MICROBIAL RISK ASSESSMENT

Workpackage 14 - Pre-harvest Microbial Risk Assessment (MRA)

Introduction
Risk analysis has been used for decades as a means of support with decision-making in areas of major uncertainty. It has been used in disciplines such as engineering (e.g. nuclear power plants, chemical industry, pharmaceutical industry and construction industry), management and finance (e.g. project management, bank loans, stock market, insurance). More recently, the application of risk analysis to food safety has had an increasingly important role. Currently, risk analysis is widely recognised as the fundamental methodology that should support the development of food safety standards. As initially defined by the Food and Agriculture Organisation of the United Nations (FAO), World Health Organisation (WHO) and the Codex Alimentarius Commission (1995), risk analysis consists of risk assessment, risk management and risk communication. Risk assessment is the scientific aspect of risk analysis, and its application was further promoted by the World Trade Organisation in 1995 with the ratification of the Agreement on the Application of Sanitary and Phyto-sanitary Measures (SPS Agreement). This requires that any measures applied to protect human, animal and plant health are developed using a scientific and transparent approach.

Traditionally, food safety risk assessment has been developed with respect to chemical hazards, but it is increasingly used to assess microbiological hazards. The purpose, or intended use of a specific risk assessment will vary from case to case and will initially be defined by the risk manager or decision-maker. Among the most common applications are: import and export risk assessment, evaluation of surveillance and control programmes, modelling of the farm-to-fork continuum, but also specific pathogen-commodity combinations. Note that this list of purposes is neither exhaustive nor mutually exclusive. Any risk assessment can, and often does, serve more than one purpose.

Although the newly established risk assessment community is in agreement that ‘farm-to-fork’ models are a valuable tool to evaluate alternative risk management interventions along the food chain, few assessments have included the farm phase in great detail. This is probably due to a lack of data and modelling techniques that can account for the complexity of non-linear processes. There are numerous possible interactions, a variety of management procedures, production forms and traditions that occur in primary production. This means there is a pressing need for evaluating the possibilities for modelling (parts of) this initial phase in production. Evaluation of the various methods that might be useful to modelling primary production processes should include an up-to-date review of the methods used and a systematic evaluation of their strengths and weaknesses. In order to minimize the input of pathogens to the harvest phase from the pre-harvest phase, intervention strategies need to be developed. The relative or absolute impact, whether measured in animal health or economic terms, of various intervention options can be evaluated with validated pre-harvest models.

Aims and objectives of Workpackage 14
The aim of Workpackage 14 is to provide a catalogue of the current expertise of pre-harvest risk modelling in Europe. The identification of available knowledge and experience will inherently lead to the recognition of knowledge gaps that may be filled through the collaboration of MVN Member Institutes in the future.

The specific objectives of workpackage 14 are to evaluate the applicability of various modelling methods already applied in a wide range of disciplines for pre-harvest risk assessments: to define pre-harvest model pathways for major food animal productions in Europe, to assess data availability for parameter estimation, to determine data requirements for specific pre-harvest processes and to link pre-harvest risk assessment models to economic models. Results and information will be disseminated as the project develops via the Med-Vet-Net member website and via three workshops which will run during the first 18 months of the project.

Work programme
Task 1. Identification of potential partners and definition of a work plan for collaboration involving three workshops:
1. initial meeting
2. formulating specific projects
3. summing up, integration with Workpackage 13 and development of a new plan of action (including project proposals for continued funding)

Task 2. Formation of an inventory of previous or on-going pre-harvest assessments by surveying published research and critically evaluating their strengths and weaknesses.

Task 3. Definition of pre-harvest model pathways for all major types of animal production and assessment of data requirements for all components of these pathways. A list of meaningful purposes, subsequent model pathways, and data gaps, will be defined for each major food animal production site in Europe. Differences in pathways between EU-countries will be accounted for by consulting national experts on the various food animal production types.

Task 4. Assessment of data availability. Large quantities of data gathered, as part of surveillance or monitoring programmes, are essential inputs to risk assessment models. Methods that make use of available data sources need to be developed. Where data is unavailable, expert consultation will be used. Combining expert opinion and defining distributions based on expert judgement remains a matter for debate, therefore a workshop will be organised based on this topic.

