2002, issue 41 – Abstracts
Special Issue: RISK ANALYSIS

Difficulties of surveillance and control of animal diseases throughout the world

J. Blancou

The author analyses the difficulties encountered by various countries throughout the world to ensure the collection, validation and dissemination of data relating to animal diseases occurring on their territory, as well as the financial, technical and human difficulties they must overcome to ensure the control of these diseases. He subsequently gives details of the difficulties encountered by international organisations in establishing a reliable global network for the collection and synthesis of national animal health data, and in setting up coordinated control programmes on animal diseases and zoonoses. He puts forward some suggestions to improve the current situation where trade in animals and animal products is hampered by the wide disparity in national animal health regulations.

Generalities on risk analysis

B. Toma, Barbara Dufour & M. Sanaa

This article supplies the necessary wording and presents the stages of a risk analysis as well as the main concepts for quantitative and qualitative approaches. It draws the attention on the importance of the determination of an acceptable risk, the central piece of any risk analysis because decisions ensuing from a risk analysis result from the comparison between the estimated risk and the acceptable risk.

Context of use of risk analysis: national, EEC, international

Catherine Rogy

The analysis of risks is henceforth an essential element for the preparation and the implementation of sanitary politics from governments. The dominating role of the obligation to scientifically justify measures within the framework of the WTO SPS agreement notably led them to set up strategies allowing them to have an evaluation of the high-risk level. In France as it is for other EEC authorities, the principle of separating the evaluation of risk and the management of the risk was adopted, with the creation of an independent structure only dedicated to the evaluation of risk. Although this approach could not be shared by all the member states of the European Union, it is jointly organised at the level of the EEC authorities with the creation of the European Food Safety Authority.

The precautionary principle

Barbara Dufour

The precautionary principle, appeared around ten years in the environment sector, quickly stood out as an obligatory management tool for the actors of the sanitary safety. The definitions of the precautionary principle, at first appeared in the international law then in the French law, indicating clearly that the precautionary principle is a management tool of the « potential risk » such as defined by Kourilsky and Vinney in their report sent to the Prime Minister. The field of application of the precautionary principle was originally the environmental domain; nevertheless, since the problems of contaminated blood, this method

of management widely became established all over the world sanitary facility, and a real “duty of precaution” did appear for the actors of the sanitary safety. Necessary tool for the management of the risks which treats only « turned out » risks, the precautionary principle is reassuring, it stimulates the research and facilitates the transparency of the methods of management. Nevertheless, it presents some pitfalls: risk of brake in the technological innovation, and limitation of the possibilities of estimating the effect of the decisions, but furthermore the precautionary principle presents a high economic cost and a risk of being excessively used by the decision-makers. In front of these risks, it is advisable to make a balanced application.

Qualitative approach of risk

Barbara Dufour & R. Pouillot

The risk analysis can be driven in a qualitative way or in a quantitative way. This article presents a qualitative method of approach. Various parameters, necessary for an estimation of the risk in the field of the sanitary safety for food and animal health further to the import of animals, are identified. The qualitative method proposed by Zepeda [Zepeda Sein, 1998] is presented and illustrated by two concrete examples: the risk of epizootic outbreaks of rinderpest in The Central African Republic during the introduction of animals, and that of the risk of introduction of the foot-and-mouth disease in Russia from the Caucasus. Advantages and inconveniences of the qualitative approach with regard to the quantitative approach are then discussed.

Quantitative approach of risk and collective expertise

Barbara Dufour, Anne-Marie Hattenberger & A. Martin

After a summary on the general concepts of the qualitative approach of the risk analysis as well as certain number of definitions, principles and data on the production of the expertise, the organization of the collective expertise in Afssa, its initial implementation and its current functioning are presented. The procedure of choice of the experts, the creation of committees, the procedure of expertise with the organization for the treatment of the referrals to a court received in Afssa, are described. The article evokes more particularly the implementation of more restricted working groups (six to eight experts) which, occurs frequently on the initiative of committees or on auto-referral to a court, when subjects requiring an important collection of data are handled to reassure the evaluation of the risk. All this work, collectively realised, driving the editorial staff to consider some parameters which, summarises the analysis and influencing the contents of the opinion, matched or not with the recommendations. The interest and the limits of the collective expertise for the appreciation of the risk are exposed. To answer the principles of competence, independence and transparency, the authors conclude that this collective expertise has to be framed by rigorous and pre-established principles within the framework of a quality method of the expertise.

Quantitative risk assessment: basic concepts

B. Toma

The quantitative evaluation of the risk implies to generate a quantified estimation of the risk, linked with its own degree of uncertainty. This paper presents the basic concepts to reach this level, in particular the notion of rate of immediate prevalence and a reminder of the organisation of probability clusters. Then we indicated the method estimating the probability of introduction of a pathogen by importing one animal or n animals. Some examples illustrate various basic situations.

