PH, UK

Contributions and suggestions are welcome. Deadline for publication is 1st of each month.

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