Task 5. Assessment of mathematical and statistical methods for modelling pre-harvest processes and the possibility for combining modelling techniques. Linear and less complex processes may be
modelled similarly to processes further down the production chain, whereas more complex interactions may require new modelling techniques. The use of appropriate models which have already been developed in relation to other sciences or for other purposes will be surveyed.

**Task 6. Assessment of possible linkage to economic models.** One of the main purposes of (pre-harvest) MRA is the evaluation of risk mitigation strategies, which also includes economic considerations. This calls for synergy with Workpackage 13 and a joint workshop will be considered.

**Developments**

**Workshop 1**

On October 28-29, 2004, the WP14 kick-off Meeting was held in Copenhagen, Denmark. During this meeting, the capacity for performing pre-harvest risk assessment was assessed for each participating institute. The workshop reviewed and the procedure for the inventory of completed or on-going risk assessments was discussed. It was decided that we were to join our efforts with the COST920 QMRA Inventory although we drafted an additional questionnaire to accompany the existing COST920 information sheets. This was necessary to capture the information that is required specifically for pre-harvest risk modelling.

At the meeting, two breakout groups were formed to discuss structure, data requirements and data availability in a single specific pre-harvest MRA modelling situation. This was necessary in order to focus the discussion on data requirements and data availability.

The aim of the assignment was to discuss the following questions in relation to constructing a pre-harvest MRA model:

1. Question(s) to be answered
2. Interventions to consider in the model
3. Model components and structure
4. Data
   a. requirements
   b. availability
   c. gaps
   d. solutions to fill data gaps (e.g. data collection, surrogate data, expert opinion)
5. Available modelling techniques
6. Model validation
7. Risk communication (between assessor and manager)

The discussion on which animal species and what pathogen to focus on was itself a useful one, with respect to choosing an area for the final project proposal at the end of the first 18 months.

**Workshop 2**

On April 14-15, 2005, our second workshop was hosted by the Completense University of Madrid. The first day focused on the presentation and discussion of various modelling techniques for pre-harvest modelling. The modelling methods presented covered Bayesian Inference modelling (Helen Clough, University of Liverpool, UK), SIR-modelling or infectious disease modelling (Emma Snary, VLA – see her biography), dose-response modelling (Arie Havelaar, RIVM), the modelling of freedom-of-disease (Matthias Greiner, DFVF), the potential for using epidemiological study output for parameter estimation in risk assessment (Eric Evers, RIVM), risk assessment on animal feed (Maria Nöremark, SVA) and generic risk models (Danilo Lo Fo Wong, DFVF – see his biography above).

The second day of the workshop was devoted to the work remaining in Workpackage 14. The various reports that form part of the deliverables were discussed in terms of their objectives, their focus and their contents. Subsequently, tasks were assigned to WP14 participants to provide sections and chapters to the various reports: a report on pre-harvest modelling techniques, an inventory on pre-harvest models and data availability, a report on model pathways for major food animal productions in Europe and data requirements, and a report on the interaction between economic and risk assessment models.

**Workshop 3**

The third and final workshop in WP14 is planned in Berlin, November 23-24, 2005. The objective of the workshop is to discuss the status of the project, the future of our collaboration (e.g. by preparing and submitting a joint grant proposal to the sixth framework) and the interaction between economic and risk assessment models which is the topic of the last report in Workpackage 14.

Economic analysis is a powerful tool to support decision-making. It provides a common denominator for evaluating diverse outcomes, ranging from public health outcomes to the impact on trade. With benefits and costs in the same monetary units, the net benefits of alternative strategies to reduce risks can be compared directly. Once the public health protection benefits have been estimated, changes in industry and government sector costs can be estimated for each intervention under consideration, both in the short and long term. The economic analysis can inform the risk manager about the size of the likely gains and losses by different groups for each intervention option. The linkage between food safety risk assessment and economic analysis as a means of supporting decision-making is still a novel and somewhat controversial approach that is in development. As Workpackage 13 considers the interaction between economic and risk assessment models in general, we will focus on the incorporation of economic parameters in pre-harvest risk models (e.g. production costs, reduced expenses on therapeutic drugs).

