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Investigations of human cases of psittacosis in two poultry slaughterhouses, Pays de la Loire, March-April 2009

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Two investigations of human cases of psittacosis were conducted by the Regional Epidemiology Unit of the French Institute for public health in March-April 2009 among workers of two different poultry slaughterhouses in the “Pays de la Loire” region. Human cases of *Chlamydophila psittaci* infection were found among workers, confirming that psittacosis is an occupational zoonosis. No specific position in the slaughtering process was found to be particularly exposed. Veterinary investigations, designed to trace potential sources of infection, were not possible because the poultry flocks were slaughtered and the premises were disinfected.

A comparative study of the risk perceptions and risk communications of stakeholders within five European countries after the issue of the roadmap

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Science-based control measures (such as the ban of the inclusion of meat and bone meal in feed and the removal of potentially BSE infected animal tissues, the so-called specified risk materials, from the feed/food chains) by the EU and elsewhere resulted in the continuous decline of the BSE epidemic in recent years. The pressure to remove some control measures led the European Commission to issue a TSE Roadmap allowing an open discussion on the potential for regulation relaxation. To investigate the risk perceptions of stakeholders and how to improve the communication in dealing with the TSE roadmap, a qualitative social research has been carried out. Forty-six in-depth, semi-structured face-to-face interviews with risk managers and stakeholders were obtained in Belgium, France, Germany, Italy and the United Kingdom. The main results obtained may be summarized as follows. TSE is no longer a hot topic: the interviewees shared the view that the TSE risk is clearly on decline and the overall BSE (and TSE) risk perception is low. Moreover, all examined stakeholders appreciated the TSE Roadmap as a new communication strategy; however, they provided several suggestions to improve the communication in the field of TSE.

Co-circulation of bluetongue disease and epizootic haemorrhagic disease of deer viruses in 2009 in the Reunion Island

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Bluetongue virus (BTV) and Epizootic Haemorrhagic disease of deer virus (EHDV) are endemic in Reunion Island and regularly cause some clinical outbreaks more or less severe in cattle (EHDV) or in sheep (BT) as already observed in 2003. In January 2009, cattle raised on the Island of Reunion showed clinical signs suggestive of one or other of these arbovirus diseases. Analysis by polymerase chain reaction (RT-PCR) performed on blood samples from 116 cattle present in various districts of the Island detected the presence of the EHDV genome in 106

samples and, in 5 out of them, the presence of both BTV and EHDV. Seven strains of EHDV and 1 strain of bluetongue virus were isolated in embryonated eggs and BHK21 cell culture. By analysis of the nucleotide sequences in segment 2 of the genome (encoding the VP2 serotype specific protein) of the isolates, it was possible to identify the serotypes of these two orbiviruses and to compare those sequences with others available in database.

Qualitative and quantitative risk evaluation of the risks associated with *Trichinella* in Belgium: current status and prospects

Sabine Cardoen, D. Berkvens, L. Claes, S. Van Gucht, J. Dewulf, L. De Zutter & C. Saegerman

This article presents a current epidemiological analysis of the Belgian situation regarding the parasite *Trichinella*. Based on official data obtained with the digestion method, the real prevalence of *Trichinella* in Belgium is estimated at 0.0025% in wild boars and at 0.2% in foxes. In domestic swine, horses and the other domestic and/or wild animal species, the prevalence is zero. In man, the last case of trichinellosis caused by consumption of pork dated from 1893, and the last case caused by consumption of wild boar meat dated from 1978. Based on a quantitative method describes by Alban *et al.* [2008], the probability that the Belgian domestic swine population is free of *Trichinella* is higher than 97%. Given these data's, the risk level of *Trichinella* in Belgium can be considered as negligible. In accordance with Regulation (EC) No 2075/2005, Belgium is in state to submit a request to be officially recognized by the European Commission as a region where the risk of *Trichinella* in domestic swine is negligible, in order to benefit, in case of acceptance, from an alleviated surveillance program. Within this alleviated surveillance program, it is no longer necessary to test slaughter pigs raised under controlled housing conditions. On the other hand, it remains necessary to test systematically all domestic swine at risk (outdoor-reared pigs and breeding pigs) and all horses. Concerning the wild fauna, it is recommended to test wild boars systematically, and to test annually a number of foxes, rats and other wild carnivores. The importance of the strict respect of the bio-security measures at the farm is also underlined.

An economic assessment of the use of enrofloxacin in the treatment of colibacillosis in broilers

S. Krebs, Catherine Belloc & X. Malher

The present study was designed to evaluate the economic benefit of using enrofloxacin in the treatment of colibacillosis in French broiler production. The implemented methodology was a pharmacological and economic approach using a cost-effectiveness analysis based on the implementation, setting and solving of a decision tree, describing the progress to treatment decisions on the farm. It was based on 95 batches that had received an initial treatment against colibacillosis within the first ten days then, in some cases, a second one. In terms of cost-effectiveness ratio, the analysis showed that, in the specific context of this sample, the preferred use of one or the other of the alternative treatments (enrofloxacin vs other antibiotics) could be justified depending on the farmer's willingness to pay for the additional effectiveness associated with the use of enrofloxacin.

