## 1998, issue 34 - Abstracts

## RARE EVENTS SURVEILLANCE IN VETERINARY PUBLIC HEALTH. Meeting, 1998, May 14th

**Rare events surveillance in veterinary public health**
Toma (B)
This first paper recalls some classical notions (definitions), as well as the diversity of situations seen in the field of animal health (following the clinical and epidemiological aspects of the diseases to monitor). Two kinds of objectives and of strategies are recognized: quantitative objective for the estimation of the average frequency of a pathogen or a disease, and the qualitative objective of detection following a determined threshold. For rare events surveillance, the limits of classical strategies suggest to look towards oriented samples rather than random samples, screening tests applied to pooled samples and systematic control of positive results.

**Rare events surveillance. What strategies for what aims in foodstuffs hygiene and security?**
Merlin (P)
The presence, in foodstuffs, of microorganisms or of toxins, in quantities dangerous for consumers is a rare event, but, as the consequences may be serious it must be monitored. Surveillance schemes, oriented towards the evaluation of consumer's exposure to a health hazard must be applied to a representative sample of what is offered. Control schemes, oriented towards the detection of failures, so to take immediate measures, must be oriented towards specific products, at special risk of being out of standards. The control of a product batch to see if it is clear for consumption, must present a balance between a consumer risk and a producer risk. To evaluate a process or a society, the following of the chronological evolution of criteria on production representative samples is necessary.

**Methodological particularities of sampling in the cases of rare events**
Sanaa (M)
The aim of this paper is to recall basic notions of sampling and to present the limits of sampling in case of rare events. Two approaches can be recognized. The first one is quantitative and is directed to estimate the frequency of the event in a specific population. The second is qualitative and is oriented towards the detection of the presence of the event in a specific population. For the first approach the sample size is conversely proportional to the event frequency and the larger the precision wished is, the larger it is. To join reasonable sample sizes and so to be practicable on the field, the reasons to get a very precise result will have to be seriously discussed during the survey's plan phase. For the second approach, the quality of the sampling survey is evaluated following its capacity to detect the presence of the studied event. Two criteria are proposed: LAQ (level of acceptable quality) and LLQ (level of limit quality).

**How to control a chicken carcass batch coming from a Salmonella contaminated farm**
Salvat (G)
The slaughtering of poultry flocks when in a clinical stage of Salmonella leads to the question of the risk for public health linked to their commercialisation. This paper defines the acceptable sampling conditions to maintain the economic viability of the products and to prevent main hazards for public health. The respect of sampling process recommended by NF X 06-022 norm should allow to join these two aims.

**Critical analysis of BSE surveillance over the world**

Durand (B), Savey (M) & Moutou (F)

For many countries, to obtain and to conserve a free-BSE status is a question of great importance. The OIE international health code chapter dedicated to BSE is under elaboration. Preliminary versions make prevision for a surveillance system of the disease. We have considered three sampling strategies for BSE screening, with special attention to the global cost of the screening. The analysis shows the limits of any random sampling in order to certify that a country is he of BSE, and leads to prefer a passive targeted sampling strategy (which showed to be efficient in many European countries), and to think of complementary solutions.

**Critical study of pesticides surveillance in France**

Coulon (S)

At the European level, directives have been defining remnants maximum limits (RML) acceptable in foodstuff since 1988. They also oblige to organize a surveillance scheme for some foodstuffs. This is why, in France, surveillance and control schemes in foodstuff coming from animal products are organized yearly. The finding of pesticides in foodstuffs represents a rare event and this control is very expensive. If it is not too difficult to follow a specific population in case of anabolic steroid research, this is not the case to look for pesticides remnants as this mean a good knowledge of their use's habits in agriculture and in farming. This explains the practical and analytical difficulties linked to the surveillance of this rare event.

**Surveillance of rare health events: Example of bovine tuberculosis in France**

Benet (JJ)

Bovine tuberculosis is a rare event in France. Detection of infected herds by systematic skin test is recognized as criticisable (poor positive predictive value due to very low prevalence; low standardisation of human interpretation). Most infected herds (64 %) are detected by slaughter inspection (46 %) and others by screening tests before purchase (6 %), or by epidemiological investigation (12 %). This evolution reinforces a conception oriented towards risk factors control associated with surveillance of the control quality process.