**PEOPLE**

**Dr Danilo Lo Fo Wong, Workpackage 14 leader.**

Danilo Lo Fo Wong holds a M.Sc. in biology from the Agricultural University in Wageningen, The Netherlands, and a Ph.D. in veterinary epidemiology from the Royal Veterinary and Agricultural University in Copenhagen, Denmark. He has worked at the University of Guelph in Canada, and at the Animal Health Service in The Netherlands before moving to Denmark. He currently works as a research Epidemiologist at the Danish Zoonosis Centre in the Department of Epidemiology and Risk assessment at the Danish Institute for Food and Veterinary Research. He is involved in several international networks on surveillance of foodborne disease and foodborne pathogens (WHO Global SalmSurv), Risk assessment (Med-Vet-Net, COST 920) and antimicrobial resistance in bacteria of animal origin (ARBAO-II, TRAINAU). His main expertise is in foodborne pathogens and disease epidemiology, surveillance and control programmes and the planning and performing risk factor studies, case-control studies, outbreak investigations, burden of illness studies and quantitative risk assessment. He frequently serves as trainer or speaker at national and international courses and meetings on topics like integrated surveillance systems, food safety strategies, risk assessment, epidemiology of zoonoses, food attribution modelling and foodborne disease surveillance and outbreak investigation. Danilo manages the COST 920 inventory on QMRA studies in Europe.

**Emma Snary is the Thematic Representative for the Risk Research Thematic area.** She is a mathematician, with a B.Sc. and Ph.D. from Cardiff University. The title of her Ph.D. is “Modelling treatment effects in the HIV/AIDS epidemic” and was completed in 2000. While completing her Ph.D. she lectured mathematics to undergraduate students. In February 2000, Emma started work for the Veterinary Laboratories Agency (VLA) as a risk assessor. She is now the workgroup leader of the Risk Analysis workgroup with the Centre for Epidemiology & Risk Analysis. The Risk Analysis workgroup is a team of 10 scientists and works on issues relating to both veterinary public health and animal health. Emma’s own areas of scientific interest are food safety and antimicrobial quantitative risk assessment and she has worked on, and managed, many projects in this area. She has taught risk analysis at various UK organisations and regularly gives lectures on the subject for an MSc. in Veterinary Epidemiology. She was a member of the Salmonella in broilers drafting group in the WHO/FAO microbiological risk assessment expert consultation. Emma has only just got married (June 2005) and lives in London. In her spare time she enjoys running, music and socialising with her friends and family.
The Winchester Meeting - A major milestone for Med-Vet-Net

Med-Vet-Net held its first general scientific meeting at University College Winchester between 29 June & 1 July 2005. The three-day meeting was attended by 183 delegates from all partner countries within the network. Most partners sent 13-15 delegates which indicates the commitment and support of the Institutes and our Governing Board to the network. We were particularly encouraged by the attendance of so many younger scientists who contributed considerable energy and enthusiasm – though it tended to be the older scientists who still had the energy to head for the bars in the late evenings!

Presentations
The programme was packed with many opportunities to attend oral presentations and appraise posters. There were approximately 70 short scientific presentations made by representatives of all the network partner institutes and 104 poster presentations displayed throughout the meeting. The presentation topic areas included Detection & Control, Epidemiology, Risk Research, Host-Microbe Interactions and New, Neglected and Topical zoonoses. All the abstracts of the posters and oral presentations will be placed on the website.

The oral presentations were run in four parallel thematic sessions in different locations, which encouraged lots of opportunity for exercise walking between buildings. This format was certainly a challenge for the organizers but worked largely due to the efforts of all the speakers ensuring their presentations were submitted to the right computer and the conveners who kept everyone on time! The meeting format also allowed time for general discussion at the end of each session and some of these discussions were stimulating and provocative. From those of you who attended the meeting, we would like to hear your views and comments regarding the format of the presentation sessions.

Your feedback will influence future meeting formats.

Treasure Hunt
On Wednesday, tight little groups of people arrived from each partner institute. However, these groups were soon forcefully broken up by our Communications Team to search for Treasure Hunt clues in the streets of Winchester. Ten teams dispersed at 4.30pm from King Alfred’s College in various directions. It was a site to behold seeing people scattering across the graveyard searching for the grave of Anne Mayor. Some teams were determined to win, cleverly coxing locals for answers. Others took a more relaxed stance and enjoyed the taste of a local beverage at the Wykeham Arms (and other pubs...) along the way. Congratulations to Team N who scored an impressive 42.5 out of 50. Team members Riita Majala (Uni of Helsinki), Stefan Hertwig (BfR), Henrich Wegenar (DFVF), Alessandra Carattoli (ISS), Susanna Sterberg Lewerin (SVA) and Hendrik-Jan Roest (CIDC) all received a commemorative Winchester mug as their prize.