Perception of PRRS as a risk by producers from west of France

J. Le Palud, Nathalie Chatelier, P. Blanquefort, C. Boulay, D. Pécaud, N. Rose & Catherine Belloc
Our survey was designed to characterize the perception of PRRS by producers located in Bretagne, Pays de la Loire and Basse-Normandie. Fifty-eight producers whose herd was either

PRRS negative, PRRS positive or under a program to become negative were selected for an interview. The amount of their knowledge regarding PRRS, as well as how important this disease was for them depended on the PRRS status of the herd. Indeed, PRRS was better known and regarded as more important by producers whose herd was PRRS positive or under a program. The producers identified visitors, air, manure, vehicles, wild animals and purchase of pigs as major routes of introduction of PRRSV in their herds.

Modelling mortality in cattle to assess the impact of the Bluetongue epidemic in France (2007-2009)

J-B. Perrin, C. Ducrot, J-L Vinard, E. Morignat, D. Calavas & P. Hendrikx

The impact on cattle mortality of the Bluetongue epizootic in Northern Europe (BTV8) since 2006 has not been precisely estimated. We analysed this impact at the population level, based on data gathered in the French National Cattle Register. We modelled the weekly fluctuations of mortality incidence rate in cattle from each French department from 2003 through 2006. Thanks to the fitted models, we computed the expected mortality from 2007 through 2009 by week, department, age group and production type. We compared the expected to the observed mortality and identified about 125 000 extra cattle deaths in France in 2008. Their spatiotemporal distribution suggests that most of them may be related to the Bluetongue epizootic.

Identification of risk factors in bovine tuberculosis: Contribution of molecular epidemiology

Marie-France Humblet, M. Gilbert, K. Walravens, Maryse Fauville-Dufaux, M. Govaerts & C. Saegerman

This study was designed to develop a model of analysis of space-time dynamics in bovine tuberculosis (bTB) possibly leading to a re-orientation of surveillance measures. A database compiling *Mycobacterium bovis* strains isolated between 1995 and 2006 was elaborated based on three molecular typing techniques. The classification of *M. bovis* strains allowed the identification of one predominant strain in Belgium. Several parameters or potential risk factors ($n = 49$) were tested using a multiple stepwise logistic regression. Two approaches were followed: the first considered all *M. bovis* strains (« All strains model ») whilst only the predominant lineage was included in the second approach (« Main strain model »). The “All strains” model identified the history of bTB in the herd ($P < 0.001$), the distance to a bTB outbreak (neighbouring effect) ($P < 0.001$) and cattle density ($P < 0.001$) as risk factors for bTB. The Main strain model highlighted the proportion of movements from an infected area during the current year as a major risk factor for bTB ($P = 0.007$). The present study allowed identifying several risk factors for bTB in Belgium thanks to an original methodology. Furthermore, the use of molecular biology seems useful to highlight differences in behaviour between *M. bovis* strains.

Semi-quantitative evaluation of the epidemiological surveillance network for highly pathogenic avian influenza in Mali

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This study presents a semi-quantitative evaluation of the organization and implementation of the EPIVET-Mali network (National veterinary epidemiological surveillance network in Mali) with regards to the surveillance of highly pathogenic avian influenza (HPAI). The methodology

used was very similar to that previously used within the PACE program and was based on field surveys and on an evaluation' grid including 28 criteria arranged by thematic components. EPIVET-Mali was assigned a satisfactory score of 3.05 out of 4 for the surveillance of HPAI. Some components operated particularly well (network organization, surveillance strategy, diagnostic laboratory and dissemination of information) whereas others obtained lower scores and were assigned recommendations for improvement (field functioning, network motivation, data management, and efficiency follow-up). Semi-quantitative evaluation methods for epidemiological surveillance networks provide valuable standardized user-friendly tools. They make it possible to identify the weak points in networks, draft recommendations for improvement and monitor the efficiency of corrective measures.