**Methods to replace or complete surveillance by sampling in animal health**

Chillaud (T) & Bonjour (P)

When conducting surveillance for rarely occurring animal health problems, national sampling programmes do not always provide the most cost-effective solution. France, for instance, considering that swine produced in its commercial units are exempt from trichinellosis, has opted for systematic screening for the disease in only those carcasses likely to present a risk to consumers (equids and wild boar). On the other hand, an exporting country wishing to be recognised by importing countries as free from a disease as contagious as foot and mouth disease, needs to demonstrate this fact at the international level. Rather than trying to achieve this through surveys that are both costly and difficult to implement, it is preferable to submit to an evaluation procedure conducted under the auspices of the Office International des Epizooties aimed at verifying that it has undertaken all the necessary sanitary measures to prevent the disease occurring within its borders.

**Methods to replace or complete surveillance by sampling in food hygiene**

Mas (M) & Eynard (P)

Like those of the other sectors, the food industries implemented tools which enable them to guarantee a level of risk acceptable for the products that they put on the market. These methods were included

in the various European regulations, which currently impose to the food professionals the implementation of a system of risk monitoring during the process of manufacturing. This system can be inspired, and it is the most frequent case, of the HACCP (Hazard Analysis Critical Control Points) and its principles. After a short presentation of the HACCP system such as it is described in Codex Alimentarius, this article shows the advantages which the food industries can have to apply the risk assessment methods and to combine them with the control of critical points.

## APPLIED EPIDEMIOLOGY. Meeting, 1998, May 15th

**'*Infoporc*' network: From epidemiological survey to sanitary based management of Aujeszky's disease in Brittany**

Berthe (T)

The four first years of Aujeszky's Disease (AD) eradication plan in Brittany give interesting results. Nevertheless, due to the specificity of Brittany region, and first of all its high level of pig density, it becomes necessary to take further measures for a quicker eradication. Infoporc, a computer assisted system is designed to share sanitary information between all organisms dealing with pig movements, in order to separate qualified and unqualified circuits. A significant improvement in the efficiency of the eradication plan is expected, due to this better control of transmission risks.

**Vialine network: Evolution and recent results**

Camuset (P)

Started at the beginning of the 9Us, Vialine network evolved following scientific political and economic contingencies. The last evolution is Vialine sentinel veterinarians. This network proved the quick reaction capacity of veterinarian facing epizootic events. The data collected by this sentinel network concerned bovine diseases epidemiology, symptomatology and aetiology of paratuberculosis, listeriosis, salmonellosis, warble fly, infectious enzootic bronchopneumoniae, mortality and calving.

**Come back of veterinary experience from an outbreak of typhoid fever related to food**

Fajardi (V)

The appearance of several cases of typhoid fever in the Alpes-Maritimes department in September 1997 was the subject of a multidisciplinary inquiry which indicated that it involved a single outbreak with a spatio-temporal grouping of persons. It was statistically linked to the consumption of certain food (salami) which had apparently been subject to cross-contamination during preparation. This crisis enabled the Veterinary Services to draw a certain number of lessons, both technical and strategic, in the control of rare events.

**Equine rhodococcosis: Epidemiological approach. Evaluation of a three-year's survey in Normandy**

Fortier (G), Provost (S), Legendre (MF), Lecoutour (V) & Takai (S)

A three-year approach of equine rhodococcosis in Normandy brought us to use different methods of diagnosis and prevention of this severe pathology. Our first work was to use a total antibody's ELISA as a screening method in stud-farms or individual tool for confirmation diagnosis, especially for foals. Using a selective culture medium to isolate the bacteria on biological samples such as, dungs, soil or respiratory washes, we had the opportunity to survey the sensibility to antibiotics of bacterial strains in Normandy. Emergence of erythromycin resistant strains (10%) and of a new type of virulence plasmid could be a future care for prevention and treatment. The numerous analysis we made in studs with or without cases of rhodococcosis brought us to the same conclusions as describe previously [1, 6]. We have evaluated this risk from 1 to 5 and clearly saw that it was linearly correlated with the number of virulent strains of *Rhodococcus equi* on soil.