Communications Workshops
On the final morning of the meeting the Communications Team held a Communications Workshop. There was an impressive turnout considering this workshop started at 8.30am on the day after the conference Dinner! The workshop began with an excellent presentation from Dr Jon Green of the HPA discussing internet database technology and how this can be applied to the needs of the network. Workshops on internet database technology were run in different locations, which encouraged lots of opportunity for exercise walking between buildings. This format was certainly a challenge for the organizers but worked largely due to the efforts of all the speakers ensuring their presentations were submitted to the right computer and the conveners who kept everyone on time! The meeting format also allowed time for general discussion at the end of each session and some of these discussions were stimulating and provocative. From those of you who attended the meeting, we would like to hear your views and comments regarding the format of the presentation sessions.

Your feedback will influence future meeting formats.

Message from the Chairman
I write to you all following an extremely successful meeting held in Winchester (29 June – 1 July 2005). I saw a lot of excellent science, but more importantly got a sense of enthusiasm from all participants for the Med-Vet-Net project. There will be a number of phases in the ultimate goal of producing a virtual Institute. We are in the first phase of pulling together teams, establishing mechanisms of working together, creating tools such as harmonised typing and strain characterisation, epidemiological databases and shared datasets. These will provide the common language, the common currency, for the network.

The next stage is harder, which is to turn the groups of collaborators into fully integrated single teams even though they are on multiple sites. Once we have achieved that, the problem will be sustainability. This is a key issue that the Board will address at its meeting in October. However, I do have a note of caution: we must not confuse activity with productivity, and we must not confuse productivity with impact. We must find ways of assessing the health gain benefits of our work. For that we need clear measurable goals and good criteria for identifying priorities. In identifying these goals, we may need to re-address the balance of our work. These are all issues that the Board will address in October. Apart from overall strategy and ensuring good governance, the Board also needs to know bout the things not going well or particular problems, as a key function of the Board must be to help resolve these issues. The Board cannot do this unless it knows what the problems are, so we need you to tell us. You should all feel free to inform Board members or me directly.

What you are doing is something quite special, and if it works, will become a model not only for Europe, but for other parts of the World. I have been immensely impressed by what I have seen. Med-Vet-Net is you and it is evident it is in very safe hands.

Pete Borriello
network. An illustration of the new Med-Vet-Net private website was then presented by Staffan Tamm and Lars Bostrom from the SVA. Finally, Dr Claire Bithell from the Science Media Centre, based at the Royal Institution in London, spoke about the importance of scientists communicating with the UK media. We send a big ‘Thank you’ to all the contributors for their efforts.

Thank You
We are enormously grateful to our two keynote speakers: Prof Nina Marano from CDC, Atlanta and Prof Corrie Brown from University of Georgia. They both took time out from their busy schedules to cross the big pond to present the audience with their incisive and thoughtful overviews of the past and future of zoonoses. We hope that a copy of their talks will be available on the website in the near future.

We also thank two members of our Advisory Panel, Dr Rita Majajla (University of Helsinki) and Dr Marta Hugos (EFSA) and two of the Governing Board members, Prof Peter Borello (HPA) and Prof Steve Edwards (VLA) for taking the time to attend the meeting. Peter is Chairman of the Governing Board and he kindly provided the after dinner speech. His command of ten languages to say “good evening” was impressive, even with the help of several glasses of wine.

Bringing Scientists Together
When planning the first General Meeting of Med-Vet-Net, we identified a number of objectives which would be outcomes of bringing scientists from across the partnership together. These were:
• to network and develop a common understanding of Med-Vet-Net activities
• to present the range of scientific expertise, facilities and skills across Med-Vet-Net
• to provide opportunities for the development of collaborations.

Networking
The success of the Treasure Hunt was remarkable. Suddenly the institute groups disappeared and people were actively seeking out like-minded scientists from other partner organisations in both the social and scientific activities. The energy and enthusiasm was infectious and was reflected in the general noise of excited voices and deep discussions at breaks and mealtimes.

Science
One glance at the abstracts will prove the excellence of the science presented at this meeting. The quality of the posters was as good as any international-level meeting – and in many cases better. The diversity of interests, the timeliness of the technologies and the breadth of investigatory skills all served to exemplify the wealth of resources the whole network has to offer to European Zoonoses Research.