Basic knowledge in the field of probability and statistics necessary for risk assessment

R. Pouillot & M. Sanaa

The production and the understanding of the results of a risk assessment require some minimal basic knowledge in the field of probability and statistics. This paper presents these observations. Examples and exercises in the field of importing alive animals are proposed.

Quantitative risk assessment: examples of deterministic approach

B. Toma, R. Pouillot & M. Sanaa

The deterministic approach of the quantitative evaluation of the risk is illustrated with two diseases; bovine tuberculosis and bovine brucellosis. The study of the first disease reaches a medium-range probability. Known dispersion values for several parameters related to the second disease show not only the usual medium-range probability but a highest and lowest possible probability as well. The analysis of the same disease by the probability method (see p. 111-120) allows to compare the results obtained with the same database by two different methods.

Theoretical basis of quantitative stochastic risk assessment

R. Pouillot, M. Sanaa & Barbara Dufour

The mathematical study of the risk probability (still called stochastic) is a procedure taking into account and estimating the variability of the risk and the uncertainty bound to its estimation. This paper presents the theoretical basis of this method and its interest compared with the punctual appreciation (still called determinist) in the field of the risks related to the import of alive animals. The general simulation, known as The Monte-Carlo evaluation, is explained as well as the interpretation of the obtained results. Finally, a further discussion on the second-class modelling, allowing to separate the uncertainty of the variation of the risk, is presented.

Definition of distribution of variables included in a quantitative risk assessment model

R. Pouillot

This paper presents some technical aspects to specify distributions from variables included in a quantitative risk assessment model linked to importation of live animals or food. Four major methods are described, according to the available data and the variable to model. Practical examples are proposed, and the main characteristics of the usual distribution used in this field of interest are recalled.

Quantitative risk assessment: example of use of the Monte-Carlo method of simulation

M. Sanaa, R. Pouillot & B. Toma

The use of the Monte Carlo method of simulation in quantitative appreciation of the risk is presented by means of an example on the bovine brucellosis treated in the article of B. Toma *et al*. [2002, p. 83-92].

Quantitative risk assessment of food borne diseases

M. Sanaa & O. Cerf

This paper considers the different steps of risk assessment and their application to food microbiology. Traditionally, quantitative risk assessment has been viewed simply as a method to estimate risk. However, when we conduct a complete risk assessment including different factors from "farm to fork" it can serve to understand the risk process. Quantitative risk assessment can also provide valuable insights as how to best manage the risk. The results of risk assessment depend on the pertinence and the quality of the data used. Data required to conduct risk assessment are unfortunately widely dispersed. The food industry, official regulatory agencies, consumer watch organizations, and the scientific community all have useful information for risk assessment. The lack of standard method to collect, process and diffuse data further complicates the problem.

Predictive microbiology: main models used in quantitative risk assessment

M. Sanaa

The modelling of the microbial growth is one of the key issues of the quantitative evaluation of the risks. Several types of models were analysed: the primary and secondary models, the industry-related models and the models under dynamic conditions of the environment. This paper presents the main characteristics of these various models.

Risk management: example of veterinary Services

D. Boisseleau

The management of the food risk is mainly insured by the veterinarian services of the State in our country. The Services are organized with levels establishing a hierarchical chain where the central level makes the strategic choices and the general organization, and the local level, the application. The perimeter of activity covers the domains of the animal health, the food hygiene and the environment and it "from the stable to the table". The risk management can take place in times of crisis or in thorough work: management of sanitary crises or watch and prevention. The risks are essentially bacteriological and chemical. Through examples pulled from health and hygiene data, the principles of organization of the management and the piloting of the actions are listed. The approach of the criteria of choice of the options of management shows that the approaches costs/profits have no sufficient place in our country.

Risk communication: main principles

P. Hupet

This article aims to point out general principles of communication process in the field of modern risks. First of all, we will suggest that the concept of « uncertainty » is intimately

connected with risk and decision-making process. In that respect, recognizing « uncertainty » within the sphere of public debate on risk issue could improve the social legitimacy of the decision. Second, we will see how social acceptability of uncertainties determines the ways of managing the risks. Eventually, we will stress the point that there is a necessary correlation between risk management strategy and effective risk communication program.

Juridical aspects of risk analysis

Y. Soyeux

The sanitary food safety knows a renewal of interest on behalf of authorities. In France and in Europe, it led to a reorganization of the risk assessment and the risk management, in the respect for rules governing the international trade. This evolution took place simultaneously in the consideration of the precautionary principle by the public decision-makers under the control of the community judge.