**Infectious bovine rhinotracheitis screening comparison between individual sera analysis and pooled sera analysis within the frame of the "IBR tested farm" (called "B") national label acquisition process**
Petit (E), Erimund (S), Blondet (M), Very (P) & Harly-Gerster (G)
Two hundred herds of *Côte-d'Or* and *Saône-et-Loire départements* were selected because they had IBR seropositive heads of cattle only older than 48 months. Within these herds, all cattle younger than 48 months were tested by a gB ELISA kit, first by 10 pooled sera, all negative, then by individual serology. ln this specific epidemiological context, 3,1 per thousand of cattle younger than 48 months, coming from negative pooled sera, were, however, positive at single sera. Nevertheless, additional analysis through other ELISA kits and sero-neutralisation, linked to epidemiological data, bring some doubt about the reality of the most part of these data. Different hypotheses are developed to explain the results differences observed between the two *départements*.

**A case-control study on the false positive serological reactions in bovine brucellosis in *Saône-et-Loire* (France)**
Pouillot (R), Lescoat (P), Batut-Gricourt (V), Garin-Bastuji (B), Benet (JJ) & Sanaa (M)
The objectives of this case-control study was to search for risk factors on the occurrence of false positive serological reactions in bovine brucellosis (FPSR), in Charolais herds of the *Saône-et-Loire département*. In spite of the weak power of the survey, three risk factors appeared significant through the multivariate analysis: the herb ensilage feeding (Odds ratio [O.R.] = 2.61, confidence interval 95 p. cent [C.1.95 p. cent]: 1.785.85), the presence of at least one dog (O. R. = 2.22, C.1.95 p. cent: 1.074.60), and the absence of sheep in the farm (0.R. =0.38, C.I=95 p. cent: 1.16-5.87). The statistical limits of such an investigation, as well as these results, are discussed.

## METHODOLOGY IN EPIDEMIOLOGY. Workshop, 1998, May 15th

**Study of factors influencing daily weight gain on young zebus in Garoua District, Cameroon: example of using mixed models in veterinary epidemiology**
Puyalto-Moussu (C), Sanaa (M), N'Djoya (A) & Planchenault (D)
The growth of young zebu was studied in 26 farm in Garoua District (North Cameroun) between January 1990 and January 1996. The farms were visited monthly and the growth rates of 551 calves aged between births to one year were measured. The calf variables were sex, race, parity and the season of birth. The farm variables were forage type, supplementation of the animals with cottonseed meal, the principle activity and age of the farmers (experience) and the size of his family. The association between explicative variables and weight gain were tested using mixed models, adapted for the analysis of correlated data corresponding to herd effect and repeated measurements of weight for a same animal. At last, results were compared to those obtained by simplified models (without herd random effect nor within-calf correlation).

**Predictive model for occurrence of clinical mastitis in dairy cows during successive lactations**
Gasqui (P) & Pons (O)
For a study of clinical mastitis count in dairy cows within a lactation, using the Poisson distribution is now classic. When the variable of interest is the interval between successive cases, it is also possible to use a classical survival model. Both models assume independent observations. The violation of this assumption results in over dispersion within a herd. The classic approaches do not provide satisfactory solutions to this problem. Our approach, based on a survival model and on a distribution mixture, allows to consider a "biological dependence" parameter between successive cases within a lactation, together with individual's factors and time-dependent covariates, the end of the lactation being a

censorship. The data of INRA experimental herds have been analysed with this approach. The prediction of the number of cases per lactation was compared to the observed number. The over dispersion disappears, it seems therefore explained essentially with this “biological dependence” parameter.

**Analysis of clustered data with binary outcomes: Giardia in dairy cattle**

Mohammed (HO), Wade (S) & Sanaa (M)

The purpose of this presentation was to illustrate the application of random-effect models to veterinary data and demonstrate the interpretation of the results obtained from such models. We used data that have a hierarchical structure to address the objective of this study. The data used have a two levels of nesting structure where information on risk factor were collected from individual animals that are grouped in herds and the herds were located in watersheds. In the analysis we modelled simultaneously the correlation at the first level of nesting among herds within a watershed and the second level of nesting between cows within a herd. With the use of an appropriate software, we were able to detect a significant intra-group correlation in the data and evaluate the impact of this correlation on the risk estimates.