Collaboration
Throughout the three day period it was encouraging to note small groups of delegates holding informal meeting and discussions. Of course, all the hope is that this discussion will be translated into new collaborative projects in the future. Already one new discussion group on New and Emerging Zoonoses has been generated, others will hopefully develop in the future.

The Future
Prof Peter Borello, Chairman of the Governing Board gave us the key to the future of Med-Vet-Net in his after dinner speech. He reminded us that we must translate our efforts into “impact on European Public Health” in order to sustain our network. This will be the target for our strategy for the next Joint Programme of Activities currently under preparation. In the meantime we are, of course, already planning the next meeting – somewhere south and sunny perhaps. But we are also taking the time to bask in the collective praise – some of which is given below. Well done to everyone!

“I had a really good time and I met a lot of new interesting people” (Sussana Lukinmaa, DFVF)

“Really enjoyed the Winchester conference everything was just perfect. Made lots of new contacts and was able to discuss my new project with most of the participants involved.” (Roberto La Ragione, VLA)

“Three fantastic meeting days.” Bo Sundqvist, SVA

“It was very well organized and I enjoyed it very much (like all the others that I have spoken with).” Jaap Wagenaar, ID-Lelystad

“I really enjoyed the Winchester meeting, and what a lovely town” Henrik Wegener, DFVP

“It was a perfect conference and I learned a great deal”. Corrie Brown, Keynote speaker

“I was very impressed by everything: the organisation, the topics, the atmosphere etc…” Isabel Minguez Tudela, EC Project Officer

“you have much to be proud of with this network and I wish you the best of success with it in the future!” Nina Marano, Keynote speaker

Diane Newell, Claire Cassar and the Communications Unit

Sustainability of the Network
Following the request from the Governing Board to study the sustainability of our network, a call for tender was launched to hire a consultant who will advise us as to the legal requirements to ensure that Med-Vet-Net remains sustainable. The deadline for applications is 1 September and the study will take place during the last three months of 2005. The chosen consultant will be required to liaise with Legal Officers of each Partner Institute, in order to obtain necessary information about each institute. They will then suggest the appropriate legal status for each partner.

Video-link facilities for the Network
Following the rejection of the SSA proposal submitted to the EC in February 2005, another call for tender was launched to assess the need for video conferencing facilities for the network. This study will also focus on the educational and training needs of the user. If approved, video-conferencing facilities will allow remote collaboration between all scientific and administrative teams within the network. The resulting document will be assessed by the Co-ordinating Forum who will then decide whether to approve the proposal and if so, which facilities are required.

Preparation for future meetings
(Co-ordinating Forum, Advisory Panel, and Governing Board meetings)
These three meetings occur in Paris at AFSSA at the end of September and beginning of October. Below is a reminder of the dates:
- Co-ordinating Forum meeting: 28th September
- Advisory Panel meeting: 10th October
- Governing Board meeting: 14th October
Invitations have been sent and registration will be ongoing until mid-August. The Administration Bureau is in charge of the logistics of each of these meetings. Participants will be provided with all necessary information about accommodation arrangements and any other relevant information.
Agendas of each meeting and relevant papers are currently being prepared and first drafts will be sent out in August. Agenda items should be proposed by members to their respective Chairperson.

Preparation of the drafting of the budget of the next Workpackages
Request forms for the definition and assessment of the budget for the next joint programme of activities (JPA) have been drafted and have been sent to the relevant workpackage leaders and participating partners, with copies going to Institute Representatives. These forms allow each workpackage to clearly identify the different costs incurred. In order to teach partners how to complete these forms, the Administration Bureau visited most of the partners and met with the Institute Representatives, the Workpackage Leaders and the Financial Officers during the month of June. The Winchester General Meeting was also a good opportunity for us to answer any financial queries. From the feedback of all partners involved, it is clear that these training visits were very constructive and will aid drafting the budget enormously. Partners who have not yet been trained, will do so during July.

Admin Bureau

UPDATE
19th Meeting of the European Macrophage and Dendritic Cell Society 2005
6-8 October 2005, Amsterdam, The Netherlands

Macrophages and dendritic cells: are they close neighbours, distant cousins, or something else altogether? The meeting will cover a range of topics, highlighting the latest developments in this rapidly expanding field of research. We expect to welcome around 300 preclinical and clinical scientists from Europe, and beyond, to exchange basic and translational research information. Invited speakers, all accomplished experts in their field, will give updates on their latest findings and insights. From the submitted abstracts additional oral presentations will be selected as well as poster presentations. Please visit www.emds.nl or www.macrophage.de for the complete program and registration.