Comparison of two methods to estimate the characteristics of five serological tests for the diagnosis of porcine brucellosis

Anne Praud, O. Gimenez, Gina Zanella, Barbara Dufour, Nathalie Pozzi, Valérie Antras, Laurence Meyer & B. Garin-Bastuji

Serological tests are essential for surveillance of animal diseases and for control programs. Yet, to date, no gold standard is available for the diagnosis of porcine brucellosis. This study was designed to evaluate comparatively the sensitivity and specificity of five serological tests for porcine brucellosis using two approaches, a approach by analyse of frequencies (using the maximum likelihood method) and Bayesian modelling. The pig population tested included 6,422 animals in Metropolitan France and 1,595 in French Polynesia. Serum samples were subjected to five brucellosis serological tests: RBT, FPA, I-ELISA and two C-ELISA. Our study demonstrated that, in the absence of a gold standard, a Bayesian approach was to be preferred to evaluate the characteristics of serological tests. It also showed that sensitivity and specificity not only differ from one test to another, but may also vary depending on the epidemiological context.

Informative value of small pool samples to assess the status of dairy herds for *Mycobacterium avium* subsp. paratuberculosis infection

G. Roger, A. Joly, F. Beaudeau, R. Guatteo, H. Seegers & Christine Fourichon

This study was designed to evaluate the informative value of pool milk samples to determine the status of dairy herds regarding Paratuberculosis. In 55 dairy herds with a history of Paratuberculosis, various tests (ELISA, PCR and paraEM) were carried out on individual milk and faeces samples, as well as on pooled samples prepared in the laboratory. High sensitivity was obtained from ELISA tests on pooled milk samples and from PCR and paraEM tests on faeces samples collected in the environment or from young animals. Compared to conventional techniques requiring analyses of samples from all (individual animals), the proposed method leads to a considerable cost reduction with the same level of sensitivity.

Investigation of an outbreak of IBR in *Saône-et-Loire* using the algorithm Dijkstra

E. Petit, Elodie Pageot & J-P Christophe

Numerous and unusual IBR epizootics were reported in the Summer 2008 in some areas of *Saône-et-Loire* (France). That led to investigations by the GDS (Animal Health Farmers' Organization) in the affected herds to understand how the virus had succeeded in contaminating various sections of those herds while they were grazing. Dijkstra's algorithm was used to analyse those observations. It is based on navigation Software designed to find

the shortest ways from one point to another in a graph - in this case, the infected parts of the herds - and their links - the various transmission routes, such as proximity in the grazing areas, animals being moved and interventions on the animals. The investigation recorded all the transmission routes reported by cattle-breeders concerning the infected parts of their herds. Moreover, a software - developed with Excel - explored all the transmission routes that could account for the epizootic. The explanation rate of the contaminated part is of 35% and can rise up to 58% if one admits that the BTV vaccination is a way of transmission. A simulation on the date of the beginning of the epizootic shows that the epizootic may have started previously than the BTV epizootic and that it is not linked to an eventual viral reactivation which would have been provoked by the BTV epizootic, which started on those areas during summer 2008. The limitations of the investigations and of the method are discussed.

Detection by PCR of *Rickettsia felis* and *Wolbachia Sp* in lice and fleas of dogs and cats in Uganda

B. Davoust, O. Mediannikov, J. Acon, P. Parola & J-L. Marié

PCR was used to evidence *Rickettsia felis* and *Wolbachia pipientis* in fleas and lice infesting dogs and cats in Uganda. Since 76.5% of 155 fleas collected from domesticated animals contained DNA from *R. felis*, this bacterium has to be considered by local physicians in the diagnosis of human typhus-like syndrome in Uganda.

PAPER

First molecular characterization of *Mycobacterium bovis* and *Mycobacterium caprae* strains from Algeria by spoligotyping

Naima Sahraoui, B. Muller, D. Guetarni, Fadila Boulahbal, D. Yala, R. Ouzrout & J. Zinnstag

Bovine tuberculosis is prevalent in Algeria and causes highly significant losses. This study was carried out in two slaughterhouses in the northern part of Algeria. A total of 7 250 animals were examined. *Post mortem* inspection demonstrated tuberculosis-like lesions in 260 of these animals. Samples were collected from affected organs for culture, bacteriological examination and characterization by molecular typing techniques. One hundred and one bacterial strains were isolated from a total of 100 animals, 88 of these were identified as *M. bovis*; one was a strain of *M. caprae* (SB1451) and 12 were strains of other bacterial species. Spoligotyping of the 89 *Mycobacterium tuberculosis* complex strains revealed a total number of 23 different spoligotypes with two types (SB0120 and SB0121) being most frequently found and accounting for 39% and 21% of the strains isolated, respectively. Of the 23 spoligotype patterns observed, 18 types had been previously reported. The remaining 4 had not been described so far. Altogether, 88% of the *M. bovis* strains detected showed spoligotype patterns previously described in strains from France and some had also been detected in strains from other European countries. Our results suggest that the majority *M. bovis* strains identified in Algeria are of European origin.

INFORMATION

ERRATUM for issue 56 - Prevalence survey by immunological detection of bovine fasciolosis (*Fasciola gigantica*) in cattle raised by transhumant Peul herders, milk producers in the Region of the river Senegal in the north of the country.