Animal Agriculture and Food Safety Risk Analysis Course 5-16 September 2005, Ghent, Belgium

The course has an international reputation as being the most comprehensive and intensive available in the field. Animal agriculture and food safety risk analysis require advanced knowledge of certain aspects of probability and statistical theory, of simulation modelling, and most of all - of problem-solving. During an intensive two weeks, you will learn how to produce international standard risk analyses that focus on addressing the practical management of risks. The course focuses on understanding and the application of the tools and techniques of risk analysis entirely through solving practical problems. For more information please visit www.risk-modelling.com/training_ahafsra.htm. To book please contact Vose Consulting, Tel/fax: +33 553 918603 www.risk-modelling.com

International Food Symposium
A DVD, called “The Global Business of Food” has been produced from this symposium. Speakers include:
Dr. David Hughes (UK )
Dr. Manfred Kern (Germany )
Mr. Wim Tacken (The Netherlands )
Dr. Peter Jones (Canada )
Mr. Christopher Wolf (USA )
Dr. Marcos Fava Neves (Brazil )
Mr. John Dean (Canada )

Topics include:
What global consumers want?
How food retailing is going to change in the next decade
Who are the new winners and losers in global food production?
What are the emerging food products and areas that are making money?
How environmental issues are impacting on the food industry

Please visit www.theinnovators.net/food or http://theinnovators.net/food/food-dvd.mpg for a three minute demonstration of the DVD. If you require any additional information, you call 1-866-280-3438 (Canada & USA ) or 403-215-4545 (outside North America ).

New Diagnostic Technology: Applications in Animal Health & Biologics Controls. Applications in disease surveillance, molecular epidemiology and quality control tests of vaccines (OIE, IAB’s, APHIS, AFSSA) 3-5 October 2005, Saint-Malo, France

The objective of this conference is to give a presentation of the new technologies applied to the detection of agents or toxins, the diagnosis of mainly animal but also human diseases and the quality control of human and veterinary vaccines. It is intended to present the difficulties and the limits of these new techniques with their validation procedures. Practical examples will be illustrated as shown in the preliminary programme. Please visit www.zoopole.com/ispaia/labs2005 or contact:
Genevieve Clement, Congress secretariat, ISPAIA - BP 7 - 22440 Ploufragan - France
Tel : +33 2 96 78 61 30 - Fax : + 33 2 96 78 61 31
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4th International Veterinary Vaccines and Diagnostics Conference (IVDC)
25-30 June 2006, Oslo, Norway

The conference provides an excellent opportunity to meet colleagues and be updated on recent progress and future perspectives in the fields of vaccinology and diagnostics. The IVDC has become an important meeting place for regulatory authorities, pharmaceutical companies and the scientific community.
POSITIONS AVAILABLE

1. **PhD STUDENTSHIP - Disinfection of MRSA in Hospitals Using Novel Catalysts**
   **School of Pharmacy, De Montfort University, Leicester, UK**

**BACKGROUND**
Hydrogen peroxide and metal catalysed hydrogen peroxide processes have been used for many years for disinfection. However the catalyst and the hydrogen peroxide have always been in the solution phase, which has many associated problems, such as, lack of regenerability and recycling, contamination of treated solution with metals etc. It is our intention to investigate a system whereby the catalyst is present not dissolved in solution but supported on a polymer mesh which can then be immersed in solution if required, or used as a wipe for surface disinfection or for disinfection of the air. Our group has patented such a catalyst, simple to produce in the form of a knitted wipe or disinfection bath, which is known to decompose a wide range of compounds, but as of yet it has not been studied for its ability to act as a disinfectant.

**AREA OF RESEARCH**
The issue of most immediate concern to the public is the eradication of MRSA from hospitals. Other areas that are of concern to the health of the public are that of the disinfection of Cryptosporidium and Giardia which are not effectively eradicated by traditional chlorination agents. The chlorination process is also extremely environmentally unfriendly, unlike simple disinfection using our catalyst, which works at room temperature using air or air/hydrogen peroxide.

This work is entirely novel and would provide an interdisciplinary collaboration between chemistry/microbiology/pharmacy practice. A studentship is available for 3 years at standard EPSRC rates (£11,000 per year) starting October 2005. Applicants with a suitable academic background must have been resident in an EU country for at least 3 years. Please contact Dr Katherine Hudders for further information.

Please email CV to katherine.hudders@dmu.ac.uk before the 3rd of August if you wish to apply.

2. **RESEARCH ASSOCIATE**
   **Department of Animal Sciences University of Tennessee, Knoxville**

**RESPONSIBILITIES**
Using fundamental and contemporary approaches (e.g. microarray, proteomics) to examine the molecular basis of pathogen-host interactions, study the colonisation and persistence of Campylobacter jejuni in animal reservoirs with the ultimate aim of developing diagnostic and control strategies. Develop new diagnostic methods and issue guidelines. Functioning as centres of expertise on the control of Campylobacter spp. and related standards and issues the related standards and guidelines. Functioning as centres of expertise on the control of Campylobacter spp. and related standards and issues the related standards and guidelines.

**QUALIFICATIONS**
Bachelor’s or Master’s degree in animal science, microbiology, or related field required. Prior experience in animal work and research experience in molecular biology and enteric pathogens is desirable. Willingness to interact with others including staff, students and faculty is essential for performing the described duties.

**AVAILABLE:** Immediately.

SAFETY: Competitive salary with an attractive fringe benefit package.

APPLICANTS: Applications will be reviewed as received and continue until a suitable candidate is identified. Applicants should submit a letter of application, curriculum vitae, and contact information for three references to: Dr. Jun Lin, Department of Animal Science, University of Tennessee, 2505 River Dr. Knoxville, TN 37996-4574 Phone: 865-974-5598, Fax: 865-974-7297 e-mail: jlin6@utk.edu

3. **RESEARCH FELLOW (RA2)**
   **Department of Clinical Veterinary Science, Bristol University, UK**

This new post is funded for 2 years (available from October 2005), with possible extension, to undertake investigations, in an internationally renowned laboratory, on the persistence and dissemination of Campylobacters derived from poultry carcasses during processing in poultry abattoirs. The project involves the development and application of novel molecular tools and approaches for the tracking of campylobacters through the food chain. In particular the project will aim to track and enumerate specific strains using approaches including the identification of strain-specific oligonucleotide probes. The successful applicant must therefore have familiarity with the routine culture of campylobacters and molecular methods for their detection. Expertise in campylobacter molecular typing methods and an understanding of the molecular basis of campylobacter strain diversity would be preferred. Although the appointee will be expected to work independently, close communication with other members of the team and research partners (Prof. Diana Newell, VLA) will be essential. The ability to work within a multi-disciplinary team is very important to the success of this project. Contact Dr VM Allen, Research Fellow, Department of Clinical Veterinary Science, Langford, North Somerset BS40 5DU, tel: (44)(0117)9289430, fax: (44)(0117)9289324, Viv.Allen@bristol.ac.uk

An exciting scientific program has been prepared covering the various areas of vaccinology and diagnostics. Please visit: www.vvd.org. Send all enquiries to vvd@veso.no

7th OIE Seminar on Biotechnology on the ‘Application of biotechnology to zoonotic disease diagnosis’ Montevideo (Uruguay), 17 November 2005

Using its global network of over 150 reference laboratories and collaborating centres, the OIE collects and analyses the latest scientific information on animal disease control methods and issues the related standards and guidelines. Functioning as centres of expertise on the control of Campylobacter spp. and related standards and guidelines.

The OIE Reference Laboratories provide scientific and technical assistance and expert advice on topics linked to surveillance and control of 96 OIE listed animal diseases and zoonosis.

Please visit: http://www.oie.int/eng/montevideo/051117.htm

**GRANTS AVAILABLE**

**LIVESTOCK FOR LIFE**

This is a new global grant scheme from the Wellcome Trust. Up to £3 million of funding is available for the scheme, with up to £150,000 available per application. Are you an organisation involved in animal health and based in, or active in, developing countries? If so visit www.wellcome.ac.uk/livestock/pe

Livestock for Life aims to strengthen links between livestock keepers, practitioners, researchers, scientists, policy makers and other stakeholders working in the field of international animal health.

For more information on how to apply for funding and who is eligible, visit www.wellcome.ac.uk/livestock/pe

Deadline for receipt of preliminary applications: 29 July 2005

**CONTACT